Structuring Sense
Hagit Borer’s three-volume work proposes a constructionist approach, driven by Universal Grammar, to the interfaces between morphology, syntax, and semantics and in doing so presents a fundamental reformulation of how language and grammar are structured in human minds and brains.

Volume I: In Name Only
Volume II: The Normal Course of Events
Volume III: Taking Form

‘Combining provocative theoretical insights and detailed empirical investigation, this third volume is a highly significant contribution to Hagit Borer’s grand project, developing an original and challenging conception of the nature of language that focuses on morphology but reaches far into fundamental considerations of syntax and semantics. Certain to be influential’

Noam Chomsky

‘Wide-ranging and intricately argued, this final volume in Borer’s monumental trilogy tackles the syntax of derived nominal in unprecedented depth and detail. This volume will be required reading for both syntacticians and morphologists for years to come’

Rochelle Lieber

Praise for the first two volumes

‘Syntacticians like Borer define the big research questions for the rest of us. Two provocative and inspiring books’

Angelika Kratzer

‘An excellent thought-provoking work by a great intellectual mind of the current linguistic world, written from a non-conventional perspective and challenging generative as well as lexical frameworks’

Linguist List
T’was [A brillig], and the [NP[A slithy]toves]
Did [V gyre] and [V gimble] in the [N wabe]:
All [A mimsy] were the [N borogoves],
And the [NP[A/N mome] raths] [V outgrabe]

Jabberwocky (annotated)
Lewis Carroll, Through the Looking Glass
Sometime during the summer of 1980 as I was pondering possible dissertation topics, and against the background of a surging interest, within generative linguistics, in comparative syntax, it occurred to me that language variation is not about central switches controlling major circuits, but rather about tinkering with very small screws controlling very small face plates; about making structures, broadly construed, fit into a rather narrowly defined inventory of connectors and joiners, defined, specifically, by grammatical formatives—as the terminology would have it at the time—and their formal properties. Rather central to my thinking, at the time, was my own experience as an L2 learner, as well as a better understanding of the rather neglected third type of operation proposed in Emonds (1976)—the Local Transformation.

The idea was hardly popular at the time, but I nonetheless pursued it as best I could, becoming, in the process, painfully aware of the absence of theoretical tools to properly deal with the class of items that I was foregrounding, as well as my own ignorance of the literature that had been attempting to make sense of the behavior of grammatical formatives—the morphological literature.

The research agenda thus conceived has remained the overriding force that has driven my inquiries in the past three decades. Setting aside the occasional love affairs with Subjects, with Control, and with Stylistic Inversion, my work on argument structure as well as my interest in nominal structure, as represented in Volumes I and II of Structuring Sense, all came about as matters that had to be understood before the core of the problem can be handled, the core of the problem having remained, tenaciously and consistently, a better understanding of formal joiners, however defined, and their relationship with structure and with syntax. In short, the subject matter typically described as “morphology”.

In turn, anyone who has seriously attempted to formalize morphology is woefully aware of how outstandingly difficult the task is. For one thing, there is no universal agreement on what the subject matter of the inquiry is. Is it attested words? Is it possible words? Is it productive processes? Is it lists? In fact, there isn’t even an agreement on what the intuitive notion “word” might correspond to, and whether there is such a formally coherent object that can be studied. Even beyond that, there is little agreement on what a morpheme is, a matter that this study is quite concerned with. At the core of the difficulty, I believe, there lies a fact that is hardly in dispute, but the significance of which remains elusive: during any language use situation, the majority of syntactic objects are formed on the fly and are phonologically realized and semantically composed and interpreted as such. By contrast, the majority of (complex) “words” appear to be pulled from a list, where they are stored together with their phonology and their meaning. But why should that be so, and what other differences does this fact correspond to? The resolution of the matter is hardly made easier by the fact that some syntactic objects are clearly listed (e.g. phrasal idioms), and “words” certainly can be formed on the fly and routinely are. As a result, it cannot
be taken for granted that the distinction between listedness and on-the-fly, when attested, signals fundamentally distinct formal systems. It nonetheless remains the case that because so many “words” are listed in some sense, and because listing, by its nature, is more tolerant of idiosyncrasies, any generalizations concerning the formal properties of “words” as well as their construction and their sub-units remain extraordinarily slippery.

During the three decades that I have been attempting to gain some foothold on these slippery grounds, my own thinking on the subject matter has undergone important changes, the culmination of which is in the conviction that there is little reason to segregate the formation of complex words and the formation of complex phrases, a conviction which I attempt to make explicit in this rather hefty volume. The final result remains, nonetheless, incomplete in crucial ways. It is riddled with acknowledged open issues and with tentative results, and peppered with junctures at which further research is clearly called for. Nor have I attempted to go far beyond the boundaries of English morphology (with some side detours to Semitic), or to cover, even within English, the full array of relevant facts (thus “inflection” and compounds are only scantily addressed, and argument-structure changing morphology altogether set aside). I do believe, however, that the work represents a step forward, and little more, truly, can be hoped for in any body of scientific work.

Commensurate with the increase in my own knowledge of morphology and morphological matters, my respect for previously gained morphological knowledge, indeed, my ability to appreciate it and learn from it, have grown tremendously. Any reader of this book cannot fail to recognize the fundamental impact on my morphological thinking that comes from that of Steve Anderson, Mark Aronoff, Noam Chomsky, David Embick, Morris Halle, Paul Kiparsky, Rochelle Lieber, Alec Marantz, Lisa Selkirk, and Edwin Williams. Other major intellectual debt is owed to Peter Ackema, Maya Arad, Mark Baker, Robert Beard, Anna-Maria Di Sciullo, Joe Emonds, Heidi Harley, Ray Jackendoff, Jean Lowenstamm, Ad Neeleman, Tom Roeper, and Pavol Štekauer.

The empirical core of this book consists of a study of derived nominals. The profound impact on my understanding of these constructions that originates with Jane Grimshaw’s work should be self-evident. I have gained much additional insight in attempting to understand these constructions from the work of Artemis Alexiadou, Noam Chomsky (again!), Ilan Hazout, Angeliek van Hout, Alec Marantz (again!), Isabelle Roy, Tom Roeper (again!), Bożena Rozwadowska, and Tal Siloni.

Finally, my attempts to make sense of Semitic morphology owe substantial debt to previous work of Maya Arad (again!), Outi Bat-El, Shmuel Bolotsky, Edit Doron, Noam Faust, Jean Lowenstamm (again!), John McCarthy, and Alan Prince.

During the many years that I have been attempting to cut a path through the morphological jungle I have benefited tremendously from input from colleagues and students. For outstandingly insightful discussions and comments I would like to thank audiences of seminars and talks primarily at the University of Southern California, at Stuttgart University, at Seoul University, at LISSIM IV, and at Abralin, as well as Peter Ackema, Paulo Acquaviva, David Adger, Artemis Alexiadou, Elena Anagnostopoulou, Marijke De Belder, Marcel den Dikken, Edit Doron, David
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During the five years or so that I have been writing this book, my own life has undergone major changes. The world, likewise, is not the same place it was when I first became ensconced in the comfort of this project. As I am emerging from this particular ivory tower into an altogether harsher world, wishing for a just world seems rather unrealistic, but nonetheless a hope to hold on to. I would thus like to dedicate this book to all those in Palestine and outside of it who continue to struggle, tirelessly, against the Israeli occupation and for peace with justice in the Middle East.

HB

London, April 2012
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√

root general use (not necessarily as a phonological index)

π√xyz

root, specifically as a phonological index

/πxyz/

reference to an actual phonological realization (phonetically accurate representations not attempted)

⟨e⟩

open value, in need of range assignment

⟨X^{MN}⟩_B

value-assigned head within a head pair. Examples: [PST ⟨V^{PST}⟩_T]; [FUT ⟨e^{FUT}⟩_T]

{Ex [X]}

the set of ExP-segments that make up the Extended Projection that takes the category X as its CCS

AS-nominals

Argument Structure Nominals (roughly Grimshaw’s Complex Event Nominals)

ASP_Q

telicity (quantity) inducing ExP-segment, member of {Ex [V]}

ATK

“ation and kin”: the set of phonological realizations associated with the C-functor, C_{N[V]} in English: -ation, -ance, -ence, -ancy, -ency, -ment, -al (possibly also -age). Does not include -ing.

binyan

in Semitic languages, morphological template, guiding the arrangement and the vocalization of root radicals; verbal

C

“lexical” category (V, N, A; possibly ADV and P)

C-core

the C-component dominated by {Ex [C]} (see definition in Ch. 6, section 3)

CCS

Categorial Complement Space

C-functors

categorial functions; C_{N[X]}

C_{N[X]}, C_{X[Y]}

C-functor which projects X and takes Y as its CCS and which is phonologically realized as /πxyz/

C=X

C-equivalent (i.e. a constituent without an inherent categorial label occupying a categorial space otherwise reserved for X-labeled constituents), e.g. the [C=N√form]

DM

Distributed Morphology Model

E

an event structure ExP-segment, member of {Ex [V]}; may license an Originator interpretation

ExP

Extended Projection; {Ex [X]}

ExP-segments

segments of Extended Projections (e.g. for a verbal Extended Projection, T, g-asp, asp, and so on); abbr. ExS

ExS

ExP-segment

F^{SHL}

Shell F; semantically vacuous ExP-segment

(G)

corpus-based example, Google search
G-ASP grammatical aspect (viewpoint aspect), an ExP-segment (distinct from event-structure aspectual nodes such as ASPQ and E)

Head Pair the grouping of SX and the open value to which it assigns semantic range

LOH The Level Ordering Hypothesis

LPM Lexical Phonology and Morphology

mīsqal Semitic morphological template, guiding the arrangement and the vocalization of root radicals; nominal

Originator event-participant role; roughly an internal causer

P-RaD a (well-defined) phonological rule application domain; in English and Hebrew, that of primary stress

P-Voice ExP-segment, member of [Ex [V]], responsible for passive voice (abbr. P-Vc)

Q-nominals Quality nominals; de-adjectival nominals which do not embed (stative) event structure

R-nominals derived nominals which do not embed event structure

S-functors semantic range assignors to open values; also SX

Shell F semantically vacuous member of {Ex [X]} (F(SHL))

S-marking the phonological realization of a value assigned to ∋e when occupied by C; example: ∋V PST ∋π √ xyz p-vc, pst

S-nominals state nominals; de-adjectival nominals with an embedded stative event structure

SX an S-functor with the semantic range S, to be assigned to an open value which, as a consequence, becomes of categorial type X; example: [THE D ∋e] → [THE D ∋e THE D]

X an X projection (either min or max, unless otherwise specified)

XP X max; with the exception of DP, always notated as such, maximal and minimal instantiations of categories are only marked as such when salient

XS, XSM Exo-Skeletal Model

Orthographic Conventions

abc.def phonological marking which does not entail a constituent boundary (e.g. in this system, dog.s)

abc-def constituent boundary within a phonological string (e.g. transform-ation)

Italics (lower case) informal reference

Shaded bold gray silent copies (e.g. [α[α[C→V π√CATCH] ABLE] [C→V π√CATCH]])

Upper case Functors (e.g. THE, MOST, ABLE)

Upper case, italics Content (e.g. CAT, DOG, CAR GEARBOX)

SpecX Specifier of X
A Note on Hebrew Transcription

The pronunciation of biblical texts was codified in the 10th century by the Tiberian School by means of adding diacritics to what was, previously, an unvocalized text. While some syntactic and morphological information concerning Biblical Hebrew is clearly discernible from the texts as they predate that time, other information, including vowel quality and gemination, is not encoded directly in earlier texts. Phonological information concerning the pronunciation of Rabbinical (or Mishnaic) Hebrew (as well as Aramaic) was likewise incomplete. In this book, Tiberian Hebrew is the term used whenever statements are made which concern phonological aspects of Hebrew that were codified by the Tiberian School. Biblical Hebrew, when the term is used, rather refers to those aspects of Hebrew (e.g. the aspectual system, prefixation, suffixation, and so on) which can be unambiguously discerned from older, non-vocalized texts, and specifically, texts which predate the important linguistic changes that Hebrew underwent roughly from the 6th century BCE onwards, and which by 200 BCE gave rise to texts classified as Rabbinical Hebrew. Of the many important changes, some of relevance are the reanalysis of the aspectual perfective/imperfective system as tense (past/future, respectively), and the change of word order from VSO to SVO, accompanied by a fuller agreement on the verb.

Syntactically, Modern Hebrew (MH) is a descendent of Rabbinical Hebrew, via Medieval Hebrew. Phonologically, on the other hand, it is clearly distinct from Tiberian Hebrew as well as from Medieval Hebrew (used throughout the Mediterranean basin). It is further phonologically distinct from all recorded (and distinct) vocalizations of Hebrew that existed well into the 20th century, both in Europe and throughout the Mediterranean basin, the Middle East, and the Arabian Peninsula. Interestingly, but rather non-surprisingly, the greatest historical linguistic continuity is morphological, with the template system of Biblical Hebrew, Rabbinical Hebrew, and Modern Hebrew being virtually identical. One important area of potential difference, however, emerges precisely from the distinct phonology of Modern Hebrew. In Tiberian Hebrew, binyanim III and VII (as well as IV, the internal passive of III) involve the gemination of the middle radical. Also of some importance is the gemination, for binyan II, of the first root consonant in the imperfective, typically taken to indicate an assimilation of the n-prefix associated with that binyan. In Modern Hebrew, however, gemination is altogether phonetically absent, raising the legitimate question of whether the relevant binyanim have been reanalyzed and the relevant binyan-specific gemination altogether gone. The matter is not a simple one, because although gemination, as such, is never directly in evidence, arguably it is present in some abstract form nonetheless, thereby accounting both for the failure of post-vocalic spirantization of the middle radical in III/IV (when compared with I, cf. (1)) as well as for the overwhelming friendliness of III and VII templates towards
quadro-radical roots (cf. (2)), or the different patterns of reduplication in bi-radical roots as in (3):

(1) ROOT: $\sqrt{?BD}$
   I: $\bar{b}\bar{a}\bar{d}$
   III: $\bar{t}\bar{i}\bar{b}\bar{b}\bar{d}$
   Tiberian H: $[\bar{a}\bar{v}\bar{a}\bar{d}]$
   Modern H: $[a\bar{v}\bar{a}d]\ 'work''$
   ‘work’
   ‘cultivate’

(2) ROOT: $\sqrt{TRGM }$ ($^{*I,II,IV}$)
   III: tirgem
   VII: hittragem
   ‘translate.TRANS’
   ‘translate.INTRANS’
   (MH pronunciation: $[hi\text{ttragem}]$)

(3) ROOT: $\sqrt{BZ}$
   a. I: i $\bar{b}\bar{a}\bar{z}$ ii $\bar{b}\bar{a}\bar{z}\bar{a}\bar{z}$
   ‘rob’
   ‘rob’
   b. III: $\bar{b}\bar{i}\bar{z}\bar{b}\bar{e}\bar{z}$
   VII: $[h\text{i}\bar{t}\bar{b}\bar{a}\bar{z}\bar{b}\bar{e}\bar{z}]$
   ‘waste.TRANS’
   ‘waste.INTRANS’

Seeking to characterize what is common to the different stages of the language (or to the languages, for that matter) and attempting to make morpho-phonological relatedness as transparent as possible, I have opted to represent III, IV, and VII, as well as imperfective forms of II, throughout, as involving gemination, thereby allowing the discussion to proceed on the basis of the morphological data available, uniformly, in all accessible historical periods in which the morphological system appears, otherwise, fundamentally the same. A similar rationale dictates the decision to phonologically represent at least some of the root radicals as they are phonologically encoded in Tiberian Hebrew—and by assumption in Biblical Hebrew as well (to judge on the basis of orthographic distinctions)—even when the relevant phonological distinctions have become obscured in Modern Hebrew, insofar as such radicals continue to inform phonological processes, especially when guttural and pharyngeal, which would otherwise be difficult to describe. We note that the biggest phonological distinction between Tiberian Hebrew and Modern Hebrew involves the loss of vowel length distinctions in the latter, a matter that goes unrepresented in this work altogether, where vowel length in Hebrew goes unmarked across the board, thus corresponding to Modern Hebrew pronunciation. I further opted not to represent gemination outside the verbal system or orthographically existing but phonetically absent distinctions in borrowed forms. In general, and although I do subscribe to the view that Modern Hebrew phonology must have retained abstract distinctions that are no longer directly pronounced, transcription decisions were made primarily based on ease of exposition, and theoretical phonological claims are by and large not intended. Theoretical claims are at times made in this text that do impact phonological representations. When that is the case, these claims are explicitly articulated in the discussion.

Finally, Tiberian Hebrew has a spirantization rule which affects non-emphatic stops post-vocally, and which is bled by gemination, and thus $[b,p,d,t,g,k] \rightarrow [v,f,\theta,\dot{\theta},\epsilon,\tau,\chi]$. Of these, MH observes only $[b,p,k] \rightarrow [v,f,\epsilon,\chi]$, the sounds $[\theta,\dot{\theta},\epsilon]$ having altogether vanished from the language, and in two of these cases $[v,\epsilon,\chi]$, the output of such
spirantization renders it indistinct from consonants that are otherwise attested in the language and which are not derived (the erstwhile [w] in Tiberian Hebrew now pronounced [v], and the erstwhile [h] now pronounced as [x]). Throughout this work, and again guided by expositional considerations, spirantization remains unmarked (unless relevant), given the fact that by assumption, it has little if any effect on the phenomena under consideration. For more specific clarifications in relevant contexts, see footnotes in Chapter 11. The table in (4) is a representation of the transcription notations used relative to the Hebrew alphabet. Here, and throughout this text, quotative forms for verbs are perfective.3.sg.m. All glosses of quotative forms in isolation, however, abstract away from tense/aspect/agreement markers:

(4) Transcription, Hebrew Consonants

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<th>Transcription</th>
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<td>A</td>
<td>[']</td>
<td>[']; ∅</td>
<td>(word initially and root radical); ∅ otherwise</td>
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<td>[h]; ∅</td>
<td>∅ word-final; h (otherwise and root radical)</td>
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A Note on Hebrew Transcription
Introduction—Words? What Words?

1.1 Introduction

This book is the third in an ongoing investigation of the interaction between syntax and words. In its two predecessors, I developed a model which I named the Exo-Skeletal Model (XS Model), in which all grammatical (non-phonological) properties are computed on the basis of syntactic structure in conjunction with syntactically merged semantic operators. Insofar as XS, like any structuralist approach to language, must assume a list of some sort—at the very minimum linking some arbitrary sign (sound, gesture) with some conceptual meaning, or Content—I explicitly assumed that neither the sign component nor the (conceptual) Content component—nor, indeed, the pairing of the two—can inform the construction of syntactic or formal semantic structure in any way. XS, then, challenges claims made at least as early as Chomsky (1965), according to which the listing of substantive Content units comes with a set of diacritics which are, effectively, a set of instructions to the syntax. At their most developed incarnation, such list-, or lexicon-based models translated into the claim that syntactic structure is largely the trivial output of the combination of lexically encoded instructions with general principles which guide the construction of hierarchical constituent structure (e.g. X’-theory). Such is, broadly described, the system developed in various versions of Lexical Functional Grammar as well as many aspects of the system developed in (early) Government and Binding, where it is explicitly assumed that D-Structure is GFtheta—the direct result of composing lexically specified grammatical information with X’-theory. Models which endorse the central grammatical role of listed units may vary substantially concerning not only the scope and the formal nature of the diacritics under consideration, but also the extent to which formal operations may affect them and thus affect the output to hierarchical syntax. They do, however, share the substantial claim that listed Content units, however otherwise described, have properties which can inform both syntactic structures and formal-semantic operations, although they are not derived syntactically or semantically. Most broadly, all these models share the assumption that listed Content units come with a category label (noun, verb, 

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1 The separation of Content from elements of formal semantics thus appeals to Frege’s distinction between Sinn and Bedeutung, in turn supplemented by the explicit claim that the former is grammatically inert.
adjective, and so on), and that they come with some instructions concerning their insertion frame—be it subcategorization, a configuration of thematic role assignments, lexical semantics which guides the formation of predicate-argument structure, or some other equivalent systems. To illustrate, the fact that e.g. *table* is listed as a noun (as a count noun, specifically), makes its merger licit, licenses it, so to speak, in the context of determiners, in the context of plural marking and cardinals and so on. The fact that *kick* is listed as a verb with two participants of a particular ilk, allows it not only to occur with tense, but also to occur with a direct object and a subject with a particular interpretation, and specifically in a structure in which the subject c-commands the object.

Presumably, in any account, something must be said about the syntax such that it would account for the occurrence of *table* in the context of *the*, and for the occurrence and interpretation of *walked the dog*. The challenge that systems such as XS and similar thus face is the modeling of a sufficiently restricted grammar which can adequately describe these effects without availing itself of information listed in conjunction with substantive Content units. This is the task I undertook in *In Name Only* and in *The Normal Course of Events*, the first elaborating on the construction of nominal constituents, and the second on the construction of event structure, all without recourse to information listed with Content units.

At the core of the theoretical approach, however, there remains an important matter which is in need of a thorough investigation. Thus far, the XS investigation of e.g. *the table* or *walked the dog* proceeded from a starting point that the formal (non-phonological) properties of such expressions can be fully accommodated without availing ourselves, at any point, of information which is uniquely connected with *table*, *walk*, and *dog*, respectively. Rather, both the syntax and crucial aspects of the formal semantics can be computed on the basis of the syntactic structure of functors and the semantic formulas which such functors name; in this case, the functors that we can refer to, informally, as THE and PAST. As a result, the investigation focused little on the actual properties of *table*, *walk*, and *dog*. What, however, are *table*, *walk*, and *dog*? The matter is important in two rather distinct ways. First, *table*, *walk*, and *dog* do come to be associated with some Content. Even if such Content may be inert syntactically and in formal-semantic terms, it nonetheless does get associated with these expressions at some point, and a full language description must take account of that fact. More important from a grammatical perspective, however, is the question of what the specifically grammatical properties of *table*, *walk*, and *dog* are. For instance, do they have a syntactic category? Do they have a syntactic category in isolation? Do they have a syntactic category within a larger syntactic constituent? Is that syntactic category constant across their occurrences? And finally, given that by assumption in XS they are not listed with such a category, if they do come to have one, how do they come to have it? Similarly, and assuming *table*, *walk*, and *dog*, at the very minimum, correspond to some phonological representation, what is this phonological representation associated with? Some atomic units, call them *table*, *walk*, *dog*? Some derived unit, created from combining more than a single constituent? If the former, we must now address the question of what *table*, *walk*, and
*dog* are, such that they are linked to a phonological representation. If the latter, we must determine what the larger unit under consideration is, such that it would be assigned the relevant phonology, and ask whether it is the same across all the relevant phonological occurrences of *table*, *walk*, and *dog*.

Crucially, note that, at least as phonological strings, *table*, *walk*, and *dog* must be dissociated from any syntactic information, for the very same phonological string may occur as both noun and verb. Hence *the table* but to *table a motion*; *walked the dog* but also *the walk to the hills*, and it’s not nice to *dog people like that* and so on. In Borer (2005a, b) I conclude that the best way to handle this fact is by assuming that in and of themselves, *table*, *walk*, and *dog*, whatever they turn out to be, do not have a category, and that their verbal or nominal instantiation is dependent on their syntactic context (a matter I return to in Chapter 7). If on the right track, this provides at least one answer to the set of questions above, insofar as *table*, *walk*, and *dog*, if atoms, have no syntactic category, thereby allowing them to occur in a multitude of syntactic contexts.

But if so, then even these relatively simple cases already raise a number of puzzles. First, while one may concur that *table*, *walk*, *dog* are not (atomically) syntactic units, this hardly provides an answer to the question of what they are. Second, while *dog* (or *table*) may certainly occur in both verbal and nominal contexts, the Content of *dog* (henceforth *DOG* or *TABLE*) in these different contexts is quite different. While certainly the verbal Content can be related to some properties of the nominal Content, the Content relation is not a deterministic one. While *to dog* in English means to pursue tenaciously to the point of harassment, it could have, presumably, picked up on some other canonical property of domestic canines to end up with a Content such as *to be loyal*, or *to follow scent*. *Table*, as a verb in English, actually has two diametrically opposite readings—one means to submit a motion (presumably, metaphorically, put it on the table), the other to postpone its submission, further illustrating the failure of deterministic Content relations to occur. Nor should this come as a surprise. “Words” do acquire unpredictable Content, and such unpredictable Content is frequently associated with categorial polarizing. This, after all, is one of the reasons for the powerful hypothesis that words are listed in some sense that phrases are not. The question for an XS-type approach, then, becomes how to represent such unpredictable Content in a system where, to begin with, it is not entirely clear what *dog* or *table* are, altogether. To the extent that there are such entities that we can refer to as *dog* or *table*, do they have Content? Do we expect this Content to be constant across all their occurrences? Do we expect such Content to be modified when they are in nominal or verbal contexts, and how can we model such modification of Content? And are there any limits on the ways in which such Content can be modified?

The matter acquires additional complexity when we consider ‘complex’ words such as *transformation* or *globalize*. If one could argue that in isolation *table* and *walk* do not have a category, a similar claim concerning *transformation* or *globalize* seems rather dubious. *The globalize* or *transformationed the committees* are clearly ungrammatical, representing what can probably be otherwise demonstrated rather
amply, which is that English derivational suffixes correspond to categorially marked constituents. If, however, one subscribes to a model in which only structures and functors have formal properties but never listed Content items as such, then the inevitable conclusion is that globalize and transformation cannot be “listed Content items” and must have a structure and may contain functors. While, presumably, the compositional operations that give rise to globalize might still be distinct from those that give rise to in the park, note that by assumption, the output of globalize cannot be listed (in the relevant sense) any more than the output of in the park. More accurately, insofar as by assumption the construction of the grammar is oblivious to the properties of Content units, even if some component were to list globalize, the fact that it is listed as a verb cannot be syntactically “checked” any more than the fact that dog, presumably, is not. In view of this, one is driven to question the advantages of an independent component which derives forms such as globalize, given that not only the internal structure, but also the output of such a component would be syntactically inert.

Suppose, then, we assume instead that there may be exactly one (non-phonological) hierarchy-forming computational device which utilizes identical formal operations when it constructs globalize and in the park. But then, the question we already faced relative to the verbal and nominal instantiations of table and dog becomes even trickier—transformation, presumably, is ambiguous between a Content that can, broadly speaking, be paraphrased as “the act of transforming”, and a Content that, broadly speaking, can be paraphrased as “a particular formal operation on a grammatical representation”. The former, but not the latter, has an interpretation fully predictable from the Content of the verb within it, plus whatever contribution comes in from -ation, say “action”. The latter still has the “action” component to it, sure enough, but the verb embedded within it, transform, does not share the technical Content that is associated with the nominal (to wit I performed a transformation on this structure to derive this word order ≠ I transformed this structure to derive this word order). Certainly, insofar as the technical Content of transformation is not predictable from its parts, that Content needs to be listed. But how can such listing be accommodated within a fundamentally syntactic approach to the formation of complex words such as transformation? And why list transformation, but not in the park?

Attempting to phrase the question here in the broadest terms, and abstracting away from formal functors, an utterance in Natural Language is typically associated—directly or derivatively—with some syntactic information, some phonological information and some Content information. Presumably, each of these modules defines within the terms of its own formal language units of various size. Within syntax, we can assume the minimally sized unit to be a category (where by category I specifically refer to so-called lexical categories, i.e. N, V, A, possibly Adv, and some instances of P). I will take Content, or conceptual Content, here to refer to aspects of meaning which are not rigid designators (in the technical sense, as defined later in the chapter), and which, broadly, correspond to conceptual knowledge, however structured. I will also assume that conceptual knowledge is internally organized in ways
which determine what is, or what isn’t, an appropriate unit of Content.\textsuperscript{2} For phonology, I will by and large assume that neither a segment nor a syllable (or a foot) as such define domains in the relevant sense. In a language such as English, rather, the minimal domain would turn out to be that which coincides with the innermost phonological cycle and which contains no internal boundaries (and see below, section 1.4, for a more precise description). The question under consideration here, then, is what is the relationship between these different module-specific units? Suppose we assume now, as is reasonable, that e.g. /\textipa{\textpi dog}/ is a minimal phonological unit insofar as it defines a single cycle.\textsuperscript{3} The concrete question then becomes what the relationship is between /\textipa{\textpi dog}/, \([N…\text{dog}…]\) and \(\text{DOG(ANIMAL)}\), and to what extent it overlaps with the relationship between /\textipa{\textpi dog}/, \([V…\text{dog}…]\) and \(\text{DOG(HARASS)}\):

\[
(1) \quad \begin{array}{c}
\text{\textipa{\textpi dog}} \\
\begin{array}{c}
N…\text{dog}… \\
V…\text{dog}…
\end{array}
\end{array}
\quad \begin{array}{c}
\text{DOG(ANIMAL)} \\
\text{DOG(HARASS)}
\end{array}
\]

In principle, any relationship is possible between any of the objects in (1) and in any direction, although, presumably, some are less plausible than others. There is no prima facie expectation, we note, for these minimal units to correspond to each other. It is certainly perfectly plausible, formally, for them to go their separate ways, so that, for example, a minimal syntactic category, say \(N\), would nonetheless correspond to multiple possible PH (=phonological) realizations, some minimal and some not; similarly, it would be possible for a single Content unit, say \(\text{DIE}\), to correspond to a complex syntactic constituent as well as a non-minimal PH unit, and for a single PH unit to correspond to a complex syntactic constituent or complex Content, say /\textipa{\textpi kill}/ if we assume that \textit{kill} is indeed complex, in some sense. In turn, some of these degrees of complexity may be derived from one another or alternatively correlate with each other symmetrically in some meaningful way. The matter, ultimately, is an empirical one.

Within generative grammar, and for the past forty years or so, there has been one dominant answer to this question—the lexicalist answer, according to which phonological, syntactic, and Content properties are all associated with listed items which we may refer to as “words”. As the purpose of the present work is to challenge this answer, it is worthwhile to embark upon a brief historical review of its emergence and its justifications.

\textsuperscript{2} The question receives massive attention in the philosophical literature, which I will not attempt to summarize. Most notably, see Quine (1966) and much follow-up discussion.

\textsuperscript{3} Material enclosed in slashes with a \(\textipa{\textpi}\) (/\textipa{\textpi xyz}/) is in reference to some appropriate phonological representation. Actual phonological representations are largely not attempted. Italicized capitals indicate (conceptual) Content. See the glossary at the start of the book for a full list of notational conventions and abbreviations.
1.2 The Remarks Challenge

In 1967, in Remarks on Nominalization (published 1970), in a move that was as controversial as it was influential, Chomsky proposed that certain operations of word formation, previously assumed to be within the jurisdiction of the syntax, were to be moved to the lexicon, a specifically non-generative component of the grammar. As such, their properties were assumed to be on a par with other listed properties such as subcategorization, selectional restrictions, category specification, and phonological properties, many already proposed to reside in the lexicon in Chomsky (1965). The primary rationale for moving the relationship which holds between e.g. destroy and destruction to the lexicon was twofold. On the one hand, it was heuristic. Syntactic derivations of de-verbal nominals, and of complex words in general, proved extremely detrimental to attempts to formally constrain the syntax along more universal lines, a disadvantage that was, in fact, to lead to the formal collapse of those syntactic models which rejected the Remarks move. Moving word structure and word properties to the lexicon, on the other hand, allowed the development of a more constrained syntax precisely within those sub-areas of grammar for which progress could be most beneficially made at the time.

The second rationale for moving complex-word internal properties to the lexicon was formal. Chomsky (1970) puts forth a series of arguments designed to show that the formation of words, however achieved, is not a generative device, but rather must avail itself of lexically listed information. The lexicon, thus extended, was specifically targeted as the locus not only of idiosyncratic information associated with individual words, but also as the locus of relationships between pairs of related words, by assumption potentially arbitrary and unpredictable.

Reasoning on the basis of a detailed comparison between complex nominals arguably derived from verbs, and gerunds, Chomsky constructs a typology of syntactic vs. lexical operations. Thus he points out that while gerunds are entirely regular and predictably share the properties of the verbs embedded within them, that is not the case for de-verbal nominals, where both interpretational and syntactic idiosyncrasies are common, and where the systematic inheritance of verbal properties cannot be taken for granted. The appropriate insertion of de-verbal nominals into syntactic structures, i.e. their present-day merger, Chomsky reasons, must avail itself of unpredictable listed information, thereby necessitating their removal from the syntax and their listing, leading to an enrichment of the lexicon.

Chomsky (1970) does note, however, that alongside potential idiosyncrasies, de-verbal nominals are frequently systematically related to their verbal source, to wit, destroy and destruction, defer and deferral, and so on. To capture these regularities, he introduces X’-theory, within which a pair such as destroy/destruction can be perceived as a single category-less entry with a fixed subcategorization frame. This entry, in turn, may be inserted under an X0, be it N0 or V0. In turn, the syntactic context of the insertion determines the phonologically appropriate form for the entry. If inserted under N, it would be pronounced deferral or destruction. If, on the other hand, it is
inserted under $V$ it would be pronounced *defer* or *destroy*.\textsuperscript{4} Given the provisions of the $X'$-scheme as suggested at the time, subcategorization relationships which hold between an entry and its complement may be constant across categorial instantiations.\textsuperscript{5} Crucially for this execution, whatever operation relates *destroy*, as the verbal instantiation of the relevant entry, and *destruction*, its nominal instantiation, it is not syntactic and is not represented syntactically. In fact, within that approach, it is not clear that the relationship is derivational in nature altogether, as opposed to constituting a salient statistical correlation, an approach explicitly put forward by Jackendoff (1975). The Remarks-model structure of *destroy* vs. *destruction* can thus be represented as in (2) (irrelevant details omitted), where *destroy* is an entry presumably marked by some Content as well as by subcategorization and possibly other properties, but not syntactic category:

\begin{equation}
\begin{array}{c}
N' \\
\text{(of NP)}
\end{array}
\begin{array}{c}
V'
\end{array}
\end{equation}

\begin{equation}
\begin{array}{c}
\text{DESTROY} \rightarrow /\pi\text{destruction}/
\end{array}
\begin{array}{c}
\text{DESTROY} \rightarrow /\pi\text{destroy}/
\end{array}
\end{equation}

A number of crucial properties of (2) are worth highlighting. First, note that the complement of the noun is optional, but that of the verb is obligatory. Chomsky (1970) assumes, explicitly, that this is a structural difference between nouns and verbs, which spans both the object and the subject, the latter optional for nouns and obligatory for verbs as well. In fact, the correlation between the optionality of complements in de-verbal nominals and the optionality of complements in non-de-verbal nominals serves for Chomsky as an additional argument for the lexically rather than (syntactically) derived nature of de-verbal nominals. To wit, if de-verbal nominals have a verb embedded under them, one expects the obligatoriness of both complement and subject, typical of verbs and clearly attested in gerunds. That such obligatoriness is not found in de-verbal nominals therefore serves as an argument that, fundamentally, they are inserted into the tree as nouns, and are not syntactically composed of a verb plus some nominal affix.

A second important observation concerning the structure in (2) is that syntactically, *destroy*, a verbal head, and *destruction*, a nominal noun, are equally complex—both are terminals. That one of them is morphologically complex and includes within it a stem that is largely identical to the verbal realization is most certainly not a

\textsuperscript{4} For a strict Bare Phrase Structure approach, note, this execution is impossible, as, in principle, the head is assumed to project its categorial properties, if any, and is not inserted under a pre-constructed categorial node. See Chapter 6, section 1 for more comments.

\textsuperscript{5} The suggestion that specifiers are subjects had to wait another fourteen years, to be introduced by Stowell (1981). Specifiers, in earlier versions of $X'$-theory, were typically functional items which nowadays would be assumed to head, or be the specifiers of, separate functional projections (e.g. determiners, degree modifiers, auxiliaries, etc.). Alternatively, specifiers were assumed to host adjectives, adverbs, and other modifiers. See, especially, Jackendoff (1977).
syntactic fact, and in fact, for Chomsky (1970), it is not clear that it reflects any systematic derivational relationship altogether. We note that in such a context even the term “derived nominal” in itself would be a misnomer, which is why the term “de-verbal nominal” has been opted for above. Finally note that, albeit not explicitly acknowledged, the entry for destroy must contain some phonological information. Were that not the case, the phonological overlap between /π destruction/ and /π destroy/ and similar pairs would become an inexplicable—and repeated—coincidence.

The case for the idiosyncrasy of complex words, and hence their listed nature, was considerably enhanced by Halle, who pointed out in Prolegomena for Word Formation (1973) the phonologically unpredictable nature of morphological operations, primarily within the domain of inflection. Observing, among other phenomena, lexically specified stem alternations under affixation, incomplete paradigms, impoverishment, the occasionally idiosyncratic interpretation of some inflectional morphemes (e.g. Russian instrumental case), and the unpredictable fusion of distinct inflectional markers, Halle argued that the erratic nature of the phonological output of word formation, insofar as it clearly necessitates the consultation of listed information, supports the case for the transfer of all complex words and their formation away from the more phonologically well-behaved parts of the grammar, i.e. syntax and, we may add, formal semantics. Halle did, however, propose a semi-formal word formation component, albeit structured so as to allow its output to consult idiosyncratically listed information.

Ironically, in the direct aftermath of Chomsky’s Remarks and Halle’s Prolegomena, and with the notable exception of Jackendoff (1975), a burgeoning community of word formation scholars eschewed, collectively, the notion that word formation is summarily non-generative, applying considerable talent to the attempt to systematize and formalize accounts of word structure and word formation. The systems that emerge are largely not only generative, but also suspiciously syntax-like. Beginning especially with the influential distinction of Aronoff (1976) between analytic and productive morphology, we see the introduction of rewrite rules and phrase structure (cf. Selkirk 1982); of heads for words (cf. Williams 1981a); and of subcategorization and constituent structure for affixes (cf. Lieber 1980). In fact, the formal devices used in constructing complex words became gradually so syntax-like, that a special condition has been introduced for the sole purpose of preventing the syntax from interacting with word-internal structure. Alongside the attempt to

6 Importantly, most of this research sets aside one of the problems that troubled Halle (1973) the most, namely possible but non-existing words. Most of these accounts chose, instead, to focus on the distinction between possible vs. impossible words. This move has enabled substantial progress in the study of word formation. It left, unaddressed, however, the fundamental cognitive difference between words and phrases, best expressed in the fact that the very notion “possible but non-existent phrase” is an incoherent one. While it is clear that the formation of word constituents continues to be available as a generative device throughout an individual life span, it nevertheless remains the fact that this generative ability is invoked irregularly, and is subject to social conditions and pressures of the sort not attested for phrases. Having noted this puzzle, I will, just like my predecessor and contemporary word-formationalists, proceed to set it aside.

7 Hence the Lexical Integrity Hypothesis of Lapointe (1980), reformulated as the Atomicity Thesis of Di Sciullo and Williams (1987), which explicitly barred the syntax from consulting the internal structure of
build a hierarchical structure for words, we also see a systematic attempt to introduce some order into the chaos by separating those affixes in which a high degree of regularity—morphological, syntactic, and phonological—is observed, from those affixes where such regularity is less frequent (cf. Siegel 1974; Allen 1978; Pesetsky 1979; and most influentially, Kiparsky 1982a, within the general framework of the Level Ordering Hypothesis and more specifically that of Lexical Phonology and Morphology).

Suppose we attempt an admittedly coarse summary of the consensus among lexicalist scholars working on word formation in the mid 1980s, focusing specifically on approaches to derivational morphology and on the syntactic implications of such approaches. By that time, and integrating many of the generative or semi-generative devices briefly outlined in the previous paragraph, the formation of complex words takes place in a component distinct from the syntax—call it WF, for Word Formation. “Word” in such models is a technical term reserved for formal objects which are the output of WF (including trivial outputs). The primitives of WF are affixes and bases. In that system affixes such as -ation, -al, or re- are functors (to appropriate the term used by Di Sciullo and Williams 1987), insofar as their attachment to some base results in the emergence of some well-defined formal properties. Bases, on the other hand, are by and large inert from a WF perspective. They are assumed to be pairs of sound and some lexical semantics, and they do have a category, but they do not define any grammatical operations, as such. WF manipulates affixes and bases (or possibly, affixes trigger WF manipulations of various sorts), giving rise to “words” (themselves potentially recycled into the WF component as a base for further affixation), and where “words”, now, is assumed to consist of a sound–lexico-semantics pairing (from which potentially its argument array is derived), and always with a syntactic category. Crucially, then, such models, although they do assume that, e.g. destruction is derived, at some point, from destroy, continue to assume that the morphological complexity of destruction is syntactically obscured, and that syntactically, the representation should fundamentally be as in (2).9

Consider in greater detail the justification for an independent formal component of Word Formation, given the development of more generative approaches to its words. To appreciate the significance of the need for such a condition, we may ponder the absence of any articulated principles barring the syntax from, e.g., consulting syllable weight.

8 Alternatively, “stems” or “roots”. Given the centrality of the term “root” in this work, and with a definition that is rather distinct from that mostly used in WF accounts, the term “base” is opted for throughout when referring to traditional accounts of WF.

9 This picture is, of course, greatly simplified. Morpheme-based accounts of word formation may differ greatly as concerning the degree of abstractness of affixes, the extent to which they spell out the output of rules, or are themselves the names of rules, and, of course, concerning the type of rules which manipulate morphemes and their possible target, ranging over category, subcategorization, argument array, and so on. From the perspective of these introductory comments, what is important is the assumption, I believe inherent in all lexicalist approaches, that the output of the word formation component is associated with sound and with syntactic properties which determine its merger possibilities, as well as the assumption that the output of WF operations is atomic in the relevant sense which is defined in the text. I turn shortly to a discussion of “realizational” models, which inherently entail a very different formal interaction between the syntax, the phonology, and the formation of complex words.
nature. As a first step, note that while “words” may be defined as the domain of a single primary stress, that only goes so far in accounting even for its phonological properties. A complex “words” cannot just be a single prosodic domain. Rather, there has to exist a phonologically relevant combinatorial system which is devoted specifically to putting words together, and which is distinct from prosody. The reason for this is the existence of phonological domains of rule application which are sensitive to morphological complexity, e.g. the cycle (or domains defined by boundary types), and which therefore require setting up some morphological domains as being, hierarchically, internal to others.

A cycle, of some sort, is fundamental to the construction of syntactically complex structures in all hierarchical, constituent-based approaches to syntax I am aware of. What, then, is the justification for the claim that word formation is nevertheless not syntactic, despite the appearance of similar combinatorial principles which are similarly constrained? The justification, as it turns out, harks back to Halle (1973 and to Chomsky (1970) and focuses on phonological and Content unpredictability. First, the specific phonological representation of particular morphological functions is often item-specific. Some affixes cause stress shift while others do not, and the choice of one over the other, in the context of a particular stem, seems item specific. Thus *inventivity (vs. inventiveness), but receptivity. The realization of past tense in the context of the verb walk is different from the realization of past tense in the context of verbs such as run or sing, a matter about which the respective entries of walk, run, and sing need to be consulted in some fashion. The nominalizer for destroy is -ation, and the pronunciation of destroy in the context of -ation is /π destruct/ but although construction appears quite related to destruction, we do not find /π constroy/. For defer, on the other hand, the nominalizer is either -al or -ment, but never -ation. The stem for receive is pronounced ceive, but the cept variety crops up in some affixation contexts. If word formation must crucially refer to idiosyncratic phonological information in lexical entries of stems and affixes, and if one assumes that the syntax is barred from so doing (and if one assumes that the syntax is phonologically regular, in the relevant sense), then word formation must be non-syntactic. Second, morphological cycles, however defined, nonetheless frequently correspond to non-compositional Content. This situation, it is claimed, is (by and large) not found with phrases, where the meaning is compositional, thus suggesting that the output of

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10 Thus functional vocabulary is frequently devoid of primary stress altogether, raising the question of what, if anything, makes the a “words”, if words are to be defined as the domains of primary stress. The problem, however, is only meaningful if the domain of stress is to be correlated with other, non-stress-related and non-phonological properties. If the domain of stress, on the other hand, is not expected to correlate with anything except stress and whatever phonological effects it has, the fact that the, otherwise spelled out functor, doesn’t have primary stress is of little relevance.

11 The terms “compositional” and “non-compositional” meaning, whether of formal objects or of conceptual Content, are used here in a non-technical (semantic) sense. I will assume a complex expression to have a “compositional” meaning if some transparent, systematic combinatorial rules can derive its interpretation on the basis of the meaning of its parts. For example, the interpretation of non-intersecting adjectives, in this context, is transparent and consistent (red face being a predictable combination of face with red-for-face; red sofa being a combination of sofa plus red-for-a-sofa) and hence, non-technically, compositional, in a sense that e.g. transmission, as a car gear, greenhouse, and even blackberry are not.
word formation is checked against Content in a way which does not apply to phrases, and hence that the formation of words differs fundamentally from the formation of phrases.

Note now that for such lexicalist approaches, “words”, as the outputs of an independent WF component, are not only syntactically atomic, as we already noted, but also, importantly, complete in providing a juncture of semantic, syntactic, and phonological information. As such, “words” within such approaches are unique formal objects, in that no other terminal or single representation in the grammar is complete in a similar sense. N or D as syntactic terminals are certainly not complete in the same sense, nor is their combinatorial output, DP, complete in the relevant sense. It has syntax, but arguably it doesn’t even have an interpretation, but rather must be converted to a semantically appropriate representation to receive one. It certainly doesn’t have inherent phonology or Content. Nor are the terminals or the output of phonological operations or semantic ones complete, in the relevant sense. As such, WF has properties that are very distinct from those of its fellow grammatical modules. To wit, the syntax creates representations which are translated into (possibly unique) semantic formulas, which themselves utilize semantic primitives and modes of composition which are distinct from those utilized by syntax. Certainly, one does not assume that semantic objects correlate to unique phonological objects, and even the claim that they correlate to unique syntactic objects is largely not accepted. Not so “words”, in the decades following Chomsky (1970) and Halle (1973), and most strikingly so, perhaps, in Lexical Phonology and Morphology. “Words”, here, are perceived as units which are morphologically constructed but are nonetheless simultaneously phonological, semantic, and syntactic objects, and where none of these distinct sets of properties is derived from another. Fundamentally, the lexicalist claim here is that a particular combinatorial module, WF, creates hierarchically complex structures which are privileged in creating a domain that must have syntactic properties that function as instructions for syntactic tree construction; they must have (lexical) semantics (some potentially deriving the syntactic properties); and they must come with instructions for phonological rule application. This is so even though, in and of itself, the atoms and the combinatorial processes used by the morphological combinatorial module are neither inherently semantic nor are they assumed necessarily to have fixed phonological or syntactic properties. In contrast, note again that no such relationship holds between syntax and phonology, or syntax and semantics, and such dependency is almost incoherent as a statement of the relationship between phonology and formal semantics. Phonological properties need not treat phrases as privileged atomic units (to wit, liaisons such as who’s and isn’t which arguably cross phrase boundaries), nor are phrases atomic semantic or Content units. Rather, they are subject to compositional semantic interpretation as based on their parts.12

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12 Not so for example in Construction Grammar, where a phrase, or a sentence, is a template consisting of discontinuous constituents, at times phonologically fixed (e.g. the his way construction) and which may presumably constitute a single unit of Content. For some comments on phrasal idioms, see the appendix to Chapter 9.
Within an agenda that was extremely influential, the triple role of the “words” became, effectively, the set of instructions that just about all other components of the grammar were to check. D-structure was but the tree constructed from the syntactic properties of the “word”, which then had to be preserved throughout the syntactic derivation. The phonology, likewise, was a direct mapping of the sound properties associated with the “word” into phonological–phonetic representation. While some aspects of meaning and syntax continued to be independent of the properties of “words” (presumably, all so-called A-bar operations), the view of the grammar as, effectively, checking the properties of “words” had come to play a progressively more important role. Very telling in this respect is van Riemsdijk and Williams (1981), who partition the syntax into two formally distinct components, the first, NP-structure, fundamentally lexicalist and receiving its “instructions” from “words”, the latter, more abstract, interfacing only with formal syntactic objects.

At least one major problem emerges immediately, however, when we observe the central role of the “word” in such approaches, and that is the fact that if we take “words” to be, at least phonologically, primarily prosodic units with a single main stress, then it turns out that identical grammatical information is represented as phrasal in some languages, but as a “word” in others (and see Marantz 1997 for discussion). Causatives may be a case at hand. While English and French opt for analytic causatives, polysynthetic languages opt for a synthetic form, as do Semitic languages. The expression \((Z) \text{ make } (X) \text{ cross } (Y)\), in English, is clearly phrasal, contains more than one main stress, and has two phonologically discrete verbal heads which may be separated from each other. Similar facts hold for \((Z) \text{ faire traverser } (Y) \text{ à } (X)\) in French, with two verbal main stress domains and a potential clitic intervener. On the other hand, Hebrew \((Z) \text{ he’evir } (X) (Y) \text{ ’cross-CAUSE’}\) is one prosodic unit, has no coherent separable parts, and allows no intervening material inside it. Even more problematic is the fact that the very same language may at times express the same grammatical information as a phrase or as a “word”. Consider again Hebrew, where a synthetic inchoative based on a particular adjective may occur alongside a periphrastic construction using that same adjective, and where the following are truth-conditionally equivalent:

\[
\begin{align*}
(3) \quad \text{a. } & \text{ ha.binyan hichib } \text{ ?im ha-zman} \\
& \text{ the.building yellowed in time} \\
& \text{ ‘The building became yellow/became yellower in time.’}
\end{align*}
\]

\[
\begin{align*}
\quad \text{b. } & \text{ ha.binyan na’asas/nihiya } \text{ (yoter) cahob } \text{ ?im ha-zman} \\
& \text{ became } \text{ (more) yellow} \\
& \text{ ‘The building became (more) yellow in time.’}
\end{align*}
\]

Any attempt to reduce the properties of syntactic configurations to properties of “words” would thus need effectively to have two very distinct structures giving rise to a suspiciously similar syntactic and interpretational configuration. To wit, in English and in French, \(Y\) is the subject of \text{cross}, but in Hebrew, it would have to be the object of \text{cross-CAUSE}. In one inchoative construction in Hebrew, ‘the building’ would be a subject of an adjective, in the other the (unaccusative) subject of a verb, and so on.
And yet, the interpretation of the argument configurations, the event structure properties, both syntactic and semantic, and the internal syntax are all arguably extremely close, if not identical. If constructed in distinct grammatical modules, such formal correlations between the outputs become a coincidence.\footnote{Rather than consider this duality a drawback, the system developed in Reinhart (2002) as well as in Reinhart and Siloni (2004) and Horvath and Siloni (2011) puts this duality forward as a cornerstone of language variation. The ”Syn–Lex Parameter”, specifically, allows a grammar to opt for either syntactic -\textit{arity} reducing operations or for lexical -\textit{arity} reducing operations. The latter, specifically, is local and consists of existentially binding one of the lexically specified arguments of a listed item. The result is an altered set of instructions to the syntax, in that the existentially bound argument fails to merge. -\textit{arity} reducing operations are by assumption illicit as such in the syntax. For instance, a lexical operation would allow a reflexive to form as a result of the binding of the internal argument, thereby giving rise to an intransitive (ungerative) structure. A correlating syntactic reflexive, however, would only be able to delimit the realization possibilities of an argument. Thus an internal argument must project, but may be realized as a clitic (e.g. se in Romance), thereby delimiting the realization possibilities of the direct object.}

1.3 Moving Away from the “Word”

1.3.1 A snapshot and road signs

Returning now to the question as broadly outlined at the end of section 1.1, the answer provided by lexicalist approaches to the interaction between (minimal units of) Content, PH, and syntax can be (broadly) diagramed as in (4):

\[ \text{Lex Parameter} \]

From a formal perspective, however, the Syn–Lex Parameter is rather illustrative of the inherent formal problems for the duality of representations. Intuitively, the meaning of -\textit{arity} reduction is fairly clear, but the intuition here is based on a discourse function— that is, on the generalization that an argument needs to be defocused or eliminated. Formally, no unified statement is available that could range over the existential binding of a lexically listed argument, on the one hand, and its realization as, e.g., a null pronominal or a clitic in the syntax. The parameter as stated, then, allows UG to force a choice between two formally entirely distinct operations, whose outputs happen to converge in terms of their discourse function. The difficulty is seriously amplified by the fact that no general formal parametric choice is— or could be— available and that -\textit{arity} reduction is relativized to a construction: -\textit{arity} reduction in reflexives, -\textit{arity} reduction in causative-inchoatives, and -\textit{arity} reduction in passive, and so on. But this presupposes that something like “reflexives” exists independently of its syntactic structure or its argument instantiation, a rather difficult concept to grasp outside the domain of discourse function, given the fact that it is not clear that any of these “constructions” are more than a linguistic terminological convenience.

Quite possibly, however, the most problematic aspect is the fact that the model is explicitly not committed to the (morpho-)phonological reality of the listed items to which -\textit{arity} reduction operations apply, and that in that sense, they appear to be more akin to Beard’s (1995) “Lexemes” than to “words”, as used, for example, in Williams (1981a, b). I return to this point, and to the role of phonology, in section 1.3.2 below, as part of a more general discussion of realizational models.

As a historical footnote, a syntax–lexicon parameter was suggested in Borer (1984), and pursued, for instance, in Borer (1990). Crucially, however, what was parameterized in that model was not a formal operation of any sort, which was in all cases identical and responsible for the concatenation of particular morphemes. Rather, the variation involved the merger possibilities of the output. A \textit{Lexical} choice entailed that the morpheme combination merged as such at D-structure. A \textit{Syntactic} choice entailed the merger of the morpheme combination as a super-tier, of sorts, of an already existing syntactic structure, providing it matched it phonologically. Morpheme combinations, in all cases, were syntactically opaque. A merger as a super-tier, however, left the syntactic ‘under-tier’ available, thereby giving rise to the appearance of word-internal transparency. No such transparency emerged for a D-structure merger, as no syntactic parallel structure existed to correspond to it.
Crucially, the notion of “word” as it emerges from (4) cannot be derived. In other words, there is no sense in which we could define words as a set of three properties, precisely because the “word”, by assumption, has properties which are meta-theoretical insofar as they do not emerge from the properties of its phonology, its syntax, or its Content, most important among them its atomicity. Nor do the constituent structure or the Content properties need to be minimal, and in fact, they are not constrained in any obvious way by the system. Rather, it is the existence of a listed item, a particular “word”, that serves as their *raison d’être*, so to speak. Thus compounds such as *blackboard* or *kitchen towel* are certainly not a single constituent, nor do they clearly have minimal Content, and arguably, the same holds for *arguably*, which corresponds neither to minimal Content (i.e. it is either ARGUE+able+ly or ARGUABLE +ly), nor is it a minimal constituent. Nor is there a necessary connection between the complexity of constituent structure, i.e. syntactic complexity and Content complexity—within quite a few lexicalist accounts it is assumed that transitive *break* is a superset of intransitive *break* in terms of its semantic properties (i.e. that intransitive *break* is derived from transitive *break* and entails an external causer), making transitive *break* syntactically minimal, but with complex Content. In fact, as is entirely clear from the model in (4), the only consistently well-defined and minimal domain that can be associated with e.g. the English “word” is phonological, and as a consequence the picture in (4) amounts to the claim that what is, in actuality, a minimal phonological domain (specifically for the assignment of stress), nonetheless has privileged properties that allow it to define an atomic domain that goes beyond the domain of phonology and extends into both syntax and Content assignment (and see Marantz 1997 on this latter point).

If we wish to reject the a priori privileged status of “words” in lexicalist models, and given the fact that the only robust definition of what a word is appears to be phonological, suppose we assume that words, or at least substantive words (as opposed to function words), are a prosodic unit of a particular (language-specific) size, or, wishing to be potentially broader, that phonological domains can be usefully defined so as to constrain the application of phonological rules, and that one such domain corresponds to what in English, as well as in a good many other languages, would correspond to the prosodic domain of a single main stress. Suppose we now call this particular domain “Phonological Rule Application Domain”, or P-RaD (with the understanding, of course, that it refers to a well-defined phonological domain among possibly other larger or smaller ones). Returning to (1) and to the potential correlations between Content, PH, and syntax, we can now fix the PH tip of our pentagon as some specific P-RaD, and ask what, if anything, P-RaD corresponds to within the area of well-defined syntactic or semantic properties.
When we now consider WF, and taking WF to refer specifically to combinatorial operations which give rise to complex structures of some sort, the inevitable conclusion that we reach is that for many accounts, WF is definitionally all combinatorial operations which are internal to the P-RaD, while syntax is definitionally all combinatorial operations external to the P-RaD (and see Aronoff 1994 for the same conclusion). This claim is implicit in any account that subscribes to the Lexical Integrity Hypothesis or to the Atomicity Thesis, and is explicitly espoused in Ackema (1995) and in Ackema and Neeleman (2004). What is, however, rather striking is that none of these accounts offers a definition for what a syntactic “word” or even a morphological “word” is, such that it is independent of P-RaD; i.e. independent of whatever domain is defined by the assignment of primary stress. To illustrate, in Lexical Phonology and Morphology, “word” is essentially defined in terms of a boundary type, #, itself no more than a diacritic marking a specific domain for phonological rule application. However, and following the original insights of Allen (1978) and Pesetsky (1979), Kiparsky (1982a) proposes that such a boundary defines, as well, a domain for both syntactic (i.e. constituent composition) and semantic operations. To wit, it is assumed that a + boundary can separate an affix from a non-word (presumably, a constituent devoid of Content), and hence, at least possibly, a category-neutral item; but not so #, which may only attach to what is already, itself, a word; the latter, it is claimed, necessarily with a category and with Content. Combinatorial Content across a # boundary is predictable, or so the claim goes, but not necessarily across a + boundary, and so on. Beyond its phonological role, however, what a # boundary is, from the perspective of categorial constituent structure or from a Content perspective, remains undefined.14

The conceptualization of the issues under consideration here might be facilitated by some diagrams. In (5a) there is an internal domain and an external domain, and P-RaD defines, or is defined by, the internal domain. The picture in (5b), on the other hand, associates P-RaD with some point in the syntactic structure. The picture on the left does not, of course, exclude the existence of a single combinatorial computational system (outside phonology). The system on the right, however, makes a stronger statement—it excludes, in principle, the existence of more than one combinatorial...

14 Essentially, LPM in particular and the Level Ordering Hypothesis in general view the issue in terms of domains, and claim that what we are calling here P-RaD is an atomic domain, and hence, presumably, must be complete in some well-defined sense. We note in this context that if true, then lexicalism, from this perspective, becomes axiomatic, rather than a matter to be empirically decided, as already suggested in the discussion of diagram (4). The claim, in turn, bears non-trivial similarities to Chomsky’s (2001) “Phase”, insofar as a “phase” defines a domain which is syntactically defined, but which nonetheless must be complete in some phonological and semantic sense. When comparing these two distinct domains and the theoretical assumptions that underlie them, in turn, three rather distinct issues must be addressed. First, whether it is altogether a theoretically and empirically sound move to create a unified domain for the satisfaction of phonological, syntactic, and meaning properties, where meaning spans both formal interpretation and Content. Second, assuming it is a good move, is such a domain to be defined phonologically, as in the Level Ordering Hypothesis, or syntactically, as in Minimalism? And finally, assuming the latter issue is settled, what, exactly, is the relevant domain, and from the perspective of the discussion here, most crucially, does P-RaD constitute one such domain? I take up this matter in Chapter 9.
computational system (again outside phonology). Crucially, in (5a) it is possible to define formal operations which apply to the inner box but not to the outer box, and that is, indeed, the primary task which faces proponents of an independent, non-syntactic WF. The diagram in (5b) excludes, in principle, the existence of such operations:15

(5) a. Syntax
   Morphology
   P-RaD

   b. Syntax
   P-RaD

Suppose, then, we adopt the stronger claim, according to which there could be only one unified computational component which is responsible for all constituent-building and all constituent-manipulating operations; call it “Syntax”. Within such an approach, P-RaD might correspond to some particular domain in the incremental merger system, or possibly more than one.16 If that is the case, then the formation of words, whatever they turn out to be, and providing of course it is combinatorial and hierarchical, cannot differ from the formation of phrases.17 However, in the absence of a distinct module of WF, and in the absence of “words” as conjunctions of phonological, semantic, and syntactic properties, we must otherwise address the concerns put forth by lexicalist accounts which have motivated the lexicalist shift to begin with. These concerns are phonological, i.e. those that involve the way in which entry-specific material impacts the phonological spellout of words; they are morphological, i.e. they concern the particular choice of affixation in particular contexts; they are Content related, i.e. they concern the emergence of non-compositional Content for complex words; and they are syntactic, i.e. they concern the emergence of syntactic properties, including category and insertion frame. To illustrate, within the area of phonology, such an account would need to address itself, at the very least, to defining a domain within which one can find stem alternations such as receive/cept or sing/sang and to how information about such alternations and their environment is to be encoded. Within the area of morphology, it would have to show itself capable of capturing the fact that e.g. transform is nominalized as

15 Note that the relationship between the inner box and the outer box need not be linear and was explicitly assumed not to be so in Parallel Morphology (cf. Borer 1991 i.a.). That the inner box must be distinct, formally, from the outer box was argued expressly in Borer (1998b), as based on distinct formal properties of morphological and syntactic operations. Many of these arguments are developed and augmented in Ackema and Neeleman (2004), although quite a few of them have been made obsolete by the shift away from X'-theory (see Chapter 6). My own change of perspective is ultimately based on the conclusion that the modules cannot be formally separated without compromising explanatory adequacy, and that insofar as formal distinctions may still be discerned, they are a set of instructions for a future research agenda, rather than its bottom line.

16 The choice of a spellout domain for a particular form could, in turn, interact with language specific phonological factors, and in particular, the phonological realizational properties of what I will call, below, S-functors. See section 1.5.4 as well as Chapter 9, section 2 for the relevant discussion.

17 A characterization, I believe, true of so-called derivational morphology, but not necessarily of so-called inflection, and see sections 1.3.2 and 1.4 below as well as Chapter 6, section 3 for some comments.
transformation, but defer as deferral. Content-wise, the task would be to account, e.g., for the possible emergence of a specialized Content for transformation, but never for gerunds; and finally, syntactically, at the very least it would have to account for the emergence of specific categorial behavior for (a) cat and (to) walk, on the one hand, as well as for (a) transformation and (to) verbalize on the other. Much of this book is devoted to constructing a model which, I believe, is capable of giving at least some answers to these questions. In the remainder of this introduction, I will briefly outline some general core ideas I will be following throughout. A detailed elaboration as well as justification for the model will be pursued in Chapters 6–10.

1.3.2 Phonological considerations and realizational models

We noted that the perception of the “word” as a unit that is at the same time phonological, syntactic, and semantic, is crucial to lexicalism. In turn, this perspective is rooted in the view of the morpheme as the smallest unit of sound–meaning correspondence, coupled with the essentially structuralist view entrenched in Chomsky (1965), according to which syntactic structure is incrementally constructed from categorically marked primitives. Certainly, insofar as the building blocks of “words” are themselves already units of sound and meaning and possibly syntax, one can hardly expect the output to be devoid of such properties. As it turns out, and in addition to the consequences already outlined, the fundamental grouping of these properties also gives rise to a very specific view of the interaction between the formation of words and the syntax. One such consequence is noted in Borer (1998b) and consists of the fact that lexicalist models are perforce linear—that is they assume the existence of a single point of interaction between “words” and the syntax, and specifically, that the output of the lexicon (assuming the lexicon to allow the internal modification of listed items) is the input to the syntax and specifically to D-structure, or to primary merge. In the strongest articulation of these claims, that of Kiparsky (1982a), this entails that word phonology and inflection as well must be part of the lexicon and hence must precede the syntax. In other accounts, lexical representations may be underspecified, phonologically, at merger, but only insofar as aspects of phrasal phonology may impact them at a subsequent point.

To appreciate the fact that this execution is just about inevitable within an approach that strictly views the morpheme as the smallest sound–meaning unit, it might be worthwhile to consider a large number of syntactic accounts of word formation prevalent in particular in the 1990s and subsequently, all inspired by Baker’s (1985) Mirror Principle. The accounts under consideration are specifically those which allow for the syntactic merger of inflectional morphemes, complete with phonological information, in an attempt to thus piece together, so to speak, the inflected phonological word.18 It is, I believe, fair to say (and see Anderson 1992 and

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18 Baker’s (1985) original argument was not based on inflection, but rather on the interaction of syntactic structure and argument-structure changing morphology (passive and causatives) which, unlike inflection, is typically extremely phonologically stable, and is certainly very stable in the polysynthetic languages studied in Baker (1985, 1988). From the perspective of the model to be articulated here, it is thus quite possible that the Mirror Principle, as a descriptive generalization, is valid, for morpheme ordering,
Halle and Marantz 1993, as well as Borer 1998b) that this particular research agenda has been unsuccessful, insofar as after two decades, it is rather clear that any such account is in principle incapable of handling the degree of phonological idiosyncrasy found, typologically, in inflectional systems, involving, among many other factors, unpredictable gaps; different orders of markers even within the same language; a single marker that correlates to two syntactic distinctions; two markers that correlate to a single syntactic distinction; markers that don’t have an obvious syntactic correlate; etc. The consensus, in the morphologically informed literature, is that the task of relating syntactic structure to phonological realization cannot be thus accomplished. This particular conclusion, if coupled with the view of inflection as a morpheme in the classical sense (=the smallest sound-meaning unit), thus results in the inevitability of a morpho-phonologically rich lexicon.

As it turns out, however, the classical morphemic view itself has come under a fair amount of criticism. In a series of extremely influential works, and following insights originally in Matthews (1972, 1974/1991), Beard (1981, 1995) presents a system of word formation in which phonological realization is explicitly severed from any morpheme structure, a hypothesis that has come to be known as the “Separationist Hypothesis”, and which has given rise to a class of models commonly referred to as “realizational”. Most crucially, within realizational models, phonological form need not correspond strictly to constituent structure or to any listed unit. Indeed, in much of his own work, Beard denies the use for any such constituent structure. It therefore follows that even if there is a lexicon with listed units, such units are not listed with fully specified phonological form, but rather their phonological realization may be potentially sensitive to a variety of independent factors including aspects of the syntactic derivation. Thus at least one obvious way to execute this insight would be to assume that phonological realization operates on syntactically (in)formed constituents, which would then entail that it is post-syntactic, i.e. involves so-called “Late Insertion”.

Thus viewed with the benefit of hindsight, we may now conclude (as would Halle himself, no doubt) that it was probably an error to conflate the phonological irregularities within the inflectional domain with the syntactic and Content irregularities within the domain of so-called derivational morphology, so as to use inflectional irregularities as supporting evidence for the listed nature of all outputs of word formation operations. While the realization of inflection certainly does appear to be contingent on listed information, and while an account of “word” unpredictability within the domain of syntax and Content is certainly required, it nonetheless appears rather clear that the formal characterization of the former may be quite different from the formal characterization of the latter, and that little is to be gained from conflating them. This is all the more so because, as I will show in Chapter 9, the domains for “inflectional irregularity” and “Content irregularity” do not converge.

insofar as derivational functors, I will suggest, are syntactic terminals and hence, trivially, “morphemic”. The translation of Baker’s original insight into the inflectional system emerged, originally, as a result of Belletti’s (1990) attempt to derive the inflection of the Italian verb from the split INFL system proposed in Pollock (1989).
This said, realizational approaches do not necessarily all agree on the precise objects to which phonological realization applies, or, for that matter, on the nature of what, if anything, is the listed residue and on the extent to which it may or may not be subject to lexical manipulations. Beard himself (1995, 1998) subscribes to the view that all processes which impact the listed item, the “Lexeme”, result in a possible phonological modification, a generalization which he holds to be true for both (traditional) inflection and derivation. Specifically, then, insofar as one can refer to some words (e.g. sings, singing, singer) as complex, their complexity is not cumulative or hierarchical, but, rather, marks such complex forms as having undergone some process which results in a distinct phonological realization. To illustrate, in the mapping from sing to sang as well as in the mapping from walk to walked, neither the phonological change in sang nor the one in walked corresponds to the existence of a chunk of structure that we can refer to as PAST and with which we can associate some well-defined phonology. Rather, a process that we may refer to as PAST is responsible for changing the phonological information associated with sing and walk respectively so as to give rise to a distinct phonological realization of the output.

Similarly, in deriving e.g. deferral from defer, we can assume a process called NOM which modifies the phonological information of defer so as to result in the phonological form corresponding to deferral. Crucially, there is no sense in which walked has more complex constituent structure than walk, or deferral is more complex than defer. The reader might note that in making this latter assumption, Beard’s system is rather akin to Chomsky’s (1970) original view of the relationship between pairs such as destroy and destruction (see (2) and related discussion). Finally, insofar as the processes under consideration apply to some object, that object, the Lexeme, is for Beard fundamentally a Content unit associated with a categorial label and some basic (underspecified) phonological information. The Lexeme, we note, cannot have meaningful internal complex constituent structure, making e.g. walk and patronize, or verbalize, effectively identical grammatical objects, and likewise boy and dancer, with the agentive content of the latter representing semantic derivational complexity, rather than one that might involve a complex constituent structure.

Endorsing a realizational approach in some domains, Anderson (1982, 1992) proposes a specific model which allows e.g. sing or walk to be marked as PAST in the relevant syntactic context, while at the same time continuing to maintain that they are not complex constituents, and that e.g. PAST is not a morpheme, where by “morpheme” here we mean an affix of some sort (and hence “Amorphous Morphology”). Anderson is clear, however, in maintaining that a distinct, hierarchical system (albeit a lexical one), complete with morphemic representation, may exist alongside such a realizational system, with the latter covering roughly (but not precisely) what is at least at times referred to as “Derivational Morphology”. In his system, then, such hierarchical structures may, in principle, be capable of combining listed items which are smaller than Lexemes in the sense of Beard (1995, 1998), and specifically, items that may fail to be triplets of Content–syntax–phonology.

An approach that is simultaneously morphemic and realizational, finally, is put forth within the framework of Distributed Morphology, beginning with Halle and Marantz (1993), and subsequent work primarily by Noyer (1997), Embick (2000,
2004, 2010), Embick and Halle (2005), Embick and Marantz (2008), Bobaljik (2000, 2005, 2008), Nevins and Nevins et al. (2008, 2010, 2011), and others. Within that approach, both inflection and derivation are morphemic insofar as they correspond, specifically, to a well-defined merging syntactic constituent, with meaning, but no sound. Thus insofar as, e.g., sang and walked are associated with PAST, and insofar as PAST is a (syntactically merging) morpheme, both sang and walk are (at least) bi-morphemic and hence syntactically complex. The realization model in Distributed Morphology, however, is considerably richer than that assumed in either Beard (1995, 1998) or Anderson (1982, 1992) in allowing radical manipulation of the syntactic constituent structure prior to the actual spellout, or the phonological realization. Possibly the most radical manipulation involves the “flattening” of the structure (to give rise to “M-Structure”), to be followed by a variety of modifications that operate on a linear string and which may involve fusion, fission, reordering, insertion, deletion, and so on, all prior to defining the specific units which are then subject to phonological realization (or “Vocabulary Insertion”, in the terminology of Distributed Morphology). Like Beard and presumably Anderson, Distributed Morphology avails itself of a list of (basic) Content units with some well-defined properties, with which other morphemes may merge. Unlike Beard (1995), however, listed units, explicitly, cannot be complex and do not have a syntactic category. They are, rather, “roots”. As should become evident, the model to be developed here shares, with Distributed Morphology, the assumption that the basic listed item, the root, is not complex and is devoid of a syntactic category. Nonetheless, the notion of root to be developed here will be distinct in other rather important respects from that utilized in DM. I return to this matter, briefly, in section 1.4 below, and at greater length in Chapter 8.

1.3.3 In defense of derivaional constituents, preliminary

When considering much of the realizational literature, of which the three approaches above are fairly representative but are by no means an exhaustive sample, one is rather struck by the overwhelming focus on inflection coupled, nonetheless, with conclusions which are asserted to apply to derivation as well. That is certainly the case in Halle and Marantz (1993), as well as in Noyer (1997), Bobaljik (2000, 2009), and Nevins (2010). It is even more striking in Beard (1995, 1998). In Beard (1995), an extremely sketchy discussion of (category changing) derivation (Marchand’s “Transposition”) is summarized as follows: “The importance of discussing transposition at this point is that it allows us in future chapters to exclude from consideration all operations which simply change lexical class”. Beard (1998) then asserts on the basis of an equally sketchy discussion that there is no need for any hierarchical representation for any of the processes typically referred to as “derivation” (excluding compounds). And yet, in the present author’s native language, as in all Semitic languages, just about any phonologically well-formed unit is the output of what would otherwise

19 And where by “inflection” here I refer, rather loosely, to markers which are typically assumed to be conditioned by syntactic dependencies such as tense, agreement, case, aspect, plural marking, and so on, and by “derivation” primarily to the affixation of category-marked affixes (and setting aside non-category changing prefixes).
be labeled a “transpositional” or “functional” morphology, and the matter is hardly as “simple” as Beard suggests, nor is it “purely” phonological in any theoretically helpful sense.  

Suppose we consider now “inflection” vs. “derivation” from the point of view of the correlation between what we may broadly think of as Form and what we may broadly think of as Function, and taking as our starting point -ed and -tion as Forms, and PAST as well as a categorial label such as N[V] as Function (and where N is a projecting category and [V] defines its categorial complement). The fact of the matter is that in neither case can the Form be predicted from the Function. N[V], in English, at the very least may be spelled out as -ment, -al, -ance, -ence, -age, and possibly -ure as well.  

PAST in English is associated with a broad range of unpredictable stem allomorphs, sometimes in conjunction with no dedicated past tense marker at all and at other times possibly maybe with -t, and hence sang, ate, broke, caught, dreamt, etc. Consider, however, the predictability of Function from Form. Although -tion at times attaches to stems which do not have a clear category (e.g. nation, potion), it never attaches to anything that is categorially distinct from V, and while there are sporadic cases of verbs that end in -(a)tion, these are all clearly reanalyzed erstwhile nouns. Moreover, there are, to be sure, some stem allomorphs in conjunction with -(a)tion (destroy–destruction; perceive–perception), and -(a)tion itself has three (rather minimally different) variants, but these are really quite limited, when we compare them to the domain of inflection. A similar situation holds for other so-called derivational suffixes. While the spellout of V[N], a Function, may not be predictable, and may be instantiated as -ize, -ate, and -ify (and possibly as en- and be- as well), the Functions of -ize or -ify are entirely predictable from their Form. When we turn to the area of so-called inflection, however, what we find is not only that Form is not predictable.

20 Beard (1995) discusses three types of operations as (putatively) coming under “derivation”: category-changing morphology (transposition, e.g. form→formation), functional morphology (recruit→recruiter; recruit→recruiter), and expressive morphology (evidential marking, diminutives, augmentatives, etc.). Because he is committed to the non-hierarchical representation of these processes, and because he believes compounds have a hierarchical structure, compounding is summarily expunged from the realm of WF.

Most of the arguments put forward by Beard (1995, 1998) are intended to challenge the assumption, inherent in hierarchical approaches to WF, that morphemes are listed. His challenge to listliness, on the other hand, is based on the comparison of properties of morphemes to properties of what he presupposes without much discussion to be the paradigmatic listed items, namely Lexemes. Insofar as “Lexemes”, for Beard, are a triplet of syntactic information, semantic information (=Content) and phonological information, the expectation is that if (derivational) morphemes are listed items, they should have a similar set of properties, which, Beard argues, they do not. In the model under development here, derivational morphemes are the spellout of a syntactic function (at times in conjunction with a semantic one), and Lexemes, as such, are an ill-defined notion and certainly do not correspond to listliness. As a consequence, most of the criticism advanced in Beard is not applicable. For a fuller discussion see Chapter 7, section 5. We note, finally, that the distinction between “transposition” and “functional” morphology is not clearly well motivated. Concerning so-called “expressive” morphology, it appears rather likely that it is, indeed, to be treated on a par with inflection, which is to say, as marking that is integrated into Extended Projections and is primarily realizational (and see section 1.5 below as well as Chapter 6, section 3).

21 As well as, of course, -ing, -er, and possibly -ec, all three with well-defined distinct semantic functions. I return to this matter at some length in section 1.5.1 below as well as in Chapter 6. See also Chapters 4 and 12.

22 E.g. condition, question, ration, etc. I return to these cases in some detail in Chapter 7, section 4.4.
from Function, but that Function is altogether not predictable from Form. Thus there
are no cases in which -\textit{ation} fails to return a N, even if at times N is homophonous
with a (reanalyzed) V. English -\textit{s}, however, may mark plural, verbal inflection, and
case. Once we turn to -\textit{ed}, we find that there are at least two major cases in English in
which -\textit{ed} fails to return PAST, one involving participial cases and the other adjectives.
Nor is it the fact that across its occurrences -\textit{ed} always attaches to (attested) V—
to wit, \textit{winged}, \textit{legged}, etc. Much more crucially, and regardless of the specific analysis
of past tense marking in such cases, the Function of the marking in pairs such as
\textit{give–gave}, \textit{break–broke}, \textit{catch–caught}, or, for that matter, \textit{goose–geese} is, to put it
mildly, not obvious. The lack of the ability to predict Function from Form in
inflection is so severe that few grammarians think of -\textit{ed} or of -\textit{s} as meaningful
items in themselves. Rather, the common assumption is that inflection, even if it
corresponds to a constituent, or a morpheme, is abstract—e.g. PAST or PL. Once cast
in terms of an abstract Function, “inflection” becomes, of course, entirely regular. It
is, in fact, \textbf{only} in terms of the abstract Function that one could claim that “inflection”
is more regular than “derivation”. V+PAST is a combination with entirely predict-
able properties, not only syntactically, but also semantically. V+\textit{ation} may be (just
about) predictable in terms of its category, but its Content very frequently falls short
of such predictability. It thus emerges, very roughly put, that “inflection” should be
characterized in terms of its syntax and its semantics, while “derivation” should be
characterized in terms of its syntax and its phonology. Insofar as realizational models
have been extremely successful in bypassing intractable problems of “inflection”, this
is precisely because “inflection” is very often the ad hoc phonological realization of
what is, otherwise, a semantically and syntactically fully predictable generalization. In
fact, so predictable that inflectional marking is almost superfluous, and thus can
afford, so to speak, to be largely missing in many languages, and very erratically
marked in others. If, however, “derivation” is a broad description for a class of
generalizations which are always syntactic and frequently \textbf{only} syntactic, and which
need not have a semantic value, nor, necessarily, give rise to predictable Content, it is
at least plausible to assume that whatever function they do have, and insofar as such a
function may not be otherwise discernible from either semantics or Content, it may
need to link to a more regular set of phonological realizations. But if at all on the right
track, this suggests that radical realizational models cannot work for derivation; that
derivation is, quite possibly, morphemic in \textbf{some} sense, and that attempts to conflate
“derivation” and “inflection”, either along the lines suggested by Beard (1995) or by
Distributed Morphology, are on the wrong track.

Wishing to translate the informal intuition in the previous paragraph into an
actual rigorous model, I will assume that inflection is, indeed, radically realizational,
which is to say, I will assume that it is amorphous, and that e.g. \textit{sang}, \textit{walked}, and
\textit{dreamt} are all non-complex. As a consequence, I will also assume, as in Anderson
(1982, 1992), but not as in Halle and Marantz (1993), that although there certainly is
something that we may refer to as PAST, what \textit{sang} or \textit{walked} correspond to is not a
combination of a stem (or a root) + PAST, but rather the spellout of a stem (or a root)
marked as PST. There is, differently put, no morpheme boundary inside \textit{sang}, nor is
there one inside \textit{walked} or \textit{geese}, for that matter. Not so -\textit{ation}, or more accurately,
the categorial functor that comes to be spelled as /π-ation/. I will argue at some length that the relevant functor merges and projects syntactically, and that as a result, any combination of -ation with any stem is at the very least a binary branching structure.

The complexity of structures realized with -ation vs. the absence of such complexity in e.g. sang, or for that matter [n jump], is discussed at some length in Chapters 6–11. Most crucially, a notion of locality will be developed and argued for in this book which would specifically distinguish between the local domain defined by e.g. formation and that defined by sang. For the time being, then, it is hoped the reader will bear these differences in mind, while awaiting a discussion of their justification and ramifications to be undertaken in Part II of this work.

1.4 Roots, Preliminary

If, indeed, categorizing affixes are constituents, it follows that in contrast with e.g. Beard (1995), it cannot be assumed that /n dancer/ is the spellout of a single constituent. Rather, we must assume it to correspond to a complex structure consisting of two merged terminals which spell out as /ν dance/ and /νer/ respectively. Assuming for the sake of the discussion that we actually know what function /νer/ spells out, this still leaves us with the question of what /ν dance/ is. By extension, and assuming that functors which spell out as /νer/ or /ν-ation/ attach to something, what is that something, and what list or reservoir does it come from? In accordance with the assumptions made so far, it could only be defined as some subpart of P-RaD, to which combinatorial principles may apply. Suppose we call such basic, underived units “roots” and proceed to notate them, at least initially, as √XYZ. Importantly, roots are not “words”. A “word”, i.e. a P-RaD, can clearly consist of multiple roots—to wit, /ν saber tooth tiger/—in which case it is clearly derived, and thus by definition cannot be the basic underived unit we are in search of. A root, furthermore, need not be a P-RaD, need not even be a possible P-Rad, and quite possibly can never be a P-RaD. But what, then, are basic underived units? More importantly, how do we know one when we see it?

To illustrate some of the difficulties, suppose we take /ν cat/, following the seminal discussion in Marantz (1996). Is /ν cat/ a spellout of √CAT? Not so, claims Marantz (1996), and Borer (2005a, b) (as well as here) agrees—/ν cat/ is not the spellout of √CAT but rather of a larger syntactic unit, which, at the very least, also includes the information that it is a noun. The claim embeds two important related assumptions, both of them radically non-lexicalist: first, the claim that the basic underived unit, the root, is in and of itself devoid of syntactic category, and second, that syntactic category becomes available through syntactic structure. It is precisely this separation of category from root that allows us to propose that /ν cat/ is the spellout of some

23 The term “root” replaces here the term “listeme” used in Borer (2005a, b). Although many of its erstwhile properties remain largely unchanged, the general perception of what roots are as well as specific claims concerning their Content have changed. See directly below and Chapter 8 for extensive discussion.
structure which is distinct from $\sqrt{\text{CAT}}$. But these assumptions are by no means self-evident, nor is the three-way distinction between $\sqrt{\text{CAT}}$, $\pi\text{cat}$, and $\ldots\text{cat}\ldots$.

There is also a theoretical claim put forth here which is likewise less than self-evident: that a root in itself need not, and possibly cannot, serve as an independent domain for phonological spellout.

The assumptions, as well as the claim, do receive preliminary support from Semitic languages. In Semitic languages, as is well known, all verbs and most native nouns and adjectives contain what is, indeed, traditionally referred to as “root”, and which consists of a group of ordered consonants, or radicals, ranging from two to four. If, indeed, such a group of radicals is the basic underived unit in the sense of our (technical) root, then it is patently clear that it can never amount to a well-formed P-RaD in the relevant sense and that it does not have a category. In turn, all additional phonological information which would render these consonants pronounceable—vowels, affixes, gemination, and so on—comes at a syntactic price. Specifically, their addition is only compatible with the resulting form belonging to a particular syntactic category, and within the verbal domain, typically also as being inflected for a particular tense and voice. Thus it follows that in Semitic languages, it is never the root that is pronounced by itself, but rather, at the very least, the root in conjunction with whatever syntactic structure is responsible for its categorization.

But if roots do not have a category and can never be pronounced by themselves, what are they? Specifically, what are the Semitic roots $\sqrt{\text{KTB}}$, or $\sqrt{\text{XŠB}}$, or $\sqrt{\text{PQD}}$? Could they, for instance, correspond to Content? By way of a preliminary answer, suppose we consider the cases in (6), with each cell containing forms derived from the same root:25

<table>
<thead>
<tr>
<th>$\sqrt{\text{KTB}}$</th>
<th>$\sqrt{\text{XŠB}}$</th>
<th>$\sqrt{\text{PQD}}$</th>
</tr>
</thead>
<tbody>
<tr>
<td>$\text{katab}$ ‘write’</td>
<td>$\text{xašab}$ ‘think’</td>
<td>$\text{paqad}$ ‘order’</td>
</tr>
<tr>
<td>$\text{niktab}$ ‘be.written’</td>
<td>$\text{nexšab}$ ‘be.considered’</td>
<td>$\text{nipqad}$ ‘be.absent’</td>
</tr>
<tr>
<td>$\text{hiktib}$ ‘dictate’</td>
<td>$\text{xiššeb}$ ‘calculate’</td>
<td>$\text{piqqed}$ ‘command’</td>
</tr>
<tr>
<td>$\text{hitkateb}$ ‘correspond’</td>
<td>$\text{hexšib}$ ‘esteem’</td>
<td>$\text{hipqad}$ ‘deposit, entrust’</td>
</tr>
<tr>
<td>$\text{katab}$ ‘correspondent’</td>
<td>$\text{xašab}$ ‘accountant’</td>
<td>$\text{paqad}$ ‘sergeant’</td>
</tr>
<tr>
<td>$\text{miktab}$ ‘letter’</td>
<td>$\text{maxšeb}$ ‘computer’</td>
<td>$\text{mipqad}$ ‘census’</td>
</tr>
<tr>
<td>$\text{makteba}$ ‘desk’</td>
<td>$\text{maxšaba}$ ‘thought’</td>
<td>$\text{mipqada}$ ‘army HQ’</td>
</tr>
</tbody>
</table>

The Content commonality appears sufficiently robust to find it tempting to say that e.g. $\sqrt{\text{KTB}}$ has some conceptual Content to the effect that it is related to writing, although we note that deriving predictably the Contents DESK or DICTATE from WRITE may not be a trivial matter. Any proposed putative Content for $\sqrt{\text{XŠB}}$, now, would need to be considerably vaguer, related possibly, but rather loosely, to high cognitive processes. Clearly, however, the predictive powers here are extremely

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24 Although XSM categorization follows a very different route from Distributed Morphology categorization. See Chapter 7 for a detailed discussion.

25 See A Note on Hebrew Transcription, p. xxiv, for conventions used in transcribing Hebrew.
limited, insofar as the Content \textit{CALCULATE} cannot be predictably related to that of \textit{ESTEEM} or \textit{BE.CONSIDERED}, nor is it obvious how either one emerges from the interaction of the root with the morphological pattern it is embedded within. Matters go considerably further downhill when we consider the case of \textit{√PQD}. While historically one could possibly link the emergence of these different Contents to some common source related to (numbered) troops, it is also clear that this history is but an anecdote to the current learner or speaker, and that for all intents and purposes, \textit{√PQD} is either (at least) a three-way homophony, or, alternatively, has no Content independently of its categorized occurrences.

To the best of my knowledge, the only study that has attempted within a rigorous derivational system to associate Content with roots is that of Arad (2005), who sets up a number of entailments as a condition for assessing the commonality of root Contents in distinct morphological environments. In the final analysis, however, her study yielded an extremely small number of root–Content clusters that consisted of more than a single output form, and even within these, predictability was extremely limited. To wit, even if we assume that there exists a root \textit{√PQD} (one of three homophones) with the Content "count (specifically people)", and another with some "command"-related Content, it still remains a mystery why the \textit{mipqad} ‘census’ form should be related to the “count” root, but the morphologically identical, but feminine marked, form \textit{mipqada} should be related to the “command” root. Nor does the specific meaning of \textit{paqad}, ‘sergeant’ rather than say ‘colonel’ follow in any way. I return to this matter in Chapter 11, but it seems rather clear that if we are to find an answer to the question of what a root is, and if Semitic roots are our paradigmatic root, a reliance on Content as a foundation for what a root is, is at best weak and at worst circular.26

Lest the reader conclude that Semitic roots are simply another kind of root, consider the case of English /a\_round/. Presumably, somewhere within all pronunciations of /a\_round/ there is buried the root \textit{√ROUND}. But what is that root? Is it, for instance, a Lexeme, in the sense of Beard (1995) and much subsequent work, where by Lexeme we mean here very specifically a unit of Content which may have variable phonological or syntactic realization? Well, we may think we have a relatively clear notion of what the Content of \textit{round} is, but upon closer inspection, it is evident that \textit{√ROUND} shares a surprising number of properties with \textit{√KTB} or \textit{√XSB}. If we generalize over all occurrences of /a\_round/, we are likely to find a (somewhat vague) conceptual Content that they have in common. This said, as a rigorous foundation for the Content that we actually get for the different instances of /a\_round/ in e.g. (7a–f), it appears rather limited:

(7)  a. a round of applause  
b. a round of poker  
c. a round building  
d. to round the barn  
e. to round the numbers  
f. to round up (the children)

26 This is not to deny the existence of semantically rigorous correlations within Hebrew morphology, a matter I return to in Chapter 11, section 5.
We could, of course, give up and claim that (uncategorized) roots are but a phantom of a deluded collective linguistic mind. Rather, the logic would go, what (7a–f) show clearly and conclusively is that the basic units we are playing with here are, at the very least, categorized constituents, and that \[^{16}\text{[N round]}, \text{[V1 round]}, \text{[V2 round]}, \text{and [V round (up)]}\] are different listed entries, complete with category and Content. The regrettable side effect of such an approach, however, is that it would render the phonological similarity, indeed, identity, a mere coincidence. Pairs such as \text{table–table}, \text{chair–chair}, \text{floor–floor}, \text{paper–paper}, \text{blackboard–blackboard}, \text{chalk–chalk}, \text{walk–walk}, \text{kiss–kiss}, and so on would likewise become coincidences, as well, of course, as \text{round-about}, \text{roundtrip}, \text{round robin}, and the nominal expression \text{a round up}, altogether a somewhat unfortunate result. A rather forceful illustration of the very same point emerges from the following paradigm, originally discussed in Clark and Clark (1979):

\begin{enumerate}[a.]
\item The factory horns siren\text{ed throughout the raid.}
\item The factory horns siren\text{ed midday and everyone broke for lunch.}
\item The police car siren\text{ed the Porsche to a stop.}
\item The police car siren\text{ed up to the accident site.}
\item The police car siren\text{ed the daylight out of me.}
\end{enumerate}

As noted in Borer (2005b), each of the occurrences of \text{siren} here, as a verb, has rather different Content. That, of course, in addition to whatever Content comes with \text{siren} when it occurs as a noun. A Content-based listing would thus force us to list \text{siren} five times, thereby overlooking the fact that in none of these cases does the Content actually come from \text{siren} itself—rather it comes from its syntactic context; as well as the fact that the picture, on the whole, is characterized by innovative word use and is hence the least likely to represent a list.

We could also assume that of all the cases of /\pi round/ in (7a–f) and elsewhere, (or for that matter of all cases of /\pi siren/), one is basic (e.g. \[^{26}\text{[N round], [V round]}, \text{and [V round (up)]}\] and the others are derived from it by conversion or zero affixation of some kind. The latter approach, however, will hardly resolve our Content conundrum. Insofar as the Content of \[^{26}\text{[N round], [V1 round], [V2 round], and [V round (up)]}\] as well as the assorted compounds is different and unpredictable from the Content of \[^{26}\text{[V round]}\], even if they are derived from \[^{26}\text{[V round]}\], they would need to be separately listed, rendering the conversion here a vacuous operation.27

 Needless to say, the problem is endemic and is not restricted to (apparent) monomorphs. Thus consider /\pi form/, occurring as a phonological string not only as a noun and a verb (and with very clear Content similarity), but also in \text{formative}, in both its transparent and technical use. Relating the verbal and noun instantiations of \text{form}, as well as the transparent adjectival derivative (as in \text{a formative experience}) to one common Content seems plausible enough. But are we then to say that \text{formative}, as in \text{grammatical formative} is separately listed, and the fact that it can be segmented

\begin{footnote}
27 I return to the matter of zero categorial affixation in Chapter 7. The choice of \text{round} here and elsewhere is in recognition of the work on zero affixation (or lack thereof) by Pennanen (1971, 1983).
\end{footnote}
into portions which elsewhere make up for a productive combinatorial operation is a coincidence?

The bottom line, and as is entirely evident from both the Semitic and the English examples, is that the commonality displayed among the forms in (8) or in (7a–f) is neither that of Content nor that of structure. To be sure, that commonality may display Content correlations of varying degrees of vagueness. What is clear, however, is that such Content correlations have little, if any, formal status, and that the drive to give any uniform source, of any kind, to all instantiations of round is fundamentally, and crucially, phonological. If, indeed, there is a root \( \sqrt{ \text{ROUND} } \) which is embedded in all occurrences of /\(\pi\)round/ and a root \( \sqrt{ \text{KTB} } \), or even \( \sqrt{ \text{PQD} } \) which underlies all the relevant occurrences in (6), at the very minimum it must contain phonological information. It is of course possible that it contains more, but I submit that had the phonological identity not been there, the question wouldn’t have even arisen. This is, in fact, exactly the conclusion reached by Aronoff (1976), and which has led him to challenge, altogether, the notion that “morphemes”, the basic building blocks of morphology, are, as traditionally defined, the smallest sound–meaning pairs. I return to some of his specific arguments in Chapters 6 and 8. Here, I will assume that this is precisely correct for roots, but that functors, including affixes, display a different set of properties, to which I turn shortly.

In Borer (2005a, b), I propose that roots are effectively an indexed place holder, and that the index, specifically, is phonological. Sharpening this claim somewhat, I will assume that an array of (pure) phonological indices is made available for merge, and that what we call “root” is an instance of such merger, licit precisely where no formal information, syntactic or semantic, is otherwise required. The notation \( \pi \sqrt{ \text{CAT} } \) thus now should be taken to mean a phonological index that may be available at merge, and which, under certain circumstances, would spell out as /\(\pi\)cat/. Seeking to make more specific what a phonological index is, I take it to refer to a packet of root-related phonological information. Such a packet can be trivial, of course, as indeed it would be in the case of \( \pi \sqrt{ \text{CAT} } \), where, to the best of my knowledge, realizations are exactly restricted to /\(\pi\)cat/. In other cases, however, the realization information may be quite rich. More concretely, I assume such information to be specific enough to exclude the possibility that suppletive forms such as e.g. /\(\pi\)go/ and /\(\pi\)went/, or /\(\pi\)die/ and /\(\pi\)kill/, are realizations of an identical root (and see Chapter 8 for discussion). It would, of course, also exclude the existence of QPD or PQD as alternative instantiations, in Semitic, of the root \( \pi \sqrt{ \text{PQD} } \). The phonological information nonetheless is abstract enough to allow a single root to spell out as /\(\pi\)catch/ or /\(\pi\)caugh(t)/ in well-specified contexts, or as /\(\pi\)sing/, /\(\pi\)sang/, /\(\pi\)sung/, /\(\pi\)song/ should the context require the spelling out of such distinctions. Even more specifically, the index refers to information about phonological selection which a root may exercise in some well-defined local domains. Thus the fact that the affix N[V] may spell out as /\(\pi\)ment/ or /\(\pi\)ance/ but not as /\(\pi\)all/ in the context of \( \pi \sqrt{ \text{GOVERN} } \) emerges as a local phonological selection property of the root, a matter I return to in some detail in Chapters 6–8. Crucially, however, I will assume that the phonological indices under consideration, “roots”, are not associated, as such, with any Content, a matter I discuss in detail in Chapter 9. Even more crucially, roots are devoid of any
syntactic or formal-semantic properties, which I take to mean that they are devoid of any markers or properties which translate into a rigid designation, the latter by necessity, in XS, a piece of structure—no category, overtly or covertly marked, no inflection, covertly or overtly marked, no quantificational properties, and no operator-like properties of any kind.\footnote{Thus note that although agreement, e.g. as on an adjective, conveys neither Content nor formal semantics, it is triggered in the context of particular syntactic categories, and hence is a marker of such a category and may not be associated with roots.} Given the architecture of the grammar, the inventory of positions in which such objects, otherwise devoid of syntactic or semantic properties, may merge and still result in a converging derivation is limited, and so, de facto, this would serve to delimit the range of not only classical syntactic structures, but also traditional combinatorial WF operations, a matter I return to in Chapter 6, section 3.

One might wonder about the source of the relevant inventory of phonological representations such that they may be roots and specifically, whether the relevant inventory emerges from a fixed listed pool. The answer, however, is that while packets of phonological information may form a cluster, and thus would be listed, such listing is not necessary, and the “inventory” of potential roots consists, in actuality, of all phonological strings that could give rise to phonological well-formedness. In principle, then, a syllable such as /\pi bab\pi già/ or for that matter the syllabic string /\pi bábabàga/ may merge as a root if once associated with a category and structure, the output is well-formed phonologically (and thus a ba, a pretty ba, bas, to ba, baing, baify, as well as a (pretty) bábabàga, having bábabàgad, bábabàgàtion, etc.). Any resulting anomaly would not be associated with the merger of ba or bábabàga, or from any of the resulting syntactic or phonological properties. As Jabberwocky tells us, the anomaly wouldn’t even be semantic, as such, insofar as an expression such as every bábabàga merged with some ba has fixed rigid semantics, as does the expression I wanted to bábabàga the car, but it didn’t ba out. The anomaly, rather, would emerge from the fact that none of the possible domains in which /\pi bab\pi già/ or /\pi bábabàga/ are contained would return any Content. The only difference, then, between baify and nation would not reside in the properties of the root, in both cases never corresponding to Content as such, but from the fact that nation does correspond to Content, but not so baify. I return to these matters in some detail in Chapters 8 and 9. I note now, in anticipation of the discussion in the rest of this book that insofar as it would emerge as an advantage to derive all categorial and Content occurrences of e.g. /\pi round/ or /\pi siren/ from the same root, and insofar as “\pi siren” or “\pi round” may turn out to be no more than packets of phonological information, one of the fundamental tasks of this work would be to convince the reader that what is, in actuality, no more than a convention intended to preserve phonological faithfulness could be converted into a meaningful building block in accounting for the properties of words.

Subsequent to Borer (2005a, b), and specifically within approaches that subscribe to a syntactic approach to complex words, a number of accounts have emerged which divorce Content from roots altogether.\footnote{Within Distributed Morphology, roots do have Content, minimally consisting of selecting an internal argument, and at times considerably more. I return to this matter in Chapter 8.} Thus Acquaviva (2008b) proposes that
roots are, indeed, indices, but not phonological ones (and see also Harley 2009c). His roots, then, retain some constancy across their occurrences, but that constancy cannot be described in either phonological or Content terms. An even more radical proposal is put forth by De Belder and van Craenenbroeck (2011), according to which roots correspond to a radically empty structural position. Finally, Ramchand (2008) proposes that roots, altogether, are structurally superfluous and that both Content and what I have referred to as P-RaD correspond to structural configurations which are, so to speak, “headless” in the relevant sense. I return to a fuller review of these proposals in Chapter 8. Fundamentally, I will argue, the reason for a phonological index stems from the need to maintain specifically phonological faithfulness. It is against that criterion that I will evaluate other proposals, to reach what I believe is the empirically and formally optimal formulation.30

1.5 Functors, Preliminary

1.5.1 Two kinds of functors

Alongside roots and distinct from them, I assume the existence of a finite, UG-defined list of functors, where a functor defines a rigidly designating function, and where by rigid designation I mean a function whose value is constant in all possible worlds.31 Within the set of rigidly designating functions we find, for instance, determiners, tense markers, plural marking and classifiers (the latter by assumption a count function), auxiliaries, quantifiers, cardinals, aspectual markers including aspectual prefixes and some particles, modals, complementizers, negation, evidentials, switch reference markers, and pronouns and so on. I further assume this class to include categorial derivational affixes eventually to be realized as -tion, -able, en-, or -ship.32

Functors, I suggest, fall into two very distinct types along at least syntactic and semantic lines, and potentially phonological lines as well, although the latter is in all likelihood a consequence rather than a basic property. Members of the class which includes, e.g., determiners or past tense, and which are typically assumed to be linked with Extended Projections, correspond to some semantic formulas and merge, syntactically, as modifiers. I will refer to them as S-functors. An S-functor is a relationship between some semantic range and a syntactic position with an open value where the semantic range is realized. THREE, to illustrate, is an S-functor that assigns range to, or values, a syntactic position (call it #), a relationship that will be notated as THREE#. Insofar as THREE# and FOUR# are semantically related, such

30 It is perhaps worth noting here that the existence, or lack thereof, of a phonological index as a faithfulness-ensuring device is independent of the question of early or late insertion. Certainly, an early merger of a phonological index ensures faithfulness, but such faithfulness can be likewise achieved if an identical phonological form is associated with all occurrences of the same root index, however otherwise linked and even if such association is late. For more discussion of this point see Chapter 8.

31 In thus defining functors I follow an informal suggestion in Gajewski (2010).

32 Non-categorial derivational affixes, notably English prefixes, are a harder class to characterize, and, like prepositions, are in all likelihood a mixed bag. Some characterizations and some open questions concerning prefixes are in section 6 of Chapter 7.
relatedness is mediated through the fact that they are (effectively) operators ranging over the same type of open value.

In contrast, functors which ultimately spell out as /ation/ or /able/ define primarily a syntactic function whose role is, effectively, to divide the categorial space. It is, thus, a relation between a projecting categorial node, and a particular Categorial Complement Space (CCS), and by Category here I refer to a member of the traditional “lexical” category set N, V, A, and possibly Adv and P. Potentially, some such functors may also have a semantic function (-able is a clear case), but as I shall argue, such a semantic function is neither necessary nor sufficient to define this type of functor. I will refer to them as categorial functors, or C-functors. To illustrate, -able is a C-functor that projects A and defines its CCS as (equivalent to) V, and is hence an instance of $C_{A[V]}$. We note that the designation $C_{A[V]}$ is not unique, and an identical designation characterizes, e.g., -ive. Likewise, a representation such as $C_{N[V]}$ would characterize, at the very least, -ing, -er, -ation, -ment, -al, -ance(y), -ence(y), as well as -age and -ure and possibly others. Concerning such cases, they consist, as I will suggest, of two rather distinct sub-cases. Some represent distinct spellout possibilities for the same function. Such, I will suggest, is the case for -ation, -ment, -al, and -ance(y)/ence(y), as well as possibly -age, all of which involve an otherwise semantically bleached function which could be well described as (a pure) $C_{N[V]}$. That is not, however, the case when we consider -able and -ive, precisely because -able, but not -ive, comes with a modality interpretation. Insofar as -ive does appear bleached of any particular semantic value, we can think of it as a spellout of $C_{A[V]}$. Insofar as -able does come with an additional semantic function, we can think of it as ABLE$A[V]$, and with ABLE naming the relevant semantic function. Similarly, of course, ER$N[V]$. In Chapter 4 I will suggest that -ing, when a nominalizer, has well-defined aspectual properties not shared by the -ation and kin group (henceforth ATK for -ation and kin), making it, by the same logic, ING$N[V]$. Importantly, and as I shall show, in contrast with S-functors, C-functors merge and project along conservative lines. A first approximation of the structure of what is eventually to spell out as, e.g., / readable/ or /crystallizable/ is in (9). Note that by virtue of having a V-equivalent Categorial Complement Space, CCS, ABLE$A[V]$ will render the roots $\sqrt{\text{read}}$ or $\sqrt{\text{verit}}$, otherwise by assumption devoid of category, V-equivalent (C=V), and that the same would be the case for crystallize. That the latter is already V (by virtue of the presence of ize, itself a spellout of $C_{V[N]}$) is, we note, of little consequence,

33 In earlier versions of this system, S-functors are referred to as F-functors while C-functors are referred to as L-functors. While the previous notation certainly corresponds to commonly used labels (F for functional categories, L for “lexical” categories), I opted, at the risk of confusion, to relabel the F/L distinction, which under the present execution is at best a misnomer, and rather invoke the C- vs. S-selection distinction, originally due to Grimshaw (1979), as it seems to correspond considerably more accurately to the actual properties of the functions under consideration. A valid question concerns the division of labor here, and specifically, why should it be the case that S-functors correspond to the non-terminal nodes of Extended Projections, while C-functors should reside at the “bottom” of such Extended Projections. The matter is taken up in section 3 of Chapter 6.
as V is, trivially, V-equivalent (and see section 4 of Chapter 6 on linearization as well as on the adjunction structure in (9). Shaded italics for silent copies):

\[
\begin{align*}
(a) & \quad \text{ABLE}_A \\
\text{ABLE}_A & \quad \text{ABLE}_A \quad \text{ABLE}_A \quad \text{ABLE}_A[\pi] \\
\text{ABLE}_A & \quad \text{ABLE}_A[\pi] \\
\text{ABLE}_A[\pi] & \quad \text{ABLE}_A[\pi] \\
\text{ABLE}_A[\pi] & \quad \text{ABLE}_A[\pi] \\
\text{ABLE}_A[\pi] & \quad \text{ABLE}_A[\pi] \\
\text{ABLE}_A[\pi] & \quad \text{ABLE}_A[\pi] \\
\end{align*}
\]

In Chapter 6, I return to an in-depth discussion of the syntactic, semantic, and phonological properties of C-functors; indeed, to a detailed justification of their independent existence.

1.5.2 Category labels—a clarification

It is worthwhile pausing briefly to elucidate the formal nature of categories, clearly a fundamental task given the claim that it cannot be taken for granted that terminals, as such, come with (lexical) categories. From this perspective, consider again C-functors, by assumption encoding a relationship between some projecting “lexical” category label, N, V, A, or possibly P and Adv as well, and its Categorial Complement Space (CCS). Suppose we pursue the spatial analogy, whereby C-functors divide the categorial space. ABLE_A[V], then, creates a categorial space as in (10), where the V-space is fully contained within the A space, and where, by assumption, such containment corresponds to the hierarchical configurations in which following the merger of A and its complement constituent, it is A that projects:

\[
\begin{matrix}
A \\
\text{V}
\end{matrix}
\]

If we take the relevant case under consideration to be that of e.g. [A[\pi]realiz] able), the categorial labeling as well as the categorial function of C-functors appear clear and consistent enough. Consider, however, the configuration \([C=V\pi\text{read}]\) in the structure in (9), by assumption a case of V-equivalence. What, exactly, is the notion of V-equivalence, such that it applies to \([C=V\pi\text{read}]\), and such that it could be made to be one and the same as the categorial spatial division in (10), given the fact that the V-ness of read appears, at least prima facie, to be of a very different nature than that of e.g. \(C_{V[N]}\) when spelled out as /\pi/ize/, as in realize?

Viewed differently, consistency emerges precisely from the assumption that \([C=V\pi\text{read}]\) is not V, but rather, it is V-equivalent. Specifically, we note that the
V-ness of the CCS of ABLE$_{A[v]}$ should, and typically could, be established on the basis of its availability to merge with something which already has clear verbal properties such as realize or classify, constituents which are verbal by virtue of being headed by an instance of C$_{V[N]}$ or C$_{V[A]}$ realized as /ize, ify/. From this perspective, then, \(\pi\text{read} \) is V-equivalent in (9) not by virtue of having become V but by virtue of having come to occupy a syntactic V-space, and by virtue of such a syntactic V-space having particular well-defined properties. Computationally speaking, the inner box in (10), the CCS, defines an equivalence class: in the context of e.g. ABLE$_{A[N]}$, classify, realize, and \(\pi\text{read} \) are V-equivalent. There is, then, a single notion of N, V, or A in this system, as defined exclusively by C-functors. What the system does allow for beyond explicit category labels, however, is the emergence, in structurally well-defined contexts, of equivalence classes, the latter specifically defined as the complement space of otherwise projecting categorial labels. For otherwise category-less roots, such categorial equivalence is the sole way in which they come to “have” a category, be it V, as in readable or to read, or N as in the good read.

Yet another central issue of labeling is in need of sharpening. In the vocabulary of present-day syntactic approaches, the term “category” is in reference to a label of a particular sort which identifies a constituent. By common assumption, categories can be divided into two rather distinct pools. Those in (11a), typically referred to as “lexical”, and those in (11b) typically referred to as “functional”:

    b. D, T, ASP, #,…

The reservoir of “lexical” categorial labels is thus named because, typically, any N label includes some lexical element which, by common wisdom, is N. Notwithstanding the validity of this common wisdom, it is reasonably well established that there do exist grammatical constituents, however headed and categorized, which we can usefully refer to as NP, AP, and so on. While the existence of functional elements such as determiners or tense markers is certainly well established and not much in dispute, what continues to be in dispute is the claim that any or all such elements are heads (in whatever sense) which project and give rise to a discrete maximal projection. The controversy, as it stands, reflects several factors. “Lexical” categories constitute an extremely small set (N, V, A, and possibly, but not clearly, some instances of P and Adv) which define constituents with reasonably clear—and distinct—distribution. By contrast, and according to some executions, functional projection lines may consist of independently projecting features, each with its own label, of which there may be anywhere between three and thirty in any one projection line. And yet, the sense in which each of these presumed constituents can be distinguished from those directly embedded within it or directly dominating it is not always clear. What, for instance, is the evidence for the existence of #P (QuantityP) within DP, given the fact that both, perforce, dominate some projection of N and have the distribution of what we may broadly call a referring nominal? What, specifically, would go structurally
wrong, if grammatical aspect (\(g\)-asp) is not an independently projecting node, but a modifier of T?\(^{34}\)

The matter, up to a point, is theory internal. In the execution to be adopted here (see below as well as Chapter 6, section 3), some functional labels are assumed, although, as should become clear from the ensuing discussion, their “categorial” properties, such as exist, are entirely derivative from their semantic function. Even more importantly, and as will be outlined in detail in Chapter 6, section 3, the fundamental property of functional structure, so called, is the fact that functional nodes constitute segments of Extended Projections—ExP-segments. As such, they are, in actuality, not entirely categorially independent of each other, nor, arguably, are they independent of whatever lexical category may reside at their core, their C-core (see below). It thus emerges that there is, and there needs to be, a fundamental distinction between the type of labeling associated with “C” elements, and the type of labeling associated with segments of Extended Projections. A labeled string such as (12) for, e.g., the three classifications, in other words, is up to a point guilty of obscuring the formal distinction between labels such as N and V, on the one hand, and labels such as D and #, on the other:

\[
(12) \quad [D \quad \# \quad [\text{DIV} \quad [V \quad \text{[N\text{CLASS}]}, \quad \text{C}_{V[N]}, \quad \text{C}_{N[V]}]]]
\]

While a formally accurate notation which represents the distinction would be extremely useful, expositional ease militates against such a change, and hence it has not been attempted. As should become clear from the next few subsections and the discussion in Chapter 6, however, the distinction espoused in this work between the set of “lexical” labels in (11a) and the set of “functional” labels in (11b) is formal and substantial.

1.5.3 S-funcors as range assignors

The properties of S-funcors are discussed at some length in Borer (2005a, b), where their role is pivotal in the emergence of (so-called) functional structure. Some aspects of that discussion are summarized below, although the alert reader would no doubt spot some changes in both substance and execution.

\(^{34}\) To illustrate, suppose we assume, as seems plausible, that there is a semantic dependence between Tense and grammatical aspect (\(g\)-asp). Suppose we even grant that there exists a relevant semantic overriding consideration which forces Tense to scope over \(g\)-asp rather than the other way around, and hence for Tense to dominate \(g\)-asp (although, note, c-command direction is already an independent stipulation on how semantic scope translates into syntactic architecture). Even so, there are at least three different syntactic ways to represent that dependency while maintaining the typologically valid observation that when T and \(g\)-asp co-occur, the latter is dependent on the former. One would be to assume that \(g\)-asp is a semantic complement of Tense. The second would be to merge \(g\)-asp as a specifier of Tense (and with T possibly raising to a higher position). The third, finally, would consist of a relationship between the head of the Tense Phrase, \(T^\text{min}\), and the head of the \(g\)-asp Phrase, \(g\)-asp\(^\text{min}\), however stated, through head to head movement, feature matching, Agree, or what have you, but specifically no complementation relationship as such.
Taking functional structure, as typically understood, as our starting point, and observing that functional nodes are always ExP-segments, we note as our starting point that the grammar as it now stands gives us no way to determine the specific internal architecture or the relative order of such ExP-segments. Crucially, notions such as head, complement, and specifier were developed to describe properties of (lexical) categories, capturing what were assumed to be lexically specified or lexically-grammatically meaningful relationships, such as selected arguments, external arguments, and so on, and hence they do not carry over in a straightforward way to Extended Projections, nor is there any particular reason why we should assume them to be meaningful in that domain (and see fn. 34 for a relevant illustration). On the other hand, the existence of at least some structure within Extended Projections as well as the fixed hierarchical ordering of at least some ExP-segments with respect to each other can be empirically substantiated. Suppose we assume, then, that at least some properties of Extended Projections are inevitable and universal. Suppose we further assume that at least one such property which Extended Projections share with C-functors is transitivity. More specifically, and taking an Extended Projection to be the maximal set of consecutively merging ExP-segments, that set defines a Categorial Complement Space, where by Category, again, we refer to a “lexical” inventory. It is, in fact, precisely this transitivity that is responsible for the obligatoriness (and the uniqueness) of a “bottom”, so-to-speak, to any Extended Projection that consists of a “lexical” categorial label, as the term is typically construed, or, in the terminology used here, a core consisting of some C-labeled item, call it C-core, and where such a C-core is fundamentally formally distinct from ExP-segments.35

I will further assume that ExP-segments (excluding the C-core) fundamentally correspond to semantic functions, and that their availability as well as their order relative to each other within each Extended Projection is universally fixed. Differently put, insofar as we can substantiate the existence, in any grammar, of $D \llbracket CL \llbracket N$, then the ExP-segments D, #, CL are universally available in every grammar as part of the inventory of ExP-segments which select, or effectively define, a nominal C-core. Furthermore, their merge order relative to each other is fixed (i.e. D must merge

35 (i) Extended Projection$_{ad}$:
   a. There must be a unique C-core such that it is dominated by all segments of the Extended Projection (ExP-segments);
   b. The relative order of merger of ExP-segments within any Extended Projection is universally specified;
   c. Subject to A, every ExP-segment is optional, but its presence/absence may have interpretational consequences.

(ii) C-core$_{ad}$:
   a. α is a C-core iff α is C-equivalent and there is a β such that β is contained in α and β is intransitive, and for all x, α dominates x and x dominates β, x is C-equivalent;
   b. α is maximal iff there is no γ such that γ is C-core and γ immediately dominates α (and where C stands for the traditional inventory of ‘lexical’ categories. Note that trivially, all instances of C are C-equivalent).

See Chapter 6, section 3 for a more complete discussion of Extended Projections.
The reader should note that at least some of the fixed properties of Extended Projections assumed here should be viewed primarily as heuristic devices. This is to say that such properties are not necessarily axiomatic or innate as such—ultimately, it may very well turn out to be the case that they could be derived from grammatical or, for that matter, extra-grammatical principles. Once such principles are in place, it may also turn out to be the case that they may vary across grammars, or even internal to any one particular grammar. Pending the discovery of such entailments, however, it appears heuristically preferable to simply fix at least some of the properties of Extended Projections as we descriptively know them to be the case, and to proceed to investigate other properties on that basis.

Consider now the following paradigm:

(13) a. During the summer, water in the pond mostly evaporates.
    b. Hummingbirds always die young.

(14) a. Water in the pond is mostly lost through evaporation.
    b. Hummingbirds always drink from our birdfeeder.

The examples are familiar and represent cases of so-called unselective binding (see Lewis 1975, Heim 1982, and Doetjes 1997, among others for some relevant discussion). Of particular importance from the perspective here is the well-known fact that the adverbs of quantification in (13)–(14) may range either over the interpretation of the event (a reading most salient in (14)) or over the interpretation of the subject alone. Even more crucial, from our perspective, is the fact that the readings are mutually exclusive. Setting aside the specific reasons for the difference in the preferred reading for (13)–(14), we note that even if it were plausible that all hummingbirds in the world drink from our birdfeeder, under that reading it wouldn’t necessarily imply that they are constantly doing so. Likewise, (14a) cannot mean that most water is mostly lost. Finally, under the nominal reading, the DP under consideration cannot include any other quantifier. Examples in (15), under the relevant reading, are ungrammatical (i.e. the adverb of quantification can only range over the event):

(15) a. Most/all hummingbirds always die.
    b. Most/all water in the pond mostly evaporates.

It thus emerges that adverbs of quantification, when associated with a nominal expression, are in complementary distribution with DP-internal quantification. In the discussion of this paradigm in Borer (2005a), I concluded that such complementary distribution emerges from the fact that under the relevant reading, the adverb of quantification values, or assigns range, in some syntactically and semantically well-defined sense, to some functional structure within the DP, a relationship,
I assume, which falls under some version of syntactic binding. It is precisely because the adverb assigns range to some otherwise unspecified value within the nominal, that a DP-internal quantifier may not do so and is hence obligatorily excluded, under the assumption that these would constitute cases of vacuous quantification. Clearly, a DP-internal quantifier and an adverb of quantification are not in structural competition concerning their specific domain—one is internal to the DP and the other clearly external to it; nor do the two clash when the adverb modifies the event. Where the competition does occur, however, is relative to the presence of a single value in need of being provided. If it is bound by the adverb, a DP internal quantifier may not occur. If it is bound by a DP internal operator, the adverb must seek to assign range elsewhere, i.e. within the domain of the event. From this perspective, however, it emerges that the head which is interpreted as most within the DP in either (15b) or (13a), say the # head, is best viewed as an open value, and its binder is best viewed as merging elsewhere. This picture thus contrasts with one in which most would itself merge within the DP and project # directly. It further suggests that # (for quantity) is not a singleton, but a pair consisting of a binder and a bindee.

An illustration of the same point is available from cases such as (16):

(16) a. the dog’s ear
   b. a dog’s ear

As is well known, (16a) is a definite description, but (16b) is not. Furthermore, as is equally well known, an additional article is barred in (17) (note that all possible combinations of definite and indefinite articles are blocked):

(17) a. *[the/a dog’s] the/an ear
   b. *the/a [the/a dog’s ear]

How, specifically, does the dog’s ear become a definite description, with properties identical, for all intents and purposes, to those of the ear? Under most current accounts, the dog or a dog occupy some specifier within the DP structure. Opinions may vary regarding where ’s is, but we note that whatever the properties of ’s and regardless of where it lives, it certainly cannot be responsible for rendering (16a) definite or (16b) indefinite. Rather, it appears we have here a case of the (in)definiteness of the possessor translated to that of the head, corresponding directly to the non-availability of any direct marking of definiteness for the head itself. Yet again, this picture receives a natural explanation if we assume that the (in)definiteness value of the specifier perforce binds some head within the nominal Extended Projection, and that in this manner, it transfers to that head its (in)definiteness value, resulting in the appearance of agreement in (in)definiteness (cf. 16a) as well as the impossibility of overt articles. Yet again, the picture suggests that ExP-segments are headed by open values, and that cases such as (17) are ruled out due to the presence of two range assignors competing for a single open value to bind.  

37 Importantly, note, this case also shows that the relationship of range assignment is not that of logical variable binding. If we take THE to be a discourse anaphor, then it is clear that when dealing with the dog’s
The concrete formulation of this proposal in Borer (2005a, b) postulates heads of ExP-segments such as # and D as open values with a specific categorial label. The open values are in turn bound by S-functors which assign range to them, which translates into the statement that the range of the relevant functor is delimited by the specific syntactic position it binds. Suppose we consider the open value in cases such as (13)–(14) to be that which projects as #P, notating such an open value as \( \ll e \gg \).

Most, as well as mostly, in turn, define a rigidly designating S-function which assigns range to \( e \), and therefore MOST\(^e\), MOST(ly)\(^e\).

\[
\begin{align*}
\text{(18) a.} & \quad [\#] \ll e \gg \ldots \ll e \gg [C=N] \\
\text{(18) b.} & \quad [\#] \text{MOST}^e \ll e \gg \text{MOST}^e [C=N] \\
\text{(18) c.} & \quad \text{MOST(ly)}^e \ll e \gg \text{MOST(ly)}^e [C=N]
\end{align*}
\]

Note now that insofar as the S-functions MOST and MOST(ly) are specified to assign range to #, the categorial specification of # on the open value appears redundant and we are free to assume that it is inherited from the range assignor. In that case, what in actuality is part of the numeration and which merges and eventually projects is an empty set, which is licensed and effectively categorized by an S-functor (see Chapter 6 for discussion).

The properties of the dog’s ear vs. simply the ear or the dog can be accounted for in similar terms, as illustrated by (19). To be explicit, we note that the possessor DP here is not a functor as such, and its ability to bind the open value of its head stems from some form of specifier-head agreement, however stated (see fn. 37). It is thus the definiteness value or feature of the entire DP in the specifier that is effectively copied onto the \( \ll e \gg_D \) of the head:

\[
\begin{array}{c}
[\text{D–1}] \ll e \gg_D \ll e \gg_D \ll e \gg_D \ll e \gg_D \ll e \gg_D \ll e \gg_D [C=N_2(\text{dog’s})] \\
\text{[D–2]} \ll e \gg_D \ll e \gg_D \ll e \gg_D [C=N_1(\text{ear})]
\end{array}
\]

Note now that the notion of “head”, as it emerges from the previous discussion, deviates architecturally from what is typically assumed by canonical phrase structural accounts. Specifically, in e.g. (18b) or (19), the syntactic head of # and D respectively—the element that projects—is the open value, an empty set. Viewed differently, however, the duality of the open value and its range assignor amounts to separating the syntactic portion of the structure from its semantic function, allowing us to generalize over occurrences of the former despite distinct semantic contexts. Within

ear, what is being copied onto ear is not the discourse antecedent of the dog. Rather, it is the formal properties of THE/DEF, thus enabling it to seek its own, separate, discourse antecedent.

The argument can, in actuality, be made considerably stronger if one accepts, as in Borer (2005a), that indefiniteness is but the failure of definiteness, and that the indefinite expression a dog’s binds # but not D. As the must merge in #, the binding of the open range in # by a dog blocks the merger of the in spite of the fact that the semantic value of the two is different. The reader is referred to Borer (2005a) for a fuller discussion.

\footnote{In seeking to avoid confusion with the notation of Type Theory, the notation \( \ll e \gg \) replaces the \( <e> \) in Borer (2005a, b).}
the system as so far outlined, it is the open value that projects, giving rise to a constituent, and it is the open value that constitutes an ExP-segment. By this logic, \( \ll e \gg_{g}, \ll e \gg_{T}, \ll e \gg \), are pieces of structure, and MOST, EVERY, THE, MAY are semantic functions that are responsible for the interpretation of that structure. In this system, what, e.g., MOST and EVERY have in common is that both can assign range to an open value that is (or that would thus become) \( \ll e \gg_{g} \). What MAY and MUST have in common is, likewise, the fact that they assign range to the same open value and so on. In and of itself, however, MOST# is not # nor is WILL\( ^{\dagger} \) an instance of T. Indeed, they have no syntactic category at all.

MOSTLY is an adverb, and [the dog] in (19) is a phrase in a specifier position. Where, however, do the and most merge? An attractive possibility would be to claim that they are specifiers, all the more so since range assignment from specifiers is explicitly assumed. However, even though for both the and most this is a viable solution, in other contexts it is entirely clear that (overt) range assignment must be allowed to co-exist with otherwise filled specifiers. In lieu of postulating two specifiers and restricting the distribution of S-functors to the innermost one, and in line with the account in Borer (2005a), suppose THE, MOST, and similar S-functors merge directly with the open value which they assign range to as modifiers: non-projecting instances of min/max.

Supposing this to be on the right track, heads of ExP-segments emerge as possible pairs in which one member projects and provides an open value, while the other provides the range assigned to that value. As expected, it is precisely the latter one which is optional, insofar as range assignment can come, as we saw, from an adverb or a specifier. We can thus assume the structure in (20), for some \( \ll e \gg \) with \( S^{X} \) as its range assignor, and with the circled portion of the structure to be referred to henceforth as “head-pair”. Following range assignment, the open value acquires the value S (by assumption the semantic range S). It also acquires a categorial label (X) which, in this context, we will take to be a syntactic way of encoding the fundamentally semantic common denominator of the array of S-functors that may assign range to it, all functors of the type \( S^{X} \) (e.g. all quantifiers, and hence \( S^{g} \), all instances of tense and hence \( S^{T} \) and so on):

(20)  
\[
\begin{array}{c}
X^{\text{max}} \\
ZP \\
\circled{S^{X}} \ll e \gg \\
\end{array}
\text{HEAD-PAIR}
\]

1.5.4 S-functors and phonological indices

As it turns out, THE and MOST, as well as other cases mentioned thus far, have at least one property which does not necessarily carry over to all S-functors. Both THE and MOST—as is also the case for English cardinals and quantifiers, for modals, etc.—are associated with a unique phonological realization. Importantly, they do
not display the sort of phonologically erratic behavior exhibited by, e.g., past tense or plural, and their phonological realization is entirely immune to any neighborhood effects. We would thus be justified in assuming that they spell out in isolation from their context, and we may thus assume that they come with their own index which regulates their realization possibilities.

However, this is by no means the case for all potential range assignors, nor is this in any way a universal situation. Rather, if we take, e.g., English past tense, or English plural marking to be range assignors and hence $S$-functors, their phonological realization, as already noted, is not only not unique, but is also highly contingent on their immediate environment. In the context of *mouse* (however represented), plural marking ends up as */$_m$ mice/*, in the context of *child* as */$_c$ children/*, and in the context of *girl* as */$_g$ girls/*. We already noted in section 1.3 that such cases are best viewed as subject to late phonological realization. As is patently clear, there is little advantage in associating them with an independent phonological index, for the simple reason that such a phonological index would either have to be effectively vacuous, or require massive subsequent modification. Rather, and in line with a realizational approach, I will assume that the phonological form */$_m$ mice/* is a mono-morphemic realization of $[C_N$N $\sqrt{\text{mouse}}]$ in the context of plural marking, and that furthermore, */$_g$ girls/* is similarly the mono-morphemic realization of $[C_N$N $\sqrt{\text{girl}}]$ in the context of plural marking.

Suppose we assume then that plural and past tense are abstract, in the sense that they do not come with a unique phonological index. In being abstract $S$-functors, they are distinct along phonological lines from, e.g., THE or CAN. We now note, empirically, that the eventual phonological realization of any marking associated with such an abstract $S$-functor (henceforth “$S$-marking”) is directly contingent on the availability of some phonologically indexed host, in conjunction with which it could be realized, and that this is true regardless of the specific realization of past as “regular” or “irregular”. It is in turn the need for such a phonological host for $S$-marking, I suggest, which is one of the chief forces, if not the only one, of head movement.

---

39 While great phonological stability is attested for quantifiers, determiners, and modals, that is not the case for auxiliaries, raising the possibility that while e.g. realizations such as */may*, */might*, */four*, */every/* etc. are accessed through phonological indices on a par with roots, this does not apply to e.g. the auxiliary be in English, where suppletion is rampant, and where phonological realization would have to be otherwise determined, presumably through whatever late insertion mechanism is also responsible for pairing $C_N[v]$ with multiple phonologically unrelated realizations. For some discussion of suppletion, see Chapter 8. See also Embick and Halle (2005).

40 We note that it cannot be the case that ExP-segments must be phonologically realized to be licit, and that e.g. no such local phonological realization is available in the case of mostly or for possessors such as *the dog’s ear*. Even more radically “empty” ExP-segments emerge when we consider cases of zero-realized tense as discussed extensively in Déchaine (1993b) for Chinese as well as for Haitian and a range of African languages. Regarding all such cases, it is rather implausible that an $S$-functor merges with the head. Alternatively, these are cases where range is assigned to an open value through the mediation of a discourse antecedent, and with the latter functioning, in this respect, exactly like an adverb of quantification. A head-pair, then, is never formed. If a discourse antecedent is at work here as is typically assumed, and insofar as it is clearly necessary for $T$ to be bound by some sentence-external element, it provides independent evidence for the availability of empty heads for functional structure which, in turn, can be licensed from without.
Consider, in view of this, the representation of plural-marked derivations in English, depicted in (21), and assuming plural marking to be the spellout of the S-functor DIV, assigning (non-singular) range to a nominal ExP-segment, thereby turning it, effectively, into CL (in the sense of Borer 2005a). As should be clear from the structure in (21), and given the abstract nature of DIV^{\text{CL}}, there is little to prevent \([C=N, xyz]\) (effectively N{\text{max}}) from (internally) re-merging with N{\text{min}}. By common assumptions, we note, such re-merger of the head would only be licit if the head retains its categorial status, as well as its projection status (see Ackema, Neeleman, and Weerman 1993, as well as Georgi and Müller 2010). Even more strikingly, however, nothing would prevent the re-merged head from accepting whatever S-marking is associated with the abstract S-functor, giving rise to the emergence of a constituent which projects as N, but which is range marked, specifically, as N^{\text{DIV}}.41

\[
\begin{diagram}
\text{ZP} & \xrightarrow{N^{\pi\sqrt{XYZ^{\text{DIV}}}}} & [N^{\pi\sqrt{XYZ^{\text{DIV}}}}] \\
& & [N^{\pi\sqrt{XYZ^{\text{DIV}}}}] \\
& & [C=N^{\pi\sqrt{XYZ^{\text{DIV}}}}] \\
\end{diagram}
\]

The output of such movement, for an array of both roots and non-roots, is in (22):

\[
\begin{align*}
\text{a.} & \quad [N^{\text{DIV}}] \xrightarrow{\text{DIV}^{\text{CL}}} \ll [C=N^{\pi\sqrt{\text{tooth}^{\text{DIV}}}}]_{\text{CL}} \ldots \\
\text{b.} & \quad [N^{\text{DIV}}] \xrightarrow{\text{DIV}^{\text{CL}}} \ll [C=N^{\pi\sqrt{\text{woman}^{\text{DIV}}}}]_{\text{CL}} \ldots \\
\text{c.} & \quad [N^{\text{DIV}}] \xrightarrow{\text{DIV}^{\text{CL}}} \ll [C=N^{\pi\sqrt{\text{bird}^{\text{DIV}}}}]_{\text{CL}} \ldots \\
\text{d.} & \quad [N^{\text{DIV}}] \xrightarrow{\text{DIV}^{\text{CL}}} \ll [N \text{indictment}^{\text{DIV}}]_{\text{CL}} \ldots 
\end{align*}
\]

It thus emerges that postulating empty heads for ExP-segments across the board allows us to considerably narrow the grammatical gap between “hot” and “cool” languages, to use the terminology originally proposed in Huang (1984) in the context of the discourse-licensing of grammatical structures.

We note, likewise, that insofar as S-functors may either be abstract and thereby trigger movement, or correspond to phonological indices, where movement is not required, this is an aspect of grammatical variation, both inter- and intra-language, which is reducible not only to the properties of functional vocabulary, but to the phonological properties of functional vocabulary (see concluding comments in Chapter 13 for some discussion). Contrary to appearances, however, and while it remains the case that in the absence of movement the derivation will crash for phonological reasons, the movement in itself is not assumed to be phonological. See Chapter 6 for some additional discussion.

41 Some aspects of the derivation are glossed over for ease of exposition. Specifically, I assume that the head re-merges and that the relevant S-functor adjoins to it subsequent to such movement, creating the adjunction structure in (21), where it is the head, rather than the S-functor, which proceeds to project. ZP, if present, merges subsequent to that.
The result of the movement, as is clear, provides us with a constituent which is
directly marked by the relevant range. A root embedded within such N is a phono-
logical index, by assumption a packet of information concerning the realization of the
root in distinct contexts. It is thus precisely there that information could be located
indicating that \( \sqrt{\text{tooth}} \) would spell out as /\( \pi \)teeth/ and that \( \sqrt{\text{woman}} \) would
spell out as /\( \pi \)women/. It is likewise exactly in this context and in the absence of any
specific information about the spellout of \( \sqrt{\text{bird}} \) that the default form /\( \pi \)birds/
would emerge. Finally, as root information is not available for \( N \text{indictment} \), being
derived, a default realization would emerge as well, hence /\( \pi \)indictments/:

\[
(23) \quad \begin{align*}
\text{a. } & \angle_\text{C} \angle_N \sqrt{\text{tooth}} \angle_\text{DIV} \rightarrow /\pi \text{teeth/} \\
\text{b. } & \angle_\text{C} \angle_N \sqrt{\text{woman}} \angle_\text{DIV} \rightarrow /\pi \text{women/} \\
\text{c. } & \angle_\text{C} \angle_N \sqrt{\text{bird}} \angle_\text{DIV} \rightarrow /\pi \text{birds/} \\
\text{d. } & \angle_\text{C} \angle_N \text{indictment} \angle_\text{DIV} \rightarrow /\pi \text{indictments/}
\end{align*}
\]

The resulting syntactic configurations in (22) and their spellouts in (23) are in turn
a specific (alternative) execution of the claim put forth in Anderson (1982, 1992) as
well as Beard (1995), according to which formations such as English plural or past
tense, and in general inflectional marking of the type typically marked on stems, are
not morphemic, but rather represent the phonological realization of particular stems
in the context of a particular set of syntactic properties. Teeth as well as birds, under
such an account, are mono-morphemic, where by mono-morphemic what we mean,
specifically, is that teeth and birds, just like tooth and bird, are the realizations of a
single syntactic terminal which is thus in a local relation with its S-marker. As such,
then, this account is very distinct from that put forth by, e.g., Halle and Marantz
(1993), where PST or PL is a morpheme which attaches to a verb or a noun
respectively, and where by assumption any past tense or plural marking on a stem
involves, at the least, a tri-morphemic structure consisting of the root, v/n, and a
PST/PL morpheme, and hence, schematically:42

\[
(24) \quad \begin{align*}
\text{PST } & [v \left[ \sqrt{\text{SING} } \right] v ] \text{ PST } \\
\text{PL } & [n \left[ \sqrt{\text{TOOTH} } \right] n ] \text{ PL }
\end{align*}
\]

A few final comments might be in order concerning the availability, or lack
thereof, of head re-merger. Thus we proposed that an abstract S-functor forces
head movement, but have remained silent on whether head movement may occur
in the presence of a phonologically specified S-functor. The latter, presumably, would
give rise to a morphologically complex form, insofar as it would involve a case of
merger between two forms which are otherwise structurally present, each having its
own phonological index. Note that although head adjunction is not excluded in XS
(cf. (21)) this is not in actuality the structure under consideration here. Rather, the
question is whether within a head-pair, the modifying S-functor could be realized,

42 By way of anticipating a more thorough theoretical discussion in Chapter 6, note that head re-merger,
as in (22), is blocked in the presence of intervening C-functors (i.e. realize cannot be moved out of
realization), as C-functors, definitionally, do not bind empty positions and are never ExP-segments.
phonologically, independently of some C-core element that has moved to re-merge and re-project as its head-pair mate.

Cases of this nature do not seem to occur frequently. Modals and auxiliaries for example typically pre-empt tense marking, indicating that verbs do not move to T in their presence. Furthermore, stable, discrete bound S-functor morphemes, such that they plausibly have their own phonological index but nonetheless require a lexical base as a host, are rather rare. If head-pairs did systematically allow double phonological realization, such cases would be predicted to occur more frequently, if only as a result of liaison. Ultimately, however, the issue is an empirical one and at least one case, the English progressive, comes to mind where a verbal base does adjoin to a stable potential bound morpheme, -ing, and with the latter plausibly signaling some S-functor in conjunction with an aspectual phrase. Under consideration, then, would be the question whether in an expression such as be dancing, and assuming $[_{C=V}π\sqrt{dance}]$ to move, does $[_{C=V}π\sqrt{dance}]$ move to some otherwise empty head of grammatical aspect (g-asp), i.e. some instance of $<<e>>$, to give rise to the head-pair $<ING_{PROG}<<[_{C=V}π\sqrt{dance}]]_{ING}>_{PROG}$. Alternatively, the derivation might involve the assignment of range to some $<<e>>$ by ING, and rather than re-project as ING’s head-pair mate, $[_{C=V}π\sqrt{dance}]$ adjoins to ING to give rise to $<[_{C=V}π\sqrt{dance}]_{+ING_{PROG}}<<e^{ING}_{PROG}>_{PROG}>>, a position which is not subject to S-marking.

More pertinent to the ensuing discussion, and in particular that of derived nominals in Chapters 3–5, is the status of head movement in cases which involve indirect range assignment, i.e. range assignment by a specifier, as in (19), or by an adverb of quantification, as in (18c), and where a head-pair is altogether absent and where no phonological realization is otherwise associated with the relevant ExP-segment. We note that in such cases there is certainly no impediment to the re-merger of a lower head, precisely because nothing, by assumption, would be otherwise present. Pending reasons to abandon such an assumption, and wishing to make the account the strongest possible, I will assume that all these cases involve a re-merger of the head.

By way of final illustration, (25) is, in broad strokes, an Extended Projection with an N-core:

\[
\begin{array}{c}
D
\end{array}
\]
\[
\begin{array}{c}
THE^D
\end{array}
\]
\[
\begin{array}{c}
<<e^{THE}>^D_D
\end{array}
\]
\[
\begin{array}{c}
THREE#
\end{array}
\]
\[
\begin{array}{c}
<<e^{THREE}>^#_#
\end{array}
\]
\[
\begin{array}{c}
CL
\end{array}
\]
\[
\begin{array}{c}
DIV^{CL}
\end{array}
\]
\[
\begin{array}{c}
<<[_{C=N}π\sqrt{TOOTH}]^{DIV}_{CL}>^CL
\end{array}
\]
\[
\begin{array}{c}
[_{C=N}π\sqrt{TOOTH}]
\end{array}
\]
D emerges as a result of range assignment by the S-functor THE\textsuperscript{10}, giving rise to a projecting \( \ll e^{\text{this}} \gg_{D} \) \#. In turn, emerges as a result of range assignment from \textit{three}\textsuperscript{9}, by assumption in Spec\#. CL, finally, involves range assignment by the abstract DIV\textsuperscript{CL}, which requires the movement and re-merger of N. N itself, has emerged as a result of the root containing the root \( n^{\sqrt{\text{tooth}}} \) rendered N-equivalent, being the CCS of \{D, \#, CL\}. For more discussion of these issues as well as for a more detailed execution, see Chapter 6, sections 2.1 and 3.\textsuperscript{43}

1.5.5 Functors—a brief summary

To summarize the salient aspects of the functor system proposed here:

A. The functional vocabulary consists of rigidly designating items, each naming a function: functors. The inventory of functions and hence of functors is divided into two formally distinct kinds: S-functors and C-functors. All functors, by virtue of articulating a function, are transitive.

B. S-functors are semantic functions. They assign a semantic range to an open syntactic position. In and of themselves and independently of their merger context, they have no syntactic properties.

C. C-functors are (primarily) syntactic functions. They project a particular category and they define a Categorial Complement Space (CCS). In and of themselves, they need not have a semantic function.

D. In the most standard case, S-functors are modifiers—adjuncts—which do not project and are thus instances of \textit{min/max}. They merge with an otherwise open-valued projecting head and assign semantic range to it. The result is a pair, which I have labeled “head-pair”.

An open valued head, however, may be assigned range by items other than its head-pair mate, e.g. by adverbs of quantification or by a specifier. In such cases, the head may not have a mate, and rather, appears to be otherwise null.

E. S-functors may or may not have a unique phonological index. When they do not, head movement is required to allow for the phonological realization of S-marking. The specific form of head movement involves a re-merger and a subsequent assignment of range to the relevant moved head, accompanied by its re-projection effectively as the head of the relevant ExP-segment. As a result, the movement does not give rise to any additional structural complexity.

\textsuperscript{43} In allowing the emergence of projecting functional heads within the Extended Projection from an iterative movement of the (head of the) C-core, this system is a direct derivative of Ackema, Neeleman, and Weerman (1993), where it is assumed explicitly that this is the mechanism that drives the formation and the categorial properties of Extended Projections. The account nonetheless differs from Ackema et al.’s insofar as Extended Projections can exist without head movement, and S-functors are adjoined, rather than moved.

We note, finally, that the first instance of merge, in this system, effectively requires the root to merge with itself, and with the higher copy subsequently re-projecting as an additionally labeled ExP-segment (i.e. N-CL).
Turning to a summary of the interaction between S-functors and head re-merger/re-projection, the following conclusions have been reached:

F. Within a head-pair, phonologically abstract S-functors entail head re-merger/re-projection.

G. Indirect range assignment entails head re-merger/re-projection.

H. Open issue: do phonologically realized S-functors block head re-merger?

The reader is referred in particular to Chapter 6 where many of these issues will be revisited in the context of a better understanding of the workings of the syntax of complex words.

1.6 Organization

Fundamentally, this is a book on English categorial morphology, putting forth the claim that the merger of English categorial (derivational) affixes (mostly suffixes) with their base is part of (narrow) syntax, and more concretely, that it is formally indistinct from whatever merge operations otherwise affect syntactic elements, and that it is part of the same derivational continuum. The properties of inflectional systems are touched upon, but, as we shall see (and see also section 1.5 above) this is primarily in order to clearly delineate the difference between the properties of "derivational" functors, our C-functors, and the properties of the S-functor system, together with the Extended Projections and the S-marking system that emerge from it.

While the theoretical claims made are not taken to be language specific, most exemplifications and case studies do come from English. Two important exceptions to this concern the study of derived nominals, where Hebrew features rather prominently, and Chapter 11, where a study of Semitic morphology serves as a particularly convenient juxtaposition to English not only because it is based on the author’s native language, but also because Hebrew, specifically, is syntactically rather similar to English and even more so to Romance, but has a morphological system that appears to be just about as different from that of English or Romance as two morphological systems can be. Insofar as it can be shown, and I believe it will be, that a system that has been developed almost exclusively on the basis of English derivational morphology can work surprisingly well in an auto-segmental morphological Semitic system such as Hebrew, the model has, hopefully, escaped the danger of being too English-specific to stand an explanatory chance. The decision to narrow the discussion to one (and a half) systems was a deliberate one. Insofar as the model under development makes claims that run contrary to many current accounts, an in-depth study of one system seemed the preferable method to pursue so as to elucidate as much as possible the logical and theoretical consequences of the system. Insofar as some typological verification clearly is crucial, Hebrew was recruited to the task, although the discussion of Hebrew morphology clearly falls short of doing justice to the full system. Any attempt at broadening the empirical base would have rendered the project as a whole even more elephantine than it already is. This said, the reader should bear in mind
that even within the area of English derivational morphology, the discussion is by no means complete. For reasons of space, a substantial study of primary compounds in English and in Hebrew has been left out. More seriously, only a superficial account is offered for English (non-category changing) prefixes, and the account of adjectives, as a category, remains extremely incomplete (and see Chapter 7, section 6 for some discussion of the general issues). Nor was there any attempt to seriously address argument-structure changing morphology, scanty in English to begin with, and which presents, theoretically, problems that are distinct from those of classical “derivation” or classical “inflection”.

Because of the pivotal impact of Chomsky (1970) and the Remarks approach on all subsequent studies of complex words, it is precisely the agenda outlined by that approach that guides the unfolding of the theoretical narratives in the following chapters. Chomsky’s original claims were grounded in a detailed comparison of derived nominals and gerunds, and it is against the regularity of the latter that the irregularity of the former emerged in a sharp relief. It is therefore not surprising that it is derived nominals that have become emblematic to the debate between lexicalist and non-lexicalist approaches, and that it is their adequate and explanatory treatment that is the benchmark against which any theory of word formation, be it lexical or syntactic, must be measured.

Viewed from a different perspective, derived nominals, either because they have been massively studied and in a broad array of languages, or because they altogether serve as excellent testing grounds due to their relative frequency and relatively high productivity, are also considerably better understood than many other derivatives. From that perspective as well, any attempt at a syntactic account of word formation which cannot account syntactically for the properties of derived nominals is, in all likelihood, a non-starter.

Finally, and precisely because a (wholly) syntactic treatment of derived nominals is a sine qua non of any syntactic approach to word formation, the specifics of such a syntactic treatment, if successful, perforce give us important insight into what, in principle, can be syntactically modeled, and what, potentially, are residues that must be otherwise treated. It allows us, in other words, to take as the foundation for our theoretical modeling a case study which consists not only of observations, but of a detailed syntactic analysis.

It is for the reasons above that I have opted to organize this volume in a somewhat unusual way. Following this rather brief introduction, Part I of this book offers an in-detail syntactic analysis of derived nominals in English and in Hebrew with a particular focus on Argument-Structure nominals (AS-nominals, Grimshaw’s 1990 complex event nominals). More specifically, a general introduction to the study of derived nominals and a review of its history is given in Chapter 2. Chapter 3 provides evidence for the presence of a VP constituent within derived nominals, based primarily on the properties of derived nominals in Hebrew, a language where some properties of derived nominals are easier to discern, with some detours to English. Chapters 4 and 5 give a detailed analysis of the “Long”, the “Short”, and the “Short+raising” derivations of AS-nominals (cf. (26)–(28)). Importantly, I argue that AS-nominals must contain a verbal Extended Projection, complete with event-structure related
ExP-segments, and that the de-verbal nominal itself, in all cases, is syntactically derived from a verbal source. The difference between AS-nominals and R-nominals (Grimshaw’s result nominals) in turn revolves not on the presence of a V-head, required in both, but rather, on the presence of event-related ExP-segments in AS-nominals vs. their absence in R-nominals. Equally crucially, I argue that the structure of ING-AS-nominals and ATK-AS-nominals (ATK=-ation and kin) is fundamentally the same, and that differences in their distribution (e.g. as in (28)) emerge from the fact that ING\(_N[v]\), a C-functor, nonetheless has a semantic function as well, barring it in telic contexts, while ATK, likewise a C-functor, is a pure syntactic function:

(26) \textit{Long de-verbal nominals:}
   a. Mary’s forming of the committee
   b. Mary’s formation of the committee

(27) \textit{Short de-verbal nominals:}
   a. the forming of the committee (by Mary)
   b. the formation of the committee (by Mary)

(28) \textit{Short de-verbal nominals plus raising:}
   a. *the committee’s forming (by Mary)
   b. the committee’s formation (by Mary)

The exercise, as such, serves two purposes. First, it quite simply shows that a syntactic analysis for derived nominals, where by derived nominals we mean the internal composition of the word itself (e.g. formation or forming) as well as its syntactic environment (as in the fuller phrases in (26)–(28)) is not only feasible, but is clearly more explanatory, for principled reasons, than any analysis that can be offered within lexicalism. Second, in Part II of this book (Chapters 6–12), when I turn to the details of the specific model of word formation being proposed here, it is the already established internal syntax of derived nominals that will often serve as the base on which extensions can be built, allowing a broader picture of English derivatives. Needless to say, the reader who is happy to assume the veracity as well as the specifics of the syntactic analysis proposed for derived nominals, but is interested in the workings of the model proposed should feel free to commence his or her reading with Chapter 6 of this book.

Armed with conclusions about the syntax of words reached on the basis of Part I, Part II elaborates on the way in which properties of complex words emerge in a syntactic system. Specifically, Chapter 6 investigates architectural matters and offers an in-detail study of what I have referred to as C-functors. It is also in that chapter that the reader will find a fuller discussion of Extended Projections and their segments, and the specific formal distinction between the functors that license such segments (S-functors) and C-functors that themselves project. Matters of syntactic category, and specifically the path from a category-less root to a categorized constituent are pursued in Chapter 7, where I outline a structuralist, contextual model of root categorization and where I investigate the properties of locality in conjunction with
root realization and root phonological selection. It is in that chapter that I argue against zero categorizers in English (i.e. phonologically null equivalents of -ize or -ation), showing that postulating such zero categorizers (either as zero-morphemes or as zero-realized n or v) gives rise to a system which is highly susceptible to non-falsifiability and which, to the extent that it does make predictions, can be shown to be wrong. The properties of the root itself, by assumption a phonological index, are pursued in Chapter 8, where I also evaluate the respective roles of (so-called) morpho-phonology and morpho-syntax and argue rather strongly against any model of word formation which centers on the latter to the exclusion of the former. Chapter 9, crucial to the system, addresses the non-compositionality of complex words by defining a syntactic domain within which such non-compositionality can emerge. As such, Content matching becomes a local domain, and Chapter 10 investigates the interaction of the local domain of Content with the local domain of phonological selection and phonological realization, showing the picture to favor, indeed almost force, a phase-based derivation.

Two case studies complete this book. The first, in Chapter 11, is an application of the model developed in Chapters 6–10 to the Hebrew verbal template system, with a particular focus on issues of locality relative to phonological selection and Content matching. The last chapter, Chapter 12, completes the circle by returning to AS-nominals in the context of a detailed comparison with Synthetic Compounds. Precisely because, superficially, the phonological realization as well as the meaning of, e.g., (the) truck driving and (the) driving of the truck are so similar, and precisely because upon a closer investigation their syntax as well as their Content turn out to have vastly different formal properties, the study of Synthetic Compounds serves as particularly strong evidence for the system, in arguing, directly and rather conclusively, that not only is the syntactic structure of truck driving different from that of (the) driving of the truck, but it is the internal syntax of driving itself that is different in each of these instantiations, a conclusion that is thus profoundly incompatible with any syntax-independent system of word formation.
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Part I

The Form, the Forming, and the Formation of Nominals
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Introduction

2.1 Neo-constructionist Approaches to Grimshaw’s Typology

The syntax to be proposed for derived nominals here and in the next three chapters is based on the assumption that the relationship which holds between a verb and the nominal morphologically derived from it (e.g. \textit{form} $\rightarrow$ \textit{formation}; \textit{form} $\rightarrow$ (the) \textit{forming}) is syntactic in nature, and thus represented in the syntactic structure. Similar assumptions are made about the relationship between adjectives and the nouns derived from them (e.g. \textit{kind} $\rightarrow$ \textit{kindness}; \textit{drinkable} $\rightarrow$ \textit{drinkability}), although the discussion will focus considerably more on the former than on the latter. In Chapter 3, I will establish that such syntactic verbal (or adjectival) constituents indeed do exist in at least some derived nominals, specifically those which are associated with event structure. In subsequent chapters I will elaborate on the specific relationship which holds between verbal/adjectival constituents and event structure, on the one hand, and the nominalization structure which dominates them, on the other. Crucially, and in line with the argumentation in Borer (2005b), I will assume that event structure is not contingent on properties of the verb or adjective as such. Rather, it is the structural event structure, as associated with a specific set of ExP-segments, functional projections, which creates event structure, including the event argument. As we shall see, and in addition to the general advantages of such an approach to event structure, already outlined in Borer (2005b), it will prove extremely useful in accounting for the properties of those nominals derived from verbs and adjectives which are not associated with event structure and for the properties of derived words in general.

The proposal that deverbal nominals contain a VP or some other syntactic V constituent is, of course, not new, and variants date back to the earliest days of generative grammar.\footnote{See Lees (1960). See also Lebeaux (1986), where the reconstruction of a VP in Logical Form is argued for. For a detailed set of arguments for a VP constituent in derived nominals in Hebrew, see Hazout (1991, 1995). For the proposal that in French both result and process nominals are syntactically derived from a verbal source, see Valois (1991). For Parallel Morphology-type accounts for the distinction between non-argument structure nominals (R-nominals, below), assumed to be derived pre-syntactically from V, and argument structure nominals (AS-nominals, below), assumed to have syntax as their input and hence corresponding to a VP, see Borer (1991/1993, 1998b), Fu (1994), Schoorlemmer (1995), Engelhardt and Trugman (1998), and Engelhardt (2000), among others. For the assumption that derived nominals are syntactically derived from verbal constituents across their occurrences see Borer (1999b), Fu, Roeper, and Borer (2001). For accounts which postulate aspectual structure within AS-nominals, but which differ from the present account in postulating distinct functional nodes in various AS-nominal contexts, see van Hout and Roeper (1998), Alexiadou (2001, 2009), and Sichel (2010), among others. The details of some of these proposals will be discussed throughout, as their significance becomes clear.} Many of these proposals are based on the type of evidence to be
put forth in this study, which correlates the properties of AS-nominals with those of syntactically projected VP constituents. Nonetheless, many of these proposals flounder because they fail to observe that what is typically considered a broad optionality within the domain of derived nominals is, in actuality, not a case of optionality as such, but rather, a case of ambiguity. In this respect, it is the work of Grimshaw (1990), although itself executed within a lexicalist framework, which lays the typological foundation for the returning of derived nominals into the syntax, in having observed that in actuality, derived nominals, once separated into two distinct classes—those which are associated with event structure and an event argument, and those which are not—are quite well behaved.2 For this reason, it is worthwhile reviewing briefly her diagnostics, as they set the stage for the ensuing proposal, according to which these two classes of derived nominals, although both syntactic, have very distinct syntax.

Grimshaw (1990) distinguishes between what she calls complex event nominals, and which I will refer to as AS-nominals (argument structure nominals, by assumption including the event argument), and result nominals, which I will refer to as R-nominals (nominals with individual reference).3 Her detailed diagnostics for the two types (slightly modified) are in (1):

(1) Some distinctions between referential nominals and AS-nominals4

<table>
<thead>
<tr>
<th>R-nominals</th>
<th>AS-nominals</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. No obligatory arguments</td>
<td>Obligatory arguments (where relevant)</td>
</tr>
<tr>
<td>b. No necessary event reading</td>
<td>Event reading</td>
</tr>
<tr>
<td>c. No agent-oriented modifiers</td>
<td>Agent-oriented modifiers</td>
</tr>
<tr>
<td>d. Subjects are possessives</td>
<td>Subjects are arguments</td>
</tr>
<tr>
<td>e. <em>by</em> phrases are non-arguments; select <em>sel</em> or <em>me’et</em> in Spanish</td>
<td><em>by</em> phrases are arguments; in Spanish select <em>por</em>, in Hebrew select <em>‘al yedey</em> (where typically licit)</td>
</tr>
</tbody>
</table>

2 And see also Ruwet (1972), for early formulations of similar ideas. For excellent reviews of the history of accounts of derived nominals, see Roeper (2005) and Rozwadowska (2006).
3 And see below for a critique of some of the specifics of Grimshaw’s claims and analysis, justifying, among other changes, the relabeling.
4 Some of Grimshaw’s diagnostics are less robust than others, and may be pre-empted for some contexts. In general, the typology derives its force from the fact that while some counter-examples do occur (and see (i) for some), others (e.g. implicit argument control; in x-time aspectual modifiers; *‘al yedey ‘by’ in Hebrew) are always correct, and for counter-examples, such that they exist, it is always the case that one of the diagnostics may not hold, but that failure is isolated and other diagnostics are valid:

(i) a. (*intentional) queen for a day (*in a day); the (*constant) chef for the three years
    b. a deliberate/*frequent fiction (*for a year) (*by the defendant)

    Importantly, the presence of what appears like a direct object is frequently quite misleading, and is certainly not barred in nominals that do not share any of the other diagnostics:

(ii) a lesson of physics
    a book of poems
    a tale of mischief

Finally, Grimshaw (1990) postulates the diagnostic in (iii), which, in turn, interacts with the occurrence of frequent and constant:
f. No implicit argument control
   Implicit argument control

g. No aspectual modifiers
   Aspectual modifiers such as for three
   hours; in three hours

h. Modifiers like frequent only
   with plural
   Modifiers like frequent may occur without
   plural

These diagnostics are exemplified for AS-nominals in (2) and for R-nominals in (3):

(2)  a. the instructor’s (intentional) examination of the student
     b. the frequent collection of mushrooms (by students)
     c. the monitoring of wild flowers to document their disappearance
     d. the destruction of Rome in a day

(3)  a. the instructor’s examination/exam
     b. John’s collections
     c. These frequent destructions took their toll.

Crucially, and corroborating the typology, an attempt to mix the properties of these
distinct nominal types leads to ungrammaticality, thereby illustrating the fact that
what we are dealing with here is a true grammatical fact, and not a case of vagueness
or massive optionality within nominals:

(4)  a. *Mary’s frequent collection
     b. *the collection to document the disappearance of mushrooms
     c. *the frequent examination/exam (*by John)
     d. *the destruction in a day

I will endorse, in the remainder of this book, Grimshaw’s (1990) classification of
derived nominals into two distinct types, along the lines of the diagnostics above.
Additional diagnostics will be provided in Chapters 3 and 4. I will further adopt
the claim that the crucial difference involves the event structure properties of one
class (AS-nominals) vs. the absence of such properties in the other (R-nominals). The
central subject matter of Chapters 3–5 is outlining a detailed syntax for AS-nominals.
Crucially, however, and departing from the spirit of Grimshaw’s analysis, I will assume
that event structure—and certainly when eventive (i.e. not static)—entails the exist-
ence of a verbal constituent. More specifically, and because the ExP-segments impli-
cated in event interpretation are “verbalizers” in the relevant sense outlined in
Chapter 1, they cannot directly dominate N within their Extended Projection.

(iii)  R-nominals
       may not occur with constant unless plural

AS-nominals
       must be singular
       may occur with constant when singular

In fact, the claims are imprecise, a matter I return to in Chapter 4. The relevant distinction is between
count and mass, rather than singular and plural, and it does not distinguish between AS-nominals
and R-nominals as such. Rather, atelic derived nominals are mass, and may be modified by frequent and
constant without plural marking. Conversely, telic derived nominals must be count, and hence either plural
or singular. The plural occurrence may, of course, occur with frequent or constant, but not so the singular.
Note that R-nominals as well, when mass, may be modified with constant, but not so with frequent, leaving
the occurrence of frequent with a non-plural a valid diagnostic for the presence of an (atelic) AS-nominal.

We note now that the assumption that (eventive) event structure comes with a V Complement Space is by no means the only logical possibility, nor does it follow from any external considerations, or at least not any more so than the claim that, for example, plural or D have an N Complement Space or that T selects V, much as one typically does take the latter two statements for granted. Within the approach to categorization that will be developed here and which was already hinted at in Chapter 1 (and see also Borer 2003, 2005a, b) those statements should be differently phrased to begin with. To be more precise, then, because the ExP-segment we call T has a V Complement Space, the root that merges with T (or with its fellow Extended-Projection members) becomes V-equivalent. The root that merges with D or with any other nominal ExP-segment is in turn N-equivalent and so on. Even more specifically, within such a system it is not the V or the A that select their Extended Projection, nor are V and A ever inherent properties of roots (although they are inherent properties of C-functors). Rather, it is the ExP-segment, by virtue of the specific semantics of S-functors, that defines its CCS so as to have some set of properties that we may think of as equivalent to some categorial properties. By definition, then, the fact that event structure selects, indeed defines a V Complement Space is incompatible with the claim that N may be dominated by event structure.6

And yet, the claim that event structure, however construed, may be associated with nominal constituents has been explicitly and frequently advanced. Fundamentally, it is the claim in Chomsky (1970), and it is, of course, Grimshaw’s own assumption. Within more syntax-oriented approaches, the explicit embedding of nouns within a syntactic event structure, however constructed, has been proposed at least by Picallo (1991) and by Ouhalla (1991). Within neo-constructionist approaches, it has been proposed by Marantz (1997 and subsequent work), Alexiadou (2001), Harley (2009a), and most recently strongly advanced by Embick (2010).7

As an illustration, consider the schematic representations in (5)–(6). (5) is proposed in Marantz (2001), and within a somewhat different set of assumptions about categorization, in Picallo (1991) and Ouhalla (1991). Importantly, in (5) the root selects its complement directly. (6) is in essence the proposal in Alexiadou (2001). Alexiadou, note, shares with Borer (1994, 1998a, 2003, 2005b) the assumption that

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6 A notational reminder: contextually derived categorial equivalencies are marked as $C=V$; $C=N$; $C=A$ $[C=V]_N$ $[C=N]$ etc. In e.g. formation, $C_N[v]$ stands for a C-functor which projects N and has a V Categorial Complement Space (CCS) (and where N and V are properties of functors) and which is realized phonologically as $/$formation/. $\sqrt{xyz}$, by assumption a category-less root, becomes $[C_N[V]\sqrt{xyz}]$, i.e. V-equivalent when it merges with $C_N[v]$. The resulting representation for formation is thus $[C_N[V]\sqrt{xyz}]$. For more discussion of CCS for both C-functors and ExP-segments, see Chapter 6.

Here, and throughout, the notation $\sqrt{XYZ}$ is in reference to roots as phonological indices. The notation $\sqrt{XYZ}$, on the other hand, is in reference to roots in general, and most saliently within the Distributed Morphology approach. The reader is invited to consult the Glossary for a full range of notational conventions and abbreviations used.

7 At least some of these executions are fundamentally incompatible with Grimshaw’s typology, insofar as they allow for a complement to be selected by a root without the emergence of event structure. For some explicit discussion of this point see Harley (2009a). For a more detailed discussion from the present perspective, see Chapter 8, section 3.
so-called direct internal arguments are licensed in the specifier of some aspectual functor, which is notated in (6) as ASP (and see also Egerland 1996 for a very similar structure to (6)). I am setting aside temporarily issues involving head movement as well as of insertion:8

\[(5) \begin{align*}
\text{a. } & \big[ \_D \big. \text{ the army} & \big[ \_N \big. \text{ \{n} + \sqrt{\text{DESTROY}} \} & \text{ the radio station } \big] \\
\text{b. } & \big[ \_V \big. \text{ the army} & \big[ \_V \big. \text{ \{v} + \sqrt{\text{DESTROY}} \} & \text{ the radio station } \big]
\end{align*}\]

\[(6) \begin{align*}
\text{a. } & \big[ \_D \big. \text{ the army} & \big[ \_N \big. \text{ \{n} + \sqrt{\text{DESTROY}} \} & \text{ the radio station } \big] \\
\text{b. } & \big[ \_V \big. \text{ the army} & \big[ \_V \big. \text{ \{v} + \sqrt{\text{DESTROY}} \} & \text{ the radio station } \big]
\end{align*}\]

In the structures in (5)–(6), two independent claims come together to give rise to a picture which is rather distinct from the one to be proposed here. First, insofar as the root comes to be associated with a category, such categorization is accomplished through its merger with a dedicated categorial functor such as n, v, or a. Importantly, note that the root itself as a terminal remains category-less. Second, the categorization of the root is independent of the existence of any syntactic-functional event structure that may dominate it. Thus even if functional event structure is present, as in (6), its merger above the root has no effect on its category, nor does any conflict emerge if the root has been categorized, independently, as n. Likewise, the presence of an argument directly selected by the root, as in (5), has no categorial effect on the root.

But now it turns out that the structures in (5)–(6), as well as all accounts which postulate a noun associated with event structure, be it functional or not, inherit from Grimshaw’s account a number of rather serious problems. To see that this is so, let us consider in greater detail the specifics of Grimshaw’s proposal. Crucially, the distinction between event structure nominals and non-event structure nominals, in her system, is contingent on the presence of an event argument for the former vs. a referential argument for the latter. Plausibly, the presence of an event argument is correlated with event properties, including modification and the existence of argument structure, giving rise to what we have labeled here AS-nominals. Equally plausibly, in the absence of an event argument, event modification and argument structure are not possible.

However, and as Grimshaw herself observes, the picture is not quite so simple. Specifically, there exist nouns which clearly denote an event, but which nevertheless do not allow event modification or argument structure in the sense of the diagnostics in (1). More specifically, and while such nouns may allow logical arguments, in some

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8 The text discussion here focuses on the different views of categorization which distinguish (5)–(6) from the perspective to be put forward in this work. The representations in (5)–(6) differ from the one presented here in a number of additional ways. First, (5) (but not necessarily (6)) incorporates the assumption that roots assign internal arguments (and see also Marantz 1997; Harley 2009a, b), a claim directly challenged in Borer (2005b), and see also Chapter 8. Second, the structures presuppose that the subject interpretation can be licensed as a free interpretation possessor, and not through grammatical event structure (cf. Grimshaw 1990; Marantz 1997; Alexiadou 2001; Harley 2009a, i.a.), a claim that I will directly challenge in Chapters 4 and 5.
sense, such arguments as well as any event modification cannot be internal to the DP that they head. Some relevant examples are in (7)–(9), illustrating the fact that while some types of event modification are possible for such events, most properties associated with AS-nominals are absent, and those that do occur require the addition of a verb:

(7) a. The class started at noon and lasted two hours.
   b. The lesson took place at dawn.
   c. The fest started at 8 pm.
   d. The trip lasted several days.

(8) a. I gave a class to the students at 9 am.
   b. I took a trip to the mountains in order to collect mushrooms.
   c. We frequently have a fest to celebrate the holidays.

(9) a. *Mary’s class of/in physics to the students for two hours/at 9 am
   b. *the lesson of/in math by Nick in order to improve our computing skills
   c. *the frequent fest in order to celebrate the holidays
   d. *the trip to the mountains in order to collect mushrooms

Given this state of affairs, it is clear that the event denotation of a noun, in and of itself, cannot be the source of the diagnostics in (1), and rather some other means are necessary to distinguish between AS-nominals, as in, e.g., (2) and the event-denoting nominals in (7). To this end, Grimshaw introduces a distinction between complex event nominals (=AS-nominals) and simple event nominals, i.e. those in (7). The distinction is based, primarily, on the assignment of the external argument. Thus it is the assignment of the role \( Ev \), that of the event argument, that results in the emergence of complex event properties, while the assignment of \( R \), a referential index, does not. The nouns in (7), by assumption, assign \( R \) rather than \( Ev \), with the absence of complex event properties being the result. However, because in Grimshaw’s model \( Ev \) and \( R \) assignment is independent of the derivational history of the nouns in question, and because all (de-verbal) derived nominals are in essence ambiguous between an AS-nominal and an \( R \)-nominal instantiation, the fact that some nouns denoting events cannot take arguments and cannot assign an \( Ev \) role, while others do, becomes a matter of an arbitrary stipulation.

And yet the classification is anything but arbitrary. Note yet again, that “simple” events are fully compatible, syntactically, with “complex” events, insofar as arguments and event modification are possible providing a light verb is present, as (8) already shows. Simple events as in (9) are thus specifically barred from being related to arguments and event modification internal to the nominal. Quite straightforwardly, the simplest generalization appears to be that a verb or some other appropriate predicate is missing in (9), and thus event properties cannot emerge. This already suggests that there is a sense in which AS-nominals contain an argument licensing constituent which “simple” event nominals do not. This conclusion, in turn,
correlates directly with the fact that AS-nominals are always derived from a verbal or adjectival source, while nouns which do not have a verbal or an adjectival source can never be AS-nominals. The correlation holds not only of English, but also of the

9 Citing an observation to that effect by Zucchi (p.c.), Grimshaw notes this fact, but does not pursue its consequences. English aggression appears to be an exception, in that it allows, at least for some speakers, an AS-nominal reading, as in (i), in the absence of the verb aggress (in the standard language):

(i) the frequent aggression towards sovereign nations in order to gain control over their natural resources

As is well established, however, although the verb aggress may be missing as such, all its verbal derivatives, including aggression, aggressive, and aggressor are present. In view of this, postulating an entry for a verb aggress which happens to be phonologically unattested in isolation is inevitable. We note that this is certainly not the case with, e.g., lesson, where no verbal derivatives are available whatsoever.

The generalization nonetheless is directly challenged by Newmeyer (2009), who enlists the “complex event nominals” in (ii) in support of his challenge, indeed, in support of his across-the-board disputing of Grimshaw’s typology, advocating, in its stead, a return to a view of derived nominals as a massively optional and lexically listed set with properties potentially overlapping, across the board, with those of underived nominals, or nominals without any obvious base form:

(ii) a. Mary’s metamorphosis of the house (made it unrecognizable)
   b. the IRS’s scrutiny of dubious looking tax forms
   c. my lab assistant’s culture of new forms of bacteria
   d. the anathema by the church of those taking part in satanic rituals
   e. Iraq’s frequent changeover of its currency (has left its people confused)
   f. the constant mischief by the boy
   g. Quisling’s ongoing treason (was the shame of Norway)
   h. the frequent recourse to long discredited methods
   i. my impulse to be daring
   j. Yahoo’s homicide of AltaVista and AllTheWeb

Unfortunately, and with the possible exception of (iib, i), there is little evidence to support the status of most of these nominals as AS-nominals, or complex event nominals in Grimshaw’s sense. The claim that they are AS-nominals is based almost exclusively on the presence of a complement. Complements, if missing, certainly indicate an R-nominal. Their presence, however, is entirely inconclusive, as is directly evident from the grammaticality of the lesson of physics and similar cases (and see fn. 4). As already noted in the same footnote (and see also Chapter 4, section 4), the presence of plural does not exclude an AS-nominal reading, nor does the presence of constant with a non-plural force it. In view of this, the status of (iif) as an AS-nominal is in need of further corroboration. Similarly, although a by-phrase occurs in (iid) and (iif), an English by-phrase, in and of itself, cannot be a conclusive test for an AS-nominal, as Grimshaw explicitly notes, given its authorship reading.

Valid, infallible tests for AS-nominals, in turn, are provided by a purpose clause, controlled by an overt or covert argument, as well as by aspectual modification, such as in two hours or for two hours. As it turns out, and with the exception of (iib), none of these cases allows a purpose clause, and the only one that allows aspectual modification, for some speakers, is metamorphosis. But then, the status of metamorphosis as an underived noun is itself in question, as a great many native speakers of English accept metamorphose as a verb. It is worth noting that a purpose clause for nouns such as culture, mischief, treason, or homicide is certainly plausible. Furthermore, a purpose clause could be attested once the nouns under consideration are provided with an additional light verb. Its obligatory absence in (iib, d, e, f), when compared, e.g., with committing treason/homicide/mischief or taking culture is in clear need of explanation and as such casts serious doubt on classifying the relevant cases as AS-nominals:

(iii) a. the (official) anathema by the church (*for many centuries) of those taking part in satanic rituals (*in order to protect itself from their challenge)
   b. the ongoing treason (*by Quisling) (*in order to support Nazi Germany)
   c. the metamorphosis of the house (*by Mary) (*in order to erase the traces of her ex-lover)
   d. the culture of new forms of bacteria (*by my assistant) (*in seven days/*for seven days) (*in order to find an antidote) (cont.)
Romance languages (cf. Ruwet 1972), of German (cf. Ehrich and Rapp 1999; Ehrich 2002), of Greek (cf. Alexiadou 2001), of Polish (cf. Rozwadowska 1988, 1997), and of Hebrew (Hazout 1991, 1995; Borer 1991/1993) and Arabic (Fassi Fehri 1987; Hazout 1991). Viewed from that perspective, one is certainly tempted to view argument structure as well as event interpretation as dependent on the presence of some verbal or adjectival constituent, and as impossible in the content of “pure” nominals. But if this is indeed the case, then it emerges that nominal structures as such could never be the source of event interpretation or argument structure. At the very best, they are vehicles for passing on the roles and properties of some verbal or adjectival structure within them (I return to this matter in Chapter 8, sections 1 and 3, where the ramifications of these correlations for the representation of roots and for word-internal structure are pursued in great detail. See also Chapter 6, section 2.4 and Chapter 7, section 3.3 for relevant consequences).

The problems for identifying what, exactly, the structural source of the event interpretation is within nominal constituents are further compounded by the fact that many nominals derived from verbs may have the characteristics of a “simple” event, as (10) illustrates:

(10) a. The frequent examinations/exams took place in the principal’s office.
    b. The destruction occurred at dawn. (see Zucchi 1993)

How, then, should we characterize words such as destruction or examination, such that each consists of (at least) two entries, both denoting an event, one which assigns an Ev role and behaves like a complex event, while the other assigns an R role and behaves like a simple event?

Finally, we note that while AS-nominals do need to have an event interpretation in the episodic sense, they need not be eventive and may be stative. Such is certainly the case for nominals derived from adjectives, clearly in evidence whenever the source adjective in question can occur with complements, and those are, in turn, directly “replicated” by the nominal derived from it, as (10) illustrates:

    e. the constant mischief by the boy (*for two hours/*in two hours) (*in order to get attention)
    f. the homicide of AltaVista and AllTheWeb (*by Yahoo) (*in order to increase the value of its shares)
    g. the scrutiny (?by the IRS) of dubious looking tax forms (*in order to uncover tax evaders) (*for two months)

This state of affairs leaves recourse and impulse (the latter with an infinitival complement otherwise difficult to account for) as the only potential counter-examples. For some brief comments on the existence of counter-examples within the domain of “words” see the appendix to Chapter 6.

10 At least in some contexts (cf. (i)), subjects in de-adjectival nominals are obligatory, although they may be missing in their de-verbal correlates:

(i) a. *the awareness of the problem (by the authorities)
    b. *the consciousness of my presence (by my cats)
    c. *the closeness to the road (by the children)

(i), in turn, contrasts with the possibly absent subjects in (ii):

(ii) a. awareness of the problem (*by the authorities)
    b. consciousness of my presence (*by my cats)
    c. closeness to the road (*by the children)

I return to this matter in some detail in Chapter 5, section 3.
(11) a. the court’s awareness of the problem (for many years)
b. Pat’s consciousness of my presence (for several minutes)
c. Jill’s fondness of classical music (for many years)
d. Marcia’s closeness to her parents (for many years)
e. the party’s satisfaction with the counting results (for a few hours)

(12) a. The court was aware of the problem (for many years).
b. Pat was conscious of my presence (for several minutes).
c. Jill was fond of classical music (for many years).
d. Marcia was close to her parents (for many years).
e. The party was satisfied with the counting results (for a few hours).

First, we note that of the diagnostics in (1) only those in (13) remain relevant:

(13) a. obligatory arguments (where relevant)
b. subjects are arguments
c. allows some aspectual modification (notably, when compatible with stage level statives)

Yet, although some of the diagnostics in (1) are not met by de-adjectival nominals, they clearly are not R-nominals. The situation, we note, is not exactly surprising. Insofar as the nouns in (11) are statives, we do not expect agent control or agent modification, nor is the absence of a by-phrase particularly shocking. And yet, although this seems a rather straightforward situation, it constitutes a formal problem for Grimshaw’s account, where derived nominals specifically do not inherit any event properties but are its direct assignors. The problem is further exacerbated by Grimshaw’s assumption that the assignment of the Ev and R roles is linked to properties of specific nominalizing affixes, and in particular, to the claim that ING (always) assigns Ev, that, Ø-nominalizers only assign R, and that ATION (and kin, presumably) may assign either. Clearly, now, if the derived nominals in (11) or the suffixes -ness and -ity assign Ev to their external argument, the absence of event modification, event control, etc., becomes mysterious. If, on the other hand, they do not assign Ev, but rather, they assign R, the presence of an argument structure identical to that of the source adjectives alongside the non-R-nominal properties of (11) cannot be captured.

Plausibly, now, the properties of de-adjectival nominals could be accounted for if we assume that -ity and -ness license a stative-event argument (e.g. sEv) while ATION and ING assign a (potentially) eventive event role (e.g. eEv).11 In Grimshaw’s

11 As I will argue in Chapter 4, AS-ING nominals are always eventive. AS-nominals however can be stative, as in, e.g., adherence to doctrine or attendance of classes. Marchand (1969) in fact suggests explicitly that -ance/ence is always associated with a stative reading. Roeper (2005) notes a similar effect, and notes, further, that -ment tends to be associated with results. While the tendencies are certainly there, they nonetheless fall short of a strong generalization, given the existence, side by side, of transmission and transmittance, as well as deferment and deferral, or the existence of AS-nominals such as perception or (with compositional reading) both government and governance with the same possible reading as AS-nominals. For some relevant comments on this matter as well as a review of cases that involve multiple realizations for the nominal suffix, see Chapter 6, section 2.
system, however, the properties of the relevant suffixes here would have to be stated entirely independently of the derivational history of the relevant nouns. The fact that only $sEv$ affixes attach to adjectives would become a pure coincidence. Likewise, the fact that there are no de-adjectival nominalizers, call them $-ity$ and $-ness'$, which assign $eEv$ would become a coincidence as well. We note in this context that there is nowhere in the grammar, nor does it seem desirable to introduce, a statement of agreement in some inherent event properties between suffixes and stems. But in the absence of such a statement, and if one maintains that suffixes may assign event arguments, one must ask what prevents a nominalizing affix from introducing event properties that are incompatible with those of the stem, precisely because by assumption the event properties of that stem need not be structurally realized.

The natural way to avoid such complications would be to assume that affixes in themselves are, at best, vehicles for the transmission of event properties otherwise licensed. But if that is the case, then we must conclude that nouns, as such, never have event structure, and that the source for event interpretation must always be sought below the level of nominalization.

Suppose, then, that we assume that the arguments as well as the type of event associated with derived nominals are inherited in some crucial sense from lower constituents, themselves verbal or adjectival in some sense. What would be the ramifications of such an approach? Note first that it immediately entails the rejection of the picture in (6a). Although at first sight the picture in (6a) appears to be radically different from the lexicalist one put forward by Grimshaw, it is, in effect, a notational variant of it. While argument structure is not assigned directly by the verb or the noun, as Grimshaw would have it, the execution in (6a) amounts to superimposing an event structure on top of a (derived) nominal, doing syntactically what otherwise is accomplished by Grimshaw through the assignment of $Ev$. The structural approach is capable of distinguishing between AS-nominals and R-nominals insofar as the latter presumably do not have the syntactic event structure in (6a), but rather involve the embedding of the $n+$root directly under some nominal functional structure. Such an execution, however, is yet again equivalent to assuming that some nominals assign $R$, rather than $Ev$. Either way, the relation between the derived nominal and its stem is obscured, and identifying what nominal may or may not have an event interpretation and what type of event it may represent remains an open question. Most specifically, the representation in (6a) is no more capable of explaining the absence of argument structure in nominals which are not derived from verbs or adjectives than Grimshaw’s account.

We note now that within lexicalist approaches to argument structure which subscribe to the view that verbs are listed together with their argument structure properties, Grimshaw’s decision to reject the embedded verb as the source of event interpretation is a reasonable one indeed. Specifically, de-verbal R-nominals, which are likewise morphologically derived from verbs, do not have arguments or event

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12 Inheritance accounts of some sort are explicitly put forth in Williams (1987) and Roeper (1987b).
interpretation. If one were to assume that event structure is inherited from a listed verb, then the event properties of the verb and its arguments would have to be suppressed, somehow, in the context of an \( R \) argument, returning the account, effectively, to the “optional arguments for nouns” view, precisely the approach which Grimshaw seeks to go beyond. Consider from this perspective the structure in (5a). There is no verb—or adjective—in that structure. However, the root, category-less though it might be, is listed as an assigner of an internal argument. The derived nominal, in turn, contains this \([\text{root+argument}]\) constituent within it. Insofar as the root here carries an argument, the presence of an internal argument in AS-nominals is accounted for. Insofar as R-nominals need not have that internal argument realized, although they are derived from the very same root, an account for R-nominals within that approach would have to either suppress that argument or, alternatively, deny outright the validity of the R-nominal/AS-nominal distinction. The latter is, indeed, the direction implied by Marantz (1997 and subsequent work) and advocated directly in Harley (2009a). It is the opinion of the present author that in so doing, these authors are abandoning an extremely powerful and fundamentally correct distinction, that can, and does, shed important light on properties of words and word formation.13

From the perspective advanced here, now, the argumental properties of derived nominals cannot be directly inherited from the verbs or the adjectives embedded within them for the simple reason that in XS it is assumed, rather fundamentally, that grammatical properties are within the prerogative of functors or configurations, and that V-equivalent roots (such as \([C=\pi \sqrt{\text{form}}]\) or \([C=\pi \sqrt{\text{inherit}}]\)), or A-equivalent roots (such as \([C=\pi \sqrt{\text{close}}]\) or \([C=\pi \sqrt{\text{fond}}]\)) are, to begin with, no more than phonological indices rendered category-equivalent by their functional context. Insofar as an AS-nominal such as \(\text{formation} \) is derived, in some sense, from \([C=\pi \sqrt{\text{form}}]\), its AS-nominal properties cannot possibly come from the root, as by

13 In an attempt at a remedy, Embick (2004, 2010) proposes that root stock should be divided into eventive and stative, with only the former being capable of having an argument and thus allowing the structure in (5a). The remedy would presumably exclude e.g. \(\sqrt{\text{FLOOR}}\) as an argument assignor and hence would predict that it would not emerge as an AS-nominal (or, for that matter, as a verb).

Unfortunately, as a remedy, this appears altogether to cut the pie the wrong way. \(\sqrt{\text{FLOOR}}\) and similar such roots may, in fact, occur as verbs (cf. (i) as well as the paradigm of verbal uses of \(\sqrt{\text{siren}}\) already discussed in Chapter 1, section 4). Nonetheless, they still cannot occur as AS-nominals (cf. ii). In turn, \(\sqrt{\text{KILL}}\), presumably a predicative root, patterns with \(\sqrt{\text{FLOOR}}\) in disallowing the AS-nominal in (iii). Finally, the remedy leaves open the issue of why the arguments of R-nominals may be missing but not those of AS-nominals, when the root under consideration is the very same one, and hence, by assumption, predicative in the relevant sense:

(i) a. I floored my living room; I floored my computer (e.g. \(\text{put it on the floor}\)).

b. the flooring of my living room; the flooring of my computer

(ii) *the floor of the living room (\(\text{with the intended reading}\)); *the floor of my computer

(iii) *the kill of the dog

For some additional discussion of the meaning of roots, see Chapter 8, section 3.
assumption, \([C=V^{\pi}\sqrt{\text{FORM}}]\) has none to pass on. Nor, for that matter, do derived verbs such as, e.g., *realize* have any argument structure to pass on to their nominalizer, as all event-related information, including arguments, must come from some ExP-segments.

But as it turns out, it is this latter claim that provides us with a direct resolution to an important conundrum, which the proposals in (5a)–(6a) cannot resolve: how to distinguish between AS-nominals and (derived) R-nominals, given the fact that the very same verb—or root—is embedded within them. Specifically, because verbs, or roots, in and of themselves, have no grammatical properties and do not select arguments, embedding them within a nominal directly would result in no properties short of those associated with the nominal structure itself, and these do not include event structure. These would be R-nominals, essentially with the structure in (14), where event structure is neither expected nor present:

\[
\begin{align*}
(14) & \quad \text{a.} \quad C_N[v] \\
 & \quad [C=V^{\pi}\sqrt{\text{FORM}}] \\
& \quad C_N[v]/\pi\text{-ation} \\
\end{align*}
\]

As for AS-nominals, these would involve the incorporation of the root/stem into the suffix through a succession of head re-mergers and re-projections, and thus very broadly as in (15) (and see Chapter 1, section 5 for the relevant claims regarding head re-merger and re-projection, as well as Chapters 4 and 5 for extensive elaboration). Note that in (15) \([C=V^{\pi}\sqrt{\text{FORM}}]\) is (most directly) rendered V-equivalent by the ExP-segment (ExS) it merges with:

\[
\begin{align*}
(15) & \quad \text{a.} \quad C_N[v] \\
 & \quad [C=V^{\pi}\sqrt{\text{FORM}}] \\
& \quad C_N[v]/\pi\text{-ation} / \text{ExS1} \\
\end{align*}
\]

Crucially, then, although AS-nominals and R-nominals are morpho-phonologically identical, the syntactic structure associated with them is distinct. Note further that the identity of the morpho-phonological forms here emerges directly from two factors. First, the derivation is made possible by the fact that all the ExP-segments between the root and the \(C_N[v]\) or \(C_N[A]\) are associated with abstract S-functors, thus allowing the head to re-merge and re-project. Secondly, the derivation is crucially dependent on the CCS of the relevant C-functor with which the root/verb eventually merges being identical to the CCS of the Extended Projection directly dominating the root/verb. Thus if the (categorized) root were prevented from re-merging as the head of any intermediate ExP-segment because of an overt S-functor, it could not
merge with \( C_{N[V]} \). Equally importantly, if the C-functor under consideration were to be \( C_{N[A]} \), but the CCS of the Extended Projection directly dominating the root were to be \( V \), the derivation would collapse as a result of the merger of a \( V \)-equivalent constituent in an \( A \)-equivalent context. I return to some of these matters in the context of a phase-based execution in Chapter 10.

The discussion above constitutes a very strong claim concerning the impossibility of embedding nouns under event structure, and the obligatory presence of a VP (or AP) constituent, as well as full functional event structure, inside derived nominals of the \( \text{AS} \)-type.\(^{14}\) Within the XS model, this conclusion is effectively forced. We also provided some preliminary evidence for it, by observing that AS-nominals are always derived from concrete verbs or adjectives. Nonetheless, the claim that there is such a VP (AP) constituent inside derived nominals is in need of further justification, precisely because it is not typically assumed, a matter that will be taken up in the next chapter.

The schematic structures in (14)–(15) are in need of elaboration as well. The main issues which arise in the context of (14) involve categorizing and the relationship between the root, a phonological index, and the spellout possibilities of its nominalizers. Those will be taken up in Chapters 6 and 7. Further concerns touch on the possible emergence of non-compositional Content for complex derivatives. These will be discussed at some length in Chapter 9. The issues which arise relative to (15), however, are at the core of the subject matter of the remainder of this introduction as well as the next three chapters, in which I will attempt to construct a restricted, explanatory syntax for derived nominals along the broad lines in (15), so as to allow them to resume their legitimate syntactic existence. It is my contention that unless such an attempt is successful, any endeavor to return derivatives into the syntax is doomed to remain hopelessly and embarrassingly incomplete.

### 2.2 Structural Considerations

Before proceeding to a detailed analysis of AS-nominals, it is important to delineate, syntactically, the boundaries which separate AS-nominals structurally from other nominals, however complex they may be, on the one hand, and from propositional event complexes, on the other hand. When we consider specifically the differences or similarities between AS-nominals and other nominals (whether derived or unde-

\(^{14}\) The system is explicit about the impossibility of associating (complex) event structure with nouns, but makes no claims about arguments of nouns which do not constitute events, as in relational nouns or in cases such as a story about Mary.

In Chinese, Japanese, and Korean, as is well known, verbal nouns (so labeled) may be directly dominated by event structure; for an analysis of verbal nouns as verbal (specifically participle-like) elements rather than nominals in such cases, see Fu (1994), Takahashi (2000), and Park (2008), respectively.
AS-nominals in different languages is frequently greater than whatever structural affinity may exist within any one grammar between AS-nominals, on the one hand, and other nominals, on the other.

When we consider the properties of AS-nominals in comparison with properties of event structure in propositional contexts, yet again a systematic picture emerges, showing AS-nominals to differ along predictable lines, cross-linguistically, from properties of propositions. Insofar as AS-nominals have shared structural properties that clearly are not language-specific, they certainly merit an analysis which attempts to get to the bottom of their universal characteristics, rather than an analysis which is otherwise contingent on language specific nominal or clausal structures. 15

2.2.1 AS-nominals vs. other nominals

Turning first to a comparison of AS-nominals and other nominals, consider the structure in (16), a somewhat more elaborate bracketed version of (15), assuming, as seems rather innocent, that the 'external' and the 'internal' arguments merge as the specifier of ExP-segment 1 and ExP-segment 2 respectively (and see section 4 below for a fuller articulation). Clearly, (16) cannot be the whole story, as the word order which emerges is ungrammatical in English (shaded italics for copies, ExS for ExP-segments):

\[(16) \! [N \ \text{destroy} + C_{\text{N}[v]} \ [\text{ExS}_2 \ \text{the army} \ \text{destroy} \ [\text{ExS}_1 \ \text{the radio station} \ \text{destroy} \ [c=v \ \text{destroy} \ ]]]] \]

(17) a. *(the) destruction (of) the army (of) the radio station
b. *(the) collection (of) Lyn (of) Shaggy Manes

A grammatical derivation, in English, requires of-insertion preceding the object and a raising of the subject to a prenominal position, as in (18a). Alternatively, the subject may be expressed as a by-phrase, as in (18b), or eliminated altogether, as in (18c). If either (18b) or (18c) is opted for, it is possible for the object to surface in the pre-nominal position, as in (18d):

\[(18) \! \text{a. Lyn's collection of Shaggy Manes} \]
\[\text{b. the collection of Shaggy Manes by Lyn} \]
\[\text{c. the collection of Shaggy Manes} \]
\[\text{d. the Shaggy Manes' collection (by Lyn)} \]

Some aspects of the ungrammaticality of the word order in (17) need to be elaborated on before we turn to a detailed discussion of the structure of AS-nominals. It is well known that English does not allow two post-nominal of-phrases, a fact that

15 Here and in the remainder of Part I, I will use the term "clause" to mean, broadly, contexts in which the existence of a VP as well as passive is uncontroversial (i.e. propositions, gerunds, small clauses of certain types, etc.). This is not intended to suggest that the VP extended structure within AS-nominals is not clausal in the technical sense.
is quite independent of the structure of derived nominals. (19a–c), in which no derived nominals are present, are likewise ungrammatical:

(19) a. *the picture of Rembrandt of Aristotle
   b. *the picture of Aristotle of Rembrandt
   c. *the picture of Aristotle of the museum

It is further well known that the ungrammaticality of (19) is not universal. In Romance and in Hebrew, for example, the equivalents of (19a–c) are grammatical, as illustrated by (20)–(21) (Romance examples from Zubizarreta 1979; see Cinque 1980, Zubizarreta 1979, 1987, and Giorgi and Longobardi 1991 for discussion of the relevant facts in Romance; see Shlonsky 1988 for discussion of the Hebrew facts):

(20) a. ha.tmuna šel ha.xamaniyot šel ha.muzeon
    the.picture of the.sunflowers of the.museum
   b. ha.tmuna šel ha.muzeon šel van Gox
    the.picture of the.museum of van Gogh
   c. ha.tmuna šel van Gox šel ha.muzeon
    the.picture of van Gogh of the.museum

(21) a. Le portrait d’Aristote de Rembrandt de Pierre
    [target] [agent] [possessor]
    ‘Pierre’s portrait of Aristotle by Rembrandt’
   b. le portrait de Rembrandt d’Aristote
    ‘the Rembrandt portrait of Aristotle’
   c. le portrait de Rembrandt du musée
    ‘the museum’s portrait painted by Rembrandt’

Similar facts hold in Polish, as discussed in Rozwadowska (1997):

(22) a. szkoła tańca Wojnaralskiego
    school dance.gen Wojnaralski.gen
    ‘Wojnaralski’s dance school’
   b. galeria sztuki Małgorzaty Kowalskiej
    gallery art.gen Małgorzata Kowalska.gen
    ‘Małgorzata Kowalska’s gallery of art’

It thus might appear at first sight that the ungrammaticality of the word order in (17) (with of inserted) is a language-particular fact, of little universal relevance to the structure of AS-nominals. This, however, is only apparent. A closer investigation reveals that the of-equivalent of (17) remains ungrammatical in Hebrew in either order (subj>obj as well as obj>subj), as (23) illustrates. That the order obj>subj is similarly impossible with two occurrences of de/di has been noted by Zubizarreta (1987) for Romance (cf. 24) and for Polish in Rozwadowska (1997) (cf. 26). That the converse order, subj>obj, is similarly illicit in both Romance and Polish is illustrated by (25) (for French) and (27) (for Polish, with thanks to B. Tomaszewicz, p.c.) (and
see Borer 1999a for a detailed discussion of the Hebrew facts). Thus it appears that even in English the ungrammaticality of (17) does not necessarily reduce directly to the ungrammaticality of (19) and that at least in Hebrew, Romance, and Polish, and possibly in English as well, some explanation for the unavailability of such word orders is called for:

(23) a. *ha.šel Lyn šel ha.pitriyot
   the.collection of Lyn of the.mushrooms

   b. *ha.hapcaca šel ha.caba šel taxanat ha.radio
   the.army of station the.radio

(24) a. la description répétée du paysage {par Pierre/*de Pierre}
   the description repeated of.the landscape {by Pierre/of Pierre}

   b. la traduction des données {par Pierre/*de Pierre} dans 3 mois
   the.translation of the.data {by Pierre/of Pierre} in 3 months

   (Zubizarreta, 1987)

(25) a. *la description répétée de Pierre du paysage
   the description repeated of Pierre of.the landscape

   b. *la traduction de Pierre des données dans 3 mois
   the.translation of Pierre of.the data in 3 months

(26) a. napisanie listu {Kowalskiego/ przez Kowalskiego}
    writing letter.gen { Kowalski.gen/ by Kowalski.acc}

   b. zniszczenie miasta {wroga / przez wroga}
    destruction city.gen { enemy.gen/ by enemy.acc }

   c. sprzedaż samochodu {Jana /przez Jana}
    selling car.gen { John.gen/ by John.acc } (Rozwadowska 1997)

(27) a. *napisanie Kowalskiego listu
    writing Kowalski.gen letter.gen

   b. *zniszczenie wroga miasta
    destruction enemy.gen city.gen

   c. *sprzedaż Jana samochodu
    selling John.gen car.gen

The ungrammaticality (of the relevant variants) in (17), (19), (23), and (25)–(27) could not be due to some condition requiring the subject of a derived nominal to appear pre-nominally (on a par, say, with the subject of clauses). In Hebrew, we note, that is an impossible position for any nominal including AS-nominals. In French as well as in Polish, all but (some) possessor pronouns are blocked in that position. Such a proposal is thus of very limited generality. Nor is a restriction against post-nominal subjects, even in English, going to do much work for us. Rather, in English as well as in Hebrew and French, post-nominal subjects are possible either when no object is present, or, for most speakers, when the complement is not a direct object in need of of-insertion, as in the contexts in (28a–d), and if an indirect complement is
present, it follows the subject rather than precedes it, including in Hebrew, French, and Polish, where that order is illicit for direct complements:

(28)  
a. the (frequent) arrival of the trains  
b. the (constant) laughter of children  
c. (?) the (constant) complaining of children to their parents  
d. (?) the (constant) thinking of CEOs about their profits

(29)  
a. ha.rica šel ha.yeladim  
   the.running of the.children  
b. ha.nepila šel ha.'even  
   the.falling of the.stone  
c. ha.hištabcut šel Rina be-šuk ha.?aboda (b-a.šana ha.'axrona)  
   'Rina’s integration into the labor market during the past year’

(30)  
a. l’obéissance {des troupes à leur chef ?? à leur chef des troupes}  
   the.obeissance [of-the troops to their chief/to their chief of the troops]  
b. la fidélité {de Jean à ses amis / ?? à ses amis de Jean}  
   the.loyalty [of John to his friends/to his friends of John]  
c. Le galoppement du cheval pour onze heures (l’a rendu malade)  
   The.galloping of-the horse for eleven hours (made him sick)  

(31)  
a. opowiadanie {Janka, /*przez Janka} o swojej podróży  
   talking [John.gen /by John.acc] about self trip  
   'John’s talking about his trip’  
b. fascynacja {dziewczat/*przez dziewczęta} aerobikiem  
   fascination [girls.gen/by the girls.acc] aerobics.instr  
   ‘the girls’ fascination with aerobics’  
c. pływanie {Janka, /*przez Janka} (przez godziny)  
   swimming [John.gen/by John.acc] (for an hour)  
d. przyjazd/odjazd {Janka, /*przez Janka} w/za 5 minut  
   arrival/departure [John.gen/by John.acc] in 5 minutes  

   (Rozwadowska 1997)

The generalizations that emerge are thus as follows:

(32)  
a. R-nominals:  
i. English allows two realizations of genitive. One, pre-nominal, is realized as ‘s. The other, post-nominal, realized as of. Two of realizations are not allowed within the same nominal.  
ii. Hebrew, Romance, and Polish allow up to three post-nominal genitive realizations (šel, de/di, gen). Romance and Polish, but not Hebrew, allow a pre-nominal genitive realization for (some) pronouns.
b. **AS-nominals:**
   i. English allows two realizations of genitive. One, pre-nominal, is realized as ‘s. The other, post-nominal, realized as of. Two of realizations are not allowed within the same nominal (thus far, identical to R-nominals).
   ii. Hebrew, Romance, and Polish allow at most one post-nominal genitive realization. Romance and Polish, but not Hebrew, allow a pre-nominal genitive realization for pronouns.

If, indeed, English only allows one instance of of post-nominally, it emerges that if of is associated with the subject, a direct object cannot surface. On the other hand, if it is associated with the object, the subject may still occur pre-nominally, in the “Saxon genitive” configuration, where it receives genitive. The same is true of French and Polish but only when the subject is a pronoun (with further restrictions in Polish, see Rozwadowska 1997 for discussion). For non-pronominal subjects in French and Polish, as well as for any argument configuration in Hebrew, the situation which emerges resembles, surprisingly, that of English, but only within the AS-nominal domain. Here, it appears, only one equivalent of of-insertion is possible. If associated with the subject, the object may not be thus marked. If associated with a direct object, the subject is either missing or it surfaces as a by-phrase. This, in spite of the fact that the languages do typically allow for two post-nominal of-insertion contexts in non-AS-nominal contexts. This surprising asymmetry between AS-nominals and other nominals, and its independence of otherwise attested language-specific structural factors thus suggests that AS-nominals cannot be analyzed as representing some general optionality within nominal structures, and rather must be treated as syntactically distinct from non-eventive nominals, rather contrary to, e.g., the Remarks approach or syntacticalizations of it, as in Ouhalla (1991), Picallo (1991), Marantz (1997), or more recently, Newmeyer (2009). In section 6 of Chapter 3, I return to these contrasts, in the context of a detailed study of the structure of Hebrew AS-nominals.

Establishing structural differences between AS-nominals and other nominals nonetheless falls short of offering a full syntactic account for the properties of AS-nominals. A summary of at least some of the properties which are in need of explanation and which distinguish AS-nominals from other nominals is in (33):

(33) a. The fundamental claim to be supported in the next few chapters is that all arguments within the AS-nominal, including the subject, are licensed within the event functional complex. Given this assumption, how, exactly, does the understood subject come to be in the pre-nominal position in (18a)?
   b. Even more mysteriously, how can Shaggy Manes, a logical object and certainly occupying a position within the event functional complex, occur in the pre-nominal position in (18d)?
   c. What is the source of the by-phrase in (18b)? Is it the same by-phrase one finds in verbal contexts?
   d. Where did the “external” argument in (18c) vanish to? And doesn’t this suggest that at least the subject in AS-nominals is optional?
   e. Why, indeed, are two post-nominal of-arguments ungrammatical in (23)–(24)?
2.2.2 AS-nominals vs. verbal event complexes

Grimshaw (1990) already outlined many of the ways in which AS-nominals behave like an event complex occurring in the more agreed-upon verbal contexts, including aspectual modification, the presence of an argumental by-phrase, agentive modification, etc., all of which, she suggests, are properties of event structure, rather than properties of verbal structures as such. On the other hand, and focusing on deverbal nominals, I will argue that functional event structure is always associated with a verbal constituent, quite simply because any C-core immediately dominated by such an event complex must be, definitionally, V-equivalent. Nonetheless, there are clear ways in which the properties of AS-nominals distinguish them from those of verbal constituents in more canonical contexts, and which are in need of explanation. Many of those are well known and have been discussed in Chomsky (1970) and subsequent literature. Thus consider the following:

(34) a. The unavailability of adverbs in AS-nominals and the presence of adjectives instead, even when modifying events (cf. the contrast between (35) and (36)). Note that the post-object adverbial placement of successfully in (36b) is not fully ungrammatical and certainly considerably better than alternative placements or any occurrence of presumably, a point I return to in Chapter 3, section 7.16
b. The absence of objective case assignment in AS-nominals, specifically, in the specifier of ExS1 in (15), where, presumably, it would surface in “standard” verbal configurations.
c. The lack of any tense and agreement markings on the verb in AS-nominals.

(35) a. Barbara’s presumed destruction of the dishwasher (in three weeks)
b. the successful installation of the cabinet by Gillan

(36) a. Barbara’s (*presumably) destruction (*presumably) of the dishwasher (*presumably) (in three weeks)
b. the (*successfully) installation (*successfully) of the cabinet (?successfully) by Gillan

To the issues outlined in (34), we need to add the contrasts in (37)–(42), pointed out in Chomsky (1970), and distinguishing gerunds (or other clearly verbal eventive contexts) and derived nominals. Some comments are added:

(37) Transitive grow is barred in AS-nominals
   a. the farmer’s growing the tomatoes/the tomatoes’ growing
   b. the growth of tomatoes (intransitive reading only)
   c. *the farmer’s growth of tomatoes
      -> But as Chomsky (1970) notes, ING derived nominals are licit:
   d. the farmer’s successful growing of the tomatoes

16 Note that presumed in (35a) is in reference to destruction. Presumably in (36a), in turn, is ruled out in all possible positions and with all possible construals. The example is meant to illustrate the absolute exclusion of the adverb presumably in AS-nominals, regardless of its interpretation, and does not represent a claim about meaning or scope correspondences between adjectives and adverbs. For some comments on the latter, see Chapter 3, section 9.
(38) “Raising-to-Subject” (from small clauses and infinitives) is barred in AS-nominals (adjectives added to exclude gerundive construal):
   a. Kim seems nice
   b. *Kim’s (presumed) seeming nice
   c. *Kim’s (presumed) seeming to be nice

(39) “Tough” constructions are barred in AS-nominals
   a. Robin is easy to please/Robin’s being easy to please
   b. *Robin’s easiness to please

(40) “ECM (Raising-to-Object)” is barred in AS-nominals
   a. Pat’s believing Robin to be a genius
   b. Bill’s considering Jill smart
   c. *Pat’s belief of Robin to be a genius
   d. *Bill’s consideration of Jill smart

(41) “Particle shift” is barred in AS-nominals
   a. Pat’s writing up the letter
   b. Pat’s writing the letter up
   c. Pat’s writing up of the letter
   d. *Pat’s writing of the letter up

(42) “Dative shift” is barred in AS-nominals
   a. (Carly’s) generous giving of gifts to the children
   b. *(Carly’s) generous giving (of) the children (of) gifts

It might be worthwhile noting that while the source of the effects in (37)–(42) is certainly in need of explanation, most of the accounts that Chomsky himself offered for their impossibility in (1970) are no longer even stateable, let alone explained within present theoretical frameworks, leaving at least some of these contrasts without a ready account, regardless of whether they are syntactic or lexical. In turn, offering full analyses for, e.g., verb particle constructions or for Tough movement so that they can be shown to derive the distinctions in (39) and (41) is clearly outside the scope of this work. Nonetheless, some account of the asymmetries is required. I will provide an answer to at least some of these puzzles in the following chapters. The properties of grow and growth are discussed in some detail in Chapter 7, section 3.4 (and see also Chapter 12, section 3.2.1), and the impossibility of Particle Shift is analyzed in Chapter 4, section 5 (see also Borer 2005b), and section 1 of that same chapter provides an account for the non-availability of Dative Shift. The impossibility of Raising-to-Subject, Raising-to-Object, and Tough constructions in AS-nominals is discussed in Chapter 3, section 3.

Returning to the questions in (34), I suggest that the absence of agreement and tense marking in AS-nominals is directly due to the absence of T, in itself hardly a problem. That an event functional complex may be available without tense or subject–verb agreement is amply illustrated, with Romance causative constructions (as argued by Burzio 1986), Chinese V–V compounds (as argued by Li 1990), serial verb constructions (cf. Déchaine 1993a, i.a.), and English gerunds themselves being a
few of many illustrations. In all these cases tense, nominative case, and subject–verb agreement are not attested, while the presence of argument structure and a VP Extended Projection (or some correlate thereof) are not in doubt. Nor is the absence of nominative case, correlating as it does with the presence of T, particularly surprising. More importantly, in Borer (2005b), I argue explicitly that the existential closure of the event argument is not linked to the presence of tense (or temporal specification of any sort), but rather to spatial specification, making the existence of an event reading without a T unproblematic.17

Somewhat harder to explain is the absence of two other typical characteristics of the event functional complex missing in AS-nominals: adverbs and objective case assignment. As I will show, their absence in English may very well turn out not to be a universal fact. Thus my starting point, in Chapter 3, will be the detailed study of VP properties within Modern Hebrew (henceforth Hebrew) AS-nominals, where both adverbs and objective case are attested. And yet in most other respects Hebrew AS-nominals are minimally distinct from English AS-nominals. At the very least, therefore, the absence of adverbs and objective case in AS-nominals cannot be regarded as a universal, or as reflecting, in general, on the presence of a VP constituent within them. The task, then, is to account for the fact that in some languages they are not attested. To this end after a fuller review of Hebrew AS-nominals as well as some aspects of English AS-nominals in Chapter 3, I will return in Chapters 4 and 5 to the English paradigm, in order to account for the similarities and the differences, and suggest an explanation for the variation.

2.3 Event Structure: the Building Blocks

A discussion of the structure of AS-nominals, by assumption grammatical events, must be mindful of the particular architecture of event structure, and specifically, be couched within an explicit articulation of the schemes in (15). The system I will assume here is that developed in considerable detail in Borer (2005b), and the reader is referred to that work for the relevant argumentation. What is included below is a summary of the system, insofar as it will inform the discussion of the syntax of AS-nominals in an important way.

Wishing to capture the major properties of event structure through the presence of S-functors, I postulate in Borer (2005b) the existence of two event-related functional nodes (=ExP-segments) within the non-stative domain: E (Event Phrase) and ASP_Q (Aspect/Quantity Phrase). The architecture suggested does allow, although does not justify in any way, the existence of additional aspectual structure, in particular that which might be implicated in the licensing of some goal arguments (possibly PATH), or potentially a more articulated higher functional structure which may distinguish between externally caused events and others or between agents and causers. The

17 That a T is present within (ING) AS-nominals is nonetheless argued for in van Hout and Roeper (1998) (see also Roeper 2005). I return to some aspects of their analysis throughout the next few chapters.
specific structural proposals are motivated by a particular view of the syntax and semantics of events. The major tenets of that approach are summarized in (43):

(43) A. The fundamental building blocks of event structure involve what is at times called telicity, and which I refer to as “quantity”. In assuming that, fundamentally, telicity involves events with quantifiable divisions, I follow Krifka (1992, 1998), although I deviate from his approach both in assuming a different ontology for quantity events and a different ontology and grammatical role for the interaction between quantity and direct objects, as delineated directly below.

B. Crucially, I subscribe to the view that an event may have quantifiable divisions even when none of these divisions overlap or contain the end of the event or its result (and see (44) as an illustration). At least one of the consequences of this approach is that quantity events cannot meaningfully decompose into a process plus result structure, contrary to many current approaches. Another consequence is the ability to characterize as bona fide cases of quantity the cases in (44), which contain quantifiable division but no discernible telos, and which typically are problematic for result-based approaches to telicity.

C. Nor does the event need to be measured out by parts of the object, contrary to many current claims. Thus quantity events, under certain circumstances, may be altogether intransitive, or have a non-quantity object (cf. (52)–(53) below).

(44) a. I ate more than three apples. (*quantifiable division established at 3 apples*)
b. I filled the room with smoke. (*quantifiable division established at “full of smoke” even if smoke filling continues past this point*)
c. The boat floated under the bridge. (*quantifiable division established at the point of emerging from under the bridge, even if floating goes on past that point*)

The syntactic corollaries of (43) are spelled out in (45):

(45) A. Quantity (telicity) is established syntactically through the projection and properties of the head of ASP$_Q$, an open value (≪c≫). The open-value head of ASP$_Q$ can be assigned range, QUANTITY (and the category ASP$_Q$) either through the existence of a quantity DP in its specifier (optionally marked as accusative) or through an adverbial or prepositional locative. It may also directly enter a head-pair relationship with S-functors, where available, such as aspectual prefixes (e.g. in Slavic) which assigns both range and category to it.

B. Non-quantity (atelicity) is the absence of syntactico-semantic quantity, and involves the failure of ASP$_Q$ to be instantiated. Non-quantity cases which appear to be transitive (e.g. (46)) involve the merger of what I refer to as a FP-Shell (FP$^{SHL}$), a semantically vacuous ExP-segment which is thus devoid of an open value and whose specifier is associated with partitive Case and which may thus license the merger of a DP.
(46)  a. Kim pulled the cart.
    b. Robin drove the car.

Assumptions concerning the syntax–semantics of $E$ are as in (47):

(47)  A. The head of $E$ is interpreted as the event argument which must, in turn, be
    existentially closed. Syntactically, such existential closure is achieved
    through the valuation, or assignment of range, to $\ll e \gg_E$.

B. The existential closure of the event argument is accomplished through a
    spatial/locative operator, rather than by temporal operators. Referential
    DPs (strong DPs) perforce are assumed to have spatial illocutionary force,
    and can therefore value $\ll e \gg_E$ when they merge as its specifier. When
    there is no specifier, $\ll e \gg_E$ may still be valued by an overt locative in the
    proper syntactic configuration, either directly (as part of a head-pair) or
    indirectly.

The relevant contrasts which illustrate the properties in (47) in Hebrew and in
English are in (48)–(49). By assumption, in (48a) $\ll e \gg_E$ is assigned range by the
strong DP in its specifier, assignment that is impossible when the DP itself is in need
of existential closure, as in (48b), or when the DP is not the specifier of $\ll e \gg_E$
altogether, as in (48c–d). A locative clitic on the verb, by assumption in $\ll e \gg_D$,
can also achieve such licensing, as in (49a–b). No such licensing results from the
presence of a temporal clitic, however, as the ungrammaticality of (49c–d) illustrates
(and see Borer 2005b, 2010 for extensive discussion). Finally, as (50) illustrates, a
locative phrase can merge as the specifier of $\ll e \gg_D$ by assumption assigning range to
it. No such licensing emerges from the presence of a temporal phrase in the same
position:

(48)  a. ha.yeled rac b-a.rexob
    the-boy ran in-the.street

b. ??yeled rac b-a.rexob
    boy ran in-the.street

c. *rac ha.yeled b-a.rexob
    ran the.boy in-the.street

d. *rac yeled b-a.rexob
    ran boy in-the.street

(49)  a. rac šam yeled b-a.rexob
    ran there boy in-the.street

b. rac po yeled b-a.rexob
    ran there boy in-the.street

c. *rac az yeled b-a.rexob
    ran then boy in-the.street

d. *rac šam ha.yeled b-a.rexob
    ran there the.boy in-the.street
(50)  a. Opposite the landing-place stood half a dozen donkeys with saddles on their backs.
    b. On the third floor worked two young women called Maryanne Thomson and Ava Brent...
    c. *From five to six o’clock stood half a dozen donkeys with saddles on their backs.
    d. *Last year worked two young women called Maryanne Thomson and Ava Brent...

((a) and (b) from Levin and Rappaport-Hovav 1995)

Finally, in this model the interpretation of arguments within events is an entailment from event structure, and not its determinant. Neither E nor ASP₀ need to have arguments in their specifiers to be syntactically licit or to receive an interpretation. Existential closure of an event is certainly possible without a DP subject, as in (51), and quantity interpretation is possible without a direct object, as illustrated in (52)–(53), and where in (53), Russian nu is a perfectivity-inducing affix effectively with the meaning ‘once’:\(^{18}\)

(51)  a. There is a band of noisy kids in the street.
    b. It rained this morning in Paris.

(52)  a. The army took over (in two days).
    b. The catcher wanted the pitcher to pitch out (and see if they could catch the runner stealing).
    c. Frank took up with Lucy (in two weeks).
    d. Mary took to mathematics (in two minutes) like ducks take to water.

(53)  a. Ja mroagna (*casami).
    I blinked (*for hours)
    b. Ja kašjanula (*casami).
    I coughed (*for hours)
    c. On kriknu za minutu (*casami).
    he shouted in minute (*for hours) (Russian; Schoorlemmer 1995)

In turn, DPs which merge in a particular position are perforce interpreted in a particular way, as per the following description:

(54)  A. Originator: a broad role, which within events roughly corresponds to “internal causers” (in the sense of Levin and Rappaport-Hovav 1995), but with the understanding that “external causers” are always “internal causers” as well, insofar as they are the internal causers of their own causing action. Within events, a referential DP that merges with T or with E and which is not already assigned a role is interpreted as an Originator.\(^{19}\)

\(^{18}\) The cases in (53) are interpreted as achievements. As a result, they allow no duration and exclude both in two minutes and for two minutes. For the argument that achievements, in general, are quantity predicates, see Borer (2005b). For arguments that achievements are atelic, see Smith (1991).

\(^{19}\) Importantly, at least some roles, and including Originator, need not be inherently event related. Although they may be entailed in some structural contexts, they may also exist outside grammatical events. See Chapter 12, section 4.2, where the matter is discussed in some detail.
B. **Subject-of-Quantity (S-o-Q):** a role that is associated with an object which undergoes a quantifiable change. It is assigned to a DP if it merges with ASP\textsubscript{Q}.

C. **Default Participant:** an open role which is interpreted in the context of roles and event structure otherwise explicitly marked. It is, e.g., the role associated with a DP which merges with F_{\text{FSHL}}.\textsuperscript{20}

Schematic syntactic representations of event types are given in (55)–(60), together with their neo-Davidsonian semantic representations. Dashed arrows indicate indirect range assignment. Solid line arrows are range assignments in the context of head-pair configurations. Irrelevant details (e.g. head re-merger where not relevant or detailed structure for $T$) are omitted:

(55) **Unaccusatives (quantity):**

a. The flower wilted in a day

b. 

\[
\text{Spec} \: \text{DP}^3 \text{NOM} \quad \llangle e^3 \rangle_e \quad T
\]

\[
\text{Spec} \: \text{DP}^3 \text{NOM} \quad T \quad \text{ASP}_Q
\]

\[
\text{Spec} \: \text{DP}^0 \quad \llangle e \rangle_Q \quad V
\]

\[
[C=v^\pi \sqrt{\text{WILT}]}
\]

\text{Quantity Predicate}

c. $\exists e \: [\text{quantity (e) \& Subject-of-Quantity (the flower, e) \& wilt (e)}]$

(56) **Unergatives (non-quantity):**

a. The flower wilted for several hours (and then I watered it and it recovered)

b. 

\[
\text{Spec} \: \text{DP}^3 \text{NOM} \quad \llangle e^3 \rangle_e \quad T
\]

\[
\text{Spec} \: \text{DP}^3 \text{nom} \quad T \quad V
\]

\[
[C=v^\pi \sqrt{\text{WILT}]}
\]

c. $\exists e \: [\text{Originator (the flower, e) \& wilt (e)}]$

\textsuperscript{20} Following Speas (1994) I assume that ExP-segments have some role. As by assumption $F_{\text{FSHL}}$ is semantically vacuous, if it does not assign partitive, it is not licensed, thereby effectively forcing $F_{\text{FSHL}}$ to merge with a DP.
(57) **Transitive, Telic (quantity):**
   a. Anna read the book in two hours
   b. $\exists e \quad \text{quantity} (e) \& \text{Originator} (Anna, e) \& \text{Subject-of-Quantity} (\text{the book}, e) \& \text{read} (e)$

(58) **Transitive, Atelic (non-quantity):**
   a. Anna read the Bible in church for two hours
   b. $\exists e \quad \text{Originator} (Anna, e) \& \text{default Participant} (\text{the book}, e) \& \text{read} (e)$

(59) **ASP$_Q$, (quantity), direct valuation:**
   a. The army took over
   b. $\exists e \quad \text{quantity} (e) \& \text{Originator} (\text{the army}, e) \& \text{took over} (e)$
2.4 AS-nominals, Preliminary Structures

I suggested that T is not present in AS-nominals, a point I return to in Chapter 3. In turn, and assuming E to be a prerequisite for the emergence of an event, it must be present in AS-nominals. As a consequence, we expect, prima facie, all event types enumerated in section 3 above to occur embedded under N. The results are the structures in (61)–(64) (and setting aside both range assignment and head re-mergers):

(61) **Unaccusatives (quantity):**
the arrival of the train
\[ \text{[D [N C_N[V] [E DP₁ \llike e^3 \ggle E [\text{ASP}_Q DP₁ \llike e^0 \ggle_Q \text{[C=V}^\sqrt{xyz}]\text{]}]]] S-o-Q} \]

(62) **Unergatives (non-quantity):**
the moving/movement of the train
\[ \text{[D [N C_N[V] [E DP₁ \llike e^3 \ggle E \text{[C=V}^\sqrt{xyz}]\text{]}]} \text{Originator}} \]

(63) **Transitive, Telic (quantity):**
Anna’s construction of the model in two hours
\[ \text{[D [N C_N[V] [E DP₁ \llike e^3 \ggle E [\text{ASP}_Q DP₂ \llike e^0 \ggle_Q \text{[C=V}^\sqrt{xyz}]\text{]}]} \text{Originator} S-o-Q} \]

(64) **Transitive, Atelic (non-quantity):**
the driving of the car for two hours
\[ \text{[D [N C_N[V] [E DP₁ \llike e^3 \ggle E [\text{\text{[C=V}^\sqrt{xyz}]\text{]}]} \text{Originator} Participant} \]

---

See Borer (2005b) for Originator assignment in Spec,T. Note that the verb in (60) re-merges as the head of E and is directly S-marked by the locative. See Chapter 1, section 5.3 as well as Chapter 6, section 3 for discussion of S-marking.
By way of anticipating, I will also propose that of, Hebrew šel, Polish genitive case-marking and Romance de/di are the phonological realization of case licensed in the specifier of some nominal ExP-segment. For (61)–(62) as well as for (28) the picture that emerges is thus as in (65) and is independent, note, of event type, as the movement, in all cases, is from Spec,E. It is worth noting that the derivation requires at least two functional nodes below the ExP-segment D, and some N movement, although in English clearly not to D:

\[
(65) \quad [D_{\text{ExS}_2} C_{N[V]}]_{\text{ExS}_1} \quad \text{arrival} \quad \text{movement} \quad \text{of} \quad \text{laughter} \quad \text{at} \ldots
\]

When we consider transitive cases such as (63)–(64), now, clearly more needs to be said, and I will argue that in these cases, of is a spellout of direct object licensing. The emerging representation is thus as in (66), and I return to its motivation in Chapter 4, section 1:

\[
(66) \quad [D \quad \text{DP}_1 \quad 's \quad [D_{\text{ExS}_2} C_{N[V]}]_{\text{ExS}_1} \quad \text{DP}_1 \quad C_{N[V]}] \quad \text{N} \quad C_{N[V]}] \quad \text{E} \quad \text{DP}_1 \quad \ll \text{e}^3 \gg \text{E} \quad \text{ASPQ/FSHL \ DP}_2 \quad \text{of} \quad \text{om} \quad \text{the.house}^{22}
\]

In the next three chapters I embark upon the refinements of these structures, the argumentation for their details, and the examination of their consequences.

### 2.5 The Organization of Part I

Chapter 3 is devoted to a detailed argumentation for the existence of a V-type constituent inside AS-nominals, based on evidence in Hebrew and in English. Based on the structural conclusions reached in Chapter 3, I turn in Chapter 4 to a discussion of Long AS-nominals, where by “Long” AS-nominals I refer, descriptively, to AS-nominals as in (67)–(68), where the logical subject is overt, and where it merges without the help of a by-phrase or its typological equivalent, and where such a subject appears, for all intents and purposes, to merge higher than the object:

\[
(67) \quad a. \quad \text{The scientist’s formation of complex molecules} \\
    b. \quad \text{The scientist’s forming of complex molecules}
\]

\[
(68) \quad a. \quad \text{hapcacat ha.matos 'et ha.bayit} \\
    \quad \text{bombing the.plane om the.house}^{22}
\]

In Chapter 4 considerable space is further devoted to the discussion of the properties of English de-verbal nominalizing suffixes. One important focus concerns the difference between the English nominalizer ING_{N[V]} (which spells out as /\pi ing/) and

\[^{22}\text{om for the Hebrew Object Marker 'et, occurring preceding definite direct objects (including proper names and pronouns).}\]
the group of nominalizing suffixes I previously referred to as ATK (ation and kin) i.e. C-functors of the type $C_{N[v]}$ that may spell out as /ation, al, ment, anc(y), enc(y)/. More concretely, I will argue that ING and ATK cannot be distinguished along any of the lines in (69):

\[(69) \quad \text{It is not the case that:} \]
\[\begin{align*}
\text{a.} & \quad \text{ING nominals are always AS-nominals whereas ATK nominals are ambiguous between AS-nominals and R-nominals (Grimshaw 1990).} \\
\text{b.} & \quad \text{ING, but not ATK, entails the projection of a VoiceP, or some other specifically event related node (e.g. } v)\text{, possibly related to that which projects in gerunds (van Hout and Roeper 1998; Marantz 2000; Alexiadou 2009; Sichel 2010; i.a.).} \\
\text{c.} & \quad \text{ING$_{N[v]}$, but not ATK, is related to the morpheme which in English gerunds likewise is realized /ing/ but which, note, cannot be an instance of N projecting functor (Alexiadou 2009; Sichel 2010; i.a.).} \\
\text{d.} & \quad \text{While ING attaches to a verb, ATK attach to a root (Marantz 1999, 2000; Embick and Marantz 2008; Harley 2009a; Embick 2010).} \\
\text{e.} & \quad \text{AS-nominals with ING have (in principle) more structure than AS-nominals with ATK (Roeper and van Hout 1998; Alexiadou 2009; Sichel 2010; i.a.)} \\
\end{align*}\]

By way of attempting to account for differences that do exist between ING$_{N[v]}$ and ATK, I will argue that while both are instances of $C_{N[v]}$, the C-functor ING, but not the C-functor ATK, names not only the syntactic function $C_{N[v]}$, but also a semantic function which impacts its event structure instantiations. ATK, in contrast, instantiates a pure syntactic functor devoid of any semantic function.

Turning to zero-nominalizers, I will argue that /Ø/ is not a possible spellout for $C_{N[v]}$ in English, and that appearances to the contrary (and contra Kiparsky 1982a, 1997), nouns such as (the) walk, (the) form, (the) dance, (the) jump, etc. are not derived from (to) walk, (to) form, (to) dance, (to) jump. Rather, both nominal and verbal instantiations are cases of roots categorized by their merger environment.\(^{23}\)

In Chapter 5 I turn to Short AS-nominals, i.e. nominals in which the logical subject is either missing altogether, or is expressed through a by-phrase and which, I believe, have different structural characteristics from their Long brethren and represent a passive internal to the event structure domain within the AS-nominal. English, we note, has two variants of Short AS-nominals as contingent on the position of the sole direct argument, of which only one is available for ING$_{N[v]}$, as (70)–(71) illustrate. Hebrew (as well as Romance and Polish) only have the single variant correlating with (70), as in (72). The sole variant, in turn, occurs both as a construct nominal, as in (72a), and as a free nominal, as in (72b). From the perspective of most (but not all) of the ensuing discussion, the properties of construct and free nominals are identical. Special note will be made of different properties, where relevant.

\(^{23}\) In fact, and as I shall argue in some detail in Chapter 7, English is altogether devoid of zero realizations for C-funcors, raising the valid question whether C-funcors with a zero realization are universally attested.
(70) a. the formation of complex molecules (by the scientist)
   b. the forming of complex molecules (by the scientist)

(71) a. the molecules’ formation (by the scientist)
   b. *the molecules’ forming (by the scientist)

(72) a. hapcaca \( \text{ha.bayit} \) (\( ?\text{al yedey ha.matos} \))
    \( \text{bombing the.house} \) (by the.plane)
   b. \( \text{ha.hapcaca } \text{\( ?\text{al yedey ha.matos} \)} \)
    \( \text{the.bombing of the.house} \) (by the.plane)

The conclusions from the analysis of both Long and Short AS-nominals would be as in (73):

(73) A. A full event structure is always present in AS-nominals, be they derived with ATK or with ING.
   B. As a corollary of (A), and appearances notwithstanding, the subject in AS-nominals is never optional.
   C. Nor could it be PRO (or pro) in cases such as (70)–(72).
   D. As a corollary of (A–B), the subject of AS-nominals must be present within the event functional domain, and cannot be considered a free-interpretation possessor.
   E. pro (or PRO) is not, in principle, excluded as the subject of AS-nominals. Such AS-nominals, however, pattern with Long (i.e. active) AS-nominals and not with Short (i.e. passive) AS-nominals, and as such display properties that cannot be reconciled with the properties of nominals such as those in (70)–(72).

And finally, as I will show, intransitive AS-nominals, both unaccusative and unergative, as in (28)–(29) above, are structurally instances of Long active AS-nominals, and not of Short passive AS-nominals.

Assuming the success of the attempt to construct a constrained syntax for derived nominals, I move in Part II of this book to an investigation of a model for the formation of words in the syntax, with illustrations of its properties, referring frequently to lessons learned and conclusions reached from the analysis of derived nominals.
3

Embedding Syntactic Events within Nominals

3.1 Hebrew AS-nominals: Structures

The purpose of this chapter is to offer preliminary general structures for (Long) AS-nominals, as in (1), and to provide empirical evidence for the presence of VP constituents and AP constituents (by assumption with at least some parts of their Extended Projections) within AS-nominals. The discussion in sections 3.1–3.6 is based primarily on Hebrew (with some excursions into French). Some evidence from English is presented in sections 3.7–3.9 below.

(1) a. the scientist’s formation of complex molecules
    b. the scientist’s forming of complex molecules

(2) a. hapcacat ha.matos ‘et ha.bayit
    bombing the.plane QM the.house (QM=Object Marker)

In the past two decades, and originating with Ritter (1988), a flurry of studies on the structure of nominals in Semitic languages has resulted in bringing to light a number of interesting properties concerning the structure of nominals in general and AS-nominals in particular. As has been argued explicitly by Fassi Fehri (1987) for Arabic and by Hazout (1991, 1995) for Hebrew and Arabic, these properties directly support the postulation of a syntactic VP in (de-verbal) AS-nominals in both languages. The discussion in the subsequent sections summarizes evidence already brought forth in these studies and further enhances and supplements it with new arguments and evidence.

Before I turn to the detailed consideration of the relevant data, however, a brief description of the structure of nominals in Hebrew is in order. We note that although exemplification is from Hebrew, both structures and configurations by and large carry over to Arabic (cf. Fassi Fehri 1989 and Hazout 1991). As is well known, both languages may express a relationship between two nominal constituents by placing a head noun in construction with its possessor (henceforth “Construct nominals”). This possibility is entirely independent of the derived or non-derived status of the head noun, as the Hebrew examples in (3) illustrate:
Alongside the forms in (3), Hebrew (but not so productively Standard Arabic) allows the forms in (4), in which the head noun is in a “Free state” (which is to say, not in construction with another nominal as is the case for Construct nominals), and where an of-like preposition, šel, is inserted preceding the possessor:¹

(4) a. ha.ca'īp šel ha.yalda
   the.scarf of the.girl
   ‘the girl’s scarf’

b. ha.‘akila šel ha.pitriyot
   the.eating of the.mushrooms
   ‘the eating of the mushrooms’

Construct nominals with the configuration in (3) generalize not only to possession relations, but to a wide range of other relations, in which a head noun, a head adjective, a quantifier, a verbal participle, and possibly an adposition as well could be in construct with a following nominal projection (ranging from N⁰ to DP). The non-head constituent (the Constructed noun) may be a possessor, an argument, part of a part/whole relation, part of a relational noun, a modifier, or, as in the case of numerals and quantifiers, a restriction. In derived nominals, the focus of our attention here, Construct as well as Free form nominals are available. The Long AS-nominals are in (5)–(6). Short AS-nominals are in (7) and (8). Note that the object marker ’et occurs in the Long form but not in the Short form, a matter I return to in some detail below:

(5) a. hokaxat ha.matematiqa’it ’et ha.ţe?ana
   proof the.mathematician om the theorem

b. šippuc Ran ’et ha.bayit
   renovation Ran om the.house

(6) a. ha.hokaxa šel ha.matematiqa’it ’et ha.ţe?ana
   the.proof of the.mathematician om the theorem

b. ha.šippuc šel Ran ’et ha.bayit
   the.renovation of Ran om the.house

(7) a. hokaxat ha.ţe?ana
   proof the.theorem

¹ The head in Construct nominals, the left-hand member, is phonologically dependent on the non-head, thereby showing certain morpho-phonological bounding effects which are attested here as the phonological distinction between ca'īp (free) and ca'īp (bound) ‘scarf’, ‘akila (free) and ‘akilat (bound) ‘eating’.
b. šiqqum ha.ʔir
    rehabilitation the.city

(8) a. ha.hokaxa šel ha.ṭeʔana
    the.proof of the.theorem
b. ha.šiqqum šel ha.ʔir
    the.rehabilitation of the.city

In Hebrew and Arabic, just like in English, Romance, Slavic languages, Greek, and numerous other languages, morphologically productive de-verbal nominals are systematically ambiguous between an AS-nominal reading and an R-nominal reading. In Hebrew, such systematic ambiguity is in evidence both in Free nominals and in Construct nominals. As in the case of English already reviewed in some detail in Chapter 2, the syntactic distribution of these two types is distinct: an AS-nominal reading must be accompanied by (at least) the “internal” argument of the event, but the R-nominal reading is not thus constrained; AS-nominals may be accompanied by (the Hebrew equivalent of) a by-phrase, implicit argument control, agentive modification and aspeptual modification, but R-nominals may not, etc. Thus in the AS-nominals in (9)–(10), the ‘internal’ argument, whether direct or indirect, is obligatory for an event reading to emerge, agent-oriented modifiers are possible, as are aspeptual modifiers. The logical subject occurs immediately following the head in (9) (a Long AS-nominal), or alternatively, it may occur as part of an argumental by-phrase. Finally, it may be altogether absent but its presence can be nonetheless detected through implicit argument control, as illustrated in (10) (a Short AS-nominal).¹²³

(9) a. ha.hokaxa šel ha.matematiqavit *(‘et ha.ṭeʔana) be-haclaxa
    the.proof of the.mathematician om the.theorem in-success
    ‘the mathematician’s successful proof of the theorem’

² The Hebrew equivalent of by in a by-phrase, ẓal-yedey, is restricted to instrumental and agentive subjects in both its verbal and AS-nominal contexts (cf. Alexiadou and Doron 2012). I return to a fuller discussion of its properties in section 3.1.3 below.

³ Time delimiting adverbs usually used to test telicity effects, the equivalents of English ‘in x time’, can come in Hebrew either with the preposition be- ‘in’ or the preposition tok- ‘inside’. The former, but not the latter, excludes an anticipatory reading, such as that associated with (i), and hence will be systematically used from this point onwards, although less frequent in that use and often not quite as idiomatic. (ii), note, is ungrammatical under any reading as the anticipatory reading is excluded, and as an activity, cannot be modified by a telicity-requiring time adverbial. Note that the ungrammaticality of (ii) argues against giving a unified account to the two occurrences of in x time, and hence against the explanation for time-delimiting adverbs offered in Higginbotham (2009):

(i) Ran yaruc tok šaʔa
    Ran run.FUT inside hour
    ‘Ran will (start) running in an hour.’

(ii) *Ran yaruc be-šaʔa
    Ran run.FUT in-hour
    ‘Ran will (start) running in an hour.’
    ‘Ran will run (some unspecified distance) in an hour.’
b. haₕippul šel haₕiłtonot *(b-a₂ba³aya) be-rašlanut
the.treatment of the.authorities in.the.problem in-neglect
‘the authorities’ negligent treatment of the problem’

| haₕokaxa šel haₕamatematiqa‘it *(‘et haₕe³ana) be-xoḍšayim |
| the.proof of the.mathematician om the.theorem in-two-months |
| ‘the mathematician’s proof of the theorem in two months’ |

| haₕippul šel haₕıltonot *(b-a₂ba³aya) be-xoḍšayim |
| the.treatment of the.authorities in-the.problem in-two months |
| ‘the authorities’ treatment of the problem in two months’ |

(10) a. haₕokaxa *(šel haₕe³ana) (ʔal yedey haₕamatematiqa‘it) |
| the.proof *(of the.theorem) (by the.mathematician) |
| (be-hacdaxa) (be-xoḍšayim) (kedey liₕzikot be-pras) |
| (in-success) (in-two months) (in order to-win in-prize) |
| ‘the (successful) proof *(of the theorem) (by the mathematician) (in two months) (in order to win the prize)’ |

b. haₕippul *(b-a₂ba³aya) (ʔal yedey haₕıltonot) |
| the.treatment *(in-the.problem) (by the.authorities) |
| kedey leₕhabi leₕ-pitaron mahir |
| in order to-bring to-solution quick |
| ‘the treatment *(of the problem) (by the authorities) in order to bring a quick solution’ |

In (11)–(12), on the other hand, the internal argument is missing, forcing an R-nominal reading, which in turn excludes agent-oriented modifiers, an argumental subject, a by-phrase, implicit argument control, and aspectual modifiers. A “subject” if present, is interpreted as a possessor:⁴

(11) a. haₕokaxa *(šel haₕamatematiqa‘it) |
| the.proof *(of the.mathematician) |
| ‘the mathematician’s proof’ (possessor reading only) |

b. haₕippul *(šel haₕ ropes) |
| the.treatment *(of the.doctor) |
| ‘the doctor’s treatment’ (possessor reading only) |

(12) a. *haₕokaxa ʔal yedey haₕamatematiqa‘it |
| the.proof by the.mathematician |
| b. *haₕokaxa kedey liₕzikot be-pras |
| the proof in order to-win a prize |
| c. *haₕippul beₕkavana be-xoḍeš |
| the.treatment on-purpose in-a month |

⁴ (11a) as well as (14a) do have a coerced AS-nominal reading, in which, as expected, the mathematician is being proved. This grammatical but odd reading is ignored here. The reading is not available in (11b) and (14b) because tippul ‘treatment’, just like tippel ‘treat’, requires a PP object (tippel be-x ‘treated in x’).
(9)–(12) are Free, rather than Construct nominals. If associated with some DP, be it subject, object, or possessor, a Construct nominal may emerge. The formation of such a Construct nominal does not change the relevant AS-nominal or R-nominal diagnostics, as illustrated by (13)–(14):

13. a. *hokaxat ha.matematiqa'it ‘(et ha.te'ana) be-kavana (cf. (9a))
     proof the.mathematician om the.theorem on-purpose
     ‘the mathematician’s proof of the theorem on purpose’

     b. hokaxat ha.matematiqa'it ‘(et ha.te'ana) be-xodsayim (cf. (9c))
     proof the.mathematician om the.theorem in-two months
     ‘the mathematician’s proof of the theorem in two months’

     c. *hokaxat ‘(ha.te'ana) (?al yedey ha.matematiqa'it ) kedey
     proof the.theorem (by the.mathematician) in order
     li-zkot be-pras (cf. (10a))
     to-win in-prize
     ‘the proof of the theorem (by the mathematician) in order to win the prize’

14. a. hokaxat ha.matematiqa'it (cf. (11a))
     proof the.mathematician
     ‘the mathematician’s proof’ (possessor reading only)

     b. *hokaxat ha.matematiqa'it kedey li-zkot be-pras (cf. (12c))
     proof the.mathematician in order to-win a prize
     ‘the mathematician’s proof in order to win a prize’

Following Borer (1984, 1988, 1998), Ritter (1991), Siloni (1996, 2003), and others, I assume that whenever the non-head of a Construct nominal refers to an individual, the structure of Free and Construct nominals is fundamentally alike. Indeed, with a few exceptions, Construct nominals and Free nominals have identical properties when it comes to the properties of derived nominals in general, and AS-nominals in particular. There are, for instance, few if any differences in the range of event structures or in the availability of arguments. As we shall see, however, some syntactic differences do exist which will be discussed in due course. Nonetheless, and unless otherwise noted, all illustrations here and in subsequent chapters are based on Free nominals and unless specifically noted, the reader may assume that all statements concerning derived nominals that are illustrated with Free nominal heads are true for Construct-headed nominals as well.

The word order in AS-nominals in Hebrew is NSO, as in (9) and (13a–b). Alternatively, when the logical subject is expressed by means of a by-phrase (cf. (10), (13c)), the emerging order is [N–O (by-phrase)] (where O=logical, rather than grammatical object). I already suggested, in Chapter 2 (cf. (15)), that the derivation of AS-nominals involves the movement of some (maximal) C-core through a succession of ExP-segments, which eventually gives rise to an incorporation into the nominalizing
affix. At least at times, the C-core may exhaustively contain a root, i.e. a phonological index which is itself unmarked for any category. For Semitic, such a phonological index would consist of a sequence of two to four consonants (or radicals). This root, in turn, is rendered V-equivalent by the functional event structure dominating it.5

We now observe that contrary to English (cf. (17) of Chapter 2 and related discussion), the word order in AS-nominals in Hebrew is exactly what one would expect. Setting aside for the time being Short derivations, i.e. those with either an implicit subject or a by-phrase, a first approximation of the resulting structure is as in (15), in which event structure, including both E and ASPQ, is embedded under CN[V]. The realization of CN[V], in turn, is as in the boxed representation, by assumption the correlate of /πation/ or /πing/ in English:

\[
(15) \quad [\text{N CN[V]-} _{\text{E} \text{ASPQ} \text{DP}} \text{the.authorities} \quad \text{OM the.city (renovate)}]
\]

A comparison with a clausal derivation might be useful here.6

---

5 In the representations below, upper case characters as in HA₁₂R₂₃₁₄ indicate the affixation and the vocalic pattern associated with the morphological pattern. The underlined small capitals, as in the π’s, stand for the location in such a pattern of the radicals of the root, and the subscript stands for the relative order of these radicals, where relevant.

As discussed in some detail in Chapter 11, there are five morphological verbal paradigms in Hebrew (traditionally referred to as “binyanim”). Each morphological verbal paradigm, in turn, is associated not only with the various inflections of the verb, but also with a family of verbal derivatives, including derived nominals, agentive nominals, participles, etc. With the exception of the first morpho-phonological template (binyan I, Qal), where morpho-phonologically unpredictable forms do occur, the morpho-phonology of derived nominals is entirely predictable from the morpho-phonology of the template of the source verb. This raises the distinct possibility that alongside structures such as (15), where the root is rendered V-equivalent by the dominating Extended Projection, there are cases in which the C-core consists of an already derived verb (i.e. the equivalent of patronize), itself comprising a root embedded under some CV[X], which is in turn embedded under an instance of CN[V]; as in (i):

\[
(\text{i}) \quad [\text{N CN[V]-} _{\text{E DP} \text{ASPQ DP CV[X]}} \text{the.authorities} \quad \text{OM the.city (renovate)}]
\]

In Chapter 11, I argue in some detail that the structure in (i) does underlie all derivatives of binyanim II–VII, and elaborate on the morpho-phonological selection which conditions the specific realization of CN[V] in the context of a particular instantiation of a binyan, an instance of CV[X]. However, I also argue that the first pattern, Qal, involves a direct merger of the root which is not mediated by an additional CV[X] functor. This fact notwithstanding, the primary focus in this and the following two chapters is on the event syntax of AS-nominals above the domain of the C-core, and that event structure is never sensitive to the structural differences between (i) and (15) which is internal to the C-core. For that reason, the text discussion ignores the possible (indeed at times obligatory) presence of intermediate verbal C-functors as in (i), and focuses on the simpler structure in (15).

In all examples, and as is particularly significant in the case of Qal derivatives, care was taken to choose derived nominals which are morpho-phonologically fully predictable from the form of the source verb. For the conventions used in transcribing Hebrew, see Note on Hebrew Transcription, p. xxiv. Content glosses for roots are provided for mnemonic purposes, and are to be considered as pure conjectures based on the ultimate Content of the entire expression. Roots as such, recall, have no Content.

6 The term “clause”, recall, is used here to mean, broadly, contexts in which the existence of a VP or an AP is uncontroversial (i.e. propositions, gerunds, small clauses of certain types, etc.).
In (15) as well as in (16), C is rendered V-equivalent by merging with ASP
Q or with E, if ASP
Q fails to merge, see (33) below (but see fn. 5 for the ways in which (15) and similar cases are simplified). While in the clausal case [C=V √špc] re-merges as T and then as E, in the nominal case, in the absence of T, it re-merges as E and then adjoins to CN[V], resulting in the structures in (17a–b). Finally, we may assume that what spells out, in (17b), is the boxed constituent. I return to the specifics of spellout in such cases in Chapter 11.7

7 Note that in clauses the external argument merges with T and then with E, while in nominals, absent T, it merges directly with E. In Borer (2005b) I suggest that the merger with T provides the relevant DP with nominative case, while it is the (re-)merger with E that provides it, ultimately, with its event role. Nominative case is clearly not available inside derived nominals. Furthermore, as we shall see, the subject in AS-nominals receives its case above E
max, and not below it. It therefore follows that there are no particular problems associated with the direct merge with E for nominals.
Embedding (17b) in a full DP structure, and assuming further N-to-D raising would give rise to the (phonologically spelled out) representation in (18):

\[
\begin{align*}
\text{[D ha.šippuc} & \text{[s šippuc [CL šippuc [N šippuc} \text{[E₁D ha.šiltonot]} \text{[ASP₄,DP } \\
& \text{the.renovation} \text{[VP] the.authorities} \text{[c=v ... ]]])])} \\
& \text{the.city}
\end{align*}
\]

Let us suppose now that šel (as well as English of or French de) is the phonological realization of case licensing available in specifiers of nominal Extended Projections, and that lower arguments, in this case the DP in Spec,E, must raise to such a specifier in order to be thus licensed and subsequently šel-marked. As N raises in Hebrew to land, presumably, above the location of such šel marking, the word order remains unaffected. The structure in (19) can now be the direct input to the formation of Free nominals, yielding the correct word order for (9) and similar cases without further manipulation. While the nature of the specific ExP-segment whose specifier hosts the subject remains unspecified in (19), we note, it may, in principle, be any ExP-segment which is a member of the nominal Extended Projection, including CL, #, and D, and others, if indeed needed within that Extended Projection:

\[
\begin{align*}
\text{[D ha.šippuc} & \text{[# šippuc [E₄s-šel ha.šiltonot ... [I₄ ha.šiltonot [ASP₄ ’et ha.ʔir [VP]]])]} \\
& \text{the.renovation} \text{[VP] the.authorities} \text{the.city}
\end{align*}
\]

In Hebrew, both objective case and adverbs are directly attested in AS-nominals. Thus in (9a) we find ’et, a marker of objective case otherwise occurring only in verbal contexts. We further find both be-kavana ‘on purpose’ and be-rašlanut ‘negligently’, which are adverbal in nature, and which otherwise occur only in verbal contexts. Clearly then, some reported problems for the embedding of a verbal constituent within AS-nominals in English do not emerge in Hebrew. In sections 3.3–3.6 below, I turn to a more detailed discussion of these verbal properties. Before doing so, however, it is worthwhile considering some general structural properties of AS-nominals which clearly set them apart from those of R-nominals.

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8 As argued in detail in Borer (1989a) as well as in Borer (2005a) (and see also Siloni 2003), definiteness in Hebrew is a head feature, triggering the movement of N to D. Irrelevant details of DP structure are omitted in (18).

9 In contrast to this, the derivation of Construct nominals (across the board, including those not of the AS-type) must involve a DP moving to the highest functional specifier under D, as argued in detail in Ritter (1991) and Siloni (1996). For a review see Borer (1999a). For an analysis of the relevant constructions in an anti-symmetric approach, see Sichel (2002) and Shlonsky (2004).

The account here remains non-committal on whether there is a specific nominal ExP-segment which is associated with šel (or of), or whether such marking may be associated with any specifier within the nominal Extended Projection, providing it is only instantiated once.
3.2 On Word Order Differences between AS-nominals and R-nominals

Importantly, the word order in AS-nominals is not the same as the word order found in Hebrew nominals which are not AS-nominals, that is, R-nominals, whether derived or underived. Thus consider the R-nominals in (20), and recall, as already noted in Chapter 2, that Hebrew, like Romance, allows for multiple cases of the genitive preposition šel within R-nominals:

(20) a. ha.seper šel Jean ?al ha.štixim [underived]
   the.book of Jean about the.rugs
b. ha.tmuna šel van Gox šel ha.xamaniyot [underived]
   the.picture of van Gogh of the.sunflowers
c. ha.masa? šel Ran el he.harim [“simple” event nominal, underived]
   the.trip of Ran to the.mountains
d. ha.hapaga ha.nokexit šel teaṭron Habima šel Hamleṭ [derived]
   the.production the.current of theatre Habima of Hamlet
   ‘the present Hamlet production of the Habima Theatre’

Shlonsky (1988) observes that the order of the post-head elements in Free R-nominals (but importantly not in the Construct) is flexible, and we note that this is the case for both derived and underived R-nominals, for those interpreted as (simple) events as well as those without an event interpretation altogether. Thus alongside (20a–d) we have (21a–e), with an identical interpretation.10

(21) a. ha.seper ?al ha.štixim šel Jean
   the.book about the.rugs of Jean
b. ha.tmuna šel ha.xamaniyot šel van Gox
   the.picture of the sunflowers of van Gogh
c. ha.tmuna šel ha.xamaniyot šel ha.muzeon
   the.picture of the sunflowers of the museum
d. ha.masa? ‘el he.harim šel Ran
   the.trip to the.mountains of Ran
e. ha.hapaka ha.nokexit šel Hamleṭ šel teaṭron Habima
   the.production the.current of theatre Habima
   ‘the present Hamlet production of the Habima Theatre’

10 Shlonsky (1988) further reports that in the presence of a complement, an author, and a possessor, all three constituents can occur in any order. In my dialect, however, placing the complement after both author and the possessor (in either order) is strongly dispreferred. The relative order of author and possessor in R-nominals, whether derived or underived, as well as its interaction with the order of complements are largely irrelevant to this study, and in the examples below I will concentrate on the contrast between the distribution of the complement, on the one hand, and either possessor or author on the other, which will serve as the narrowest comparison class to cases of AS-nominals with two direct event arguments.
No such freedom of word order is available for AS-nominals. Recall that AS-nominals come in two varieties, illustrated in (5)–(8). One variety, Long AS-nominals, involves the overt instantiation of both external and internal argument, with the latter marked with 'et if a direct argument. The second variety, Short AS-nominals, involves an optional expression of the logical subject as a by-phrase. For both, any alternation in the order of arguments leads directly to ungrammaticality, as (22)–(23) show:11,12

(22) a. *ha.hokaxa 'et ha.ţe?ana šel ha.matematiqa'it the proof om the.theorem of the.mathematician (*ha.hokaxa šel ha. te?ana 'et ha. matematiqa'it)
of the theorem om the mathematician (*ha.hokaxa šel ha. te?ana šel ha. matematiqa'it)
of the theorem of the mathematician

b. *ha.ţippul ba-ba?aya šel ha.şiltonot the.treatment in-the.problem of the.authorities (*ha.ţippul šel ha.ba?aya šel ha.şiltonot)
of the.treatment of the.problem of the.authorities

11 Variations in word order are possible for AS-nominals with a by-phrase and a PP complement (but no direct complement), as (i) illustrates:

(i) a. ha.ţippul b-a.ba?aya ?al yedey ha.şiltonot the.treatment in-the.problem by the.authorities
b. ha.ţippul ?al yedey ha.şiltonot b-a.ba?aya the.treatment by the.authorities in-the.problem

This, in turn, is expected if PPs are not inherently ordered with respect to each other, but are rather assigned structure through linearization principles which are oblivious to argumental interpretation. On the other hand, direct event arguments merge in functional specifiers, which impose on them strict hierarchical conditions and rigid word order. The contrast between (22) and (i) follows directly.

12 (22b) and (23) can be improved if the šel phrase is made considerably heavier, as in (i):

(ii) *ha.hokaxa 'et ha.ţe?ana šel ha.matematiqa'it ha.mukšeret še-ha.universita sakra the.proof om the.theorem of the.mathematician the.talented that-the.university hired be-šana se-ţabra last year

"the proof of the theorem by the talented mathematician that the university hired last year"

Interestingly, no such improvement is available for (22a), regardless of the heaviness of the šel phrase:

The generalization here is a clear one. While the postposing of a heavy šel phrase over a PP is possible regardless of whether it is understood as a subject or an object, postposing a subject over an objective case-marked argument is not. In addition to providing us with further evidence that the status of 'et objects is fundamentally different from that of P-objects, this also tallies with the claim that PPs have a fundamentally distinct structural status from that of event arguments, in this case in either Spec,ASPQ or Spec,FSHL.
The rigidity of word order illustrated by the ungrammaticality of (22)–(23) follows directly from the derivation depicted in (17b)–(19). Any change in the order of the DPs in Spec,E/Spec,ExS on the one hand, and in Spec,ASP_Q on the other hand, could occur only if the DP in Spec,ASP_Q were to move to the specifier of some nominal functional projection over an occupied specifier, or alternatively, if the DP in Spec,E/Spec,ExS were to be postposed somehow, possibly to an adjoined position. In either case, this is movement which we have little reason to sanction. Likewise, if a by-phrase, as is true for other PPs, merges VP-internally, its occurrence to the left of a direct argument, presumably in either Spec,F_SHL or Spec,ASP_Q, would require movement of that PP over an occupied specifier, or alternatively, a rightward movement of the DP in Spec,ASP_Q/Spec,F_SHL. The rigidity of the word order thus follows directly.

Consider now the freedom of word order exhibited in (20)–(21), R-nominals, when compared with the absence of such freedom in AS-nominals. For proponents of the hypothesis that AS-nominals always include an embedded VP, a principled structural distinction between AS-nominals and R-nominals is hardly surprising. After all, there is no prima facie reason to assume that DP-internal constituent structure should mirror in any way that of the event functional complex in (17b)–(19), or, for that matter, the internal structure of an embedded VP under any approach to event structure that would require it. Specifically, as there is no event structure within R-nominals, all complements within an R-nominal must be licensed either through the merger of some preposition (including potentially of or šel), or alternatively, as clauses, but at any rate, never as direct event arguments. “Subjects” of R-nominals, even if licensed in some functional specifier as is often suggested (e.g. Spec,D), are likewise not subjects of grammatical events. Rather, they are licensed in some manner
specific to the internal structure of DPs, and are assigned (by assumption) a Free possessor interpretation.

The asymmetry between the structure of AS-nominals and R-nominals does, however, present a problem for approaches to AS-nominals which deny the presence of an embedded (Extended) VP Projection within them (e.g. those of Grimshaw 1990 or, for Hebrew, Siloni 1997). In such approaches, all arguments are associated with a selecting N head, and their distinct properties are the result of the lexical semantics of these distinct selecting heads. In turn a “subject”, whether interpreted as an event Originator or as a possessor, would always merge with some projection of N and then (in English) possibly re-merge with D. The complement, whether understood as an event argument, as a depicted subject matter (e.g. Mary in a picture of Mary), or as a PP modifier, would always be a sister of N. Alternatively, the nominal subject and the nominal complement merge as dedicated specifiers of functional structure. However, this, too, would fail to distinguish between AS-nominals and R-nominals, as there is little reason to project a radically differing functional structure for these nominals within a Grimshaw-type account. In other words, analyses of AS-nominals as event nominals which fail to postulate an internal verbal constituent of some sort cannot avail themselves of any in-principle structural distinction that could account for the freedom of word order in R-nominals vs. its rigidity in AS-nominals. In all such approaches, it is difficult to see why a PP complement such as ?al ha.šţixim ‘about the rugs’ could precede a possessor-author such as Jean, as in (21a), where such freedom of word order is blocked in an AS-nominal; placing the very same PP complement ?al ha.šţixim before the subject Jean leads to ungrammaticality, as in (22c). If all arguments of AS-nominals and R-nominals are projected exhaustively within the DP, the contrast between (21) and (22)–(23) becomes a mystery.

The plot, as it turns out, thickens when we turn to Construct nominals. Thus Siloni (1997) observes that while R-nominals do display the word order freedom already illustrated in (20)–(21), this is only the case in Free nominals (see also Shlonsky 1988). In Constructs, on the other hand, a very strict word order emerges which, as we shall see, is exactly the opposite of that attested in AS-nominals. Of the word order combinations in (20)–(21), only the ones in (24) are licit (and recall that PP complements do not construct). The Constructs in (25), corresponding to the word order in (20) are ungrammatical, although, in principle, the formation of Constructs with a possessor (in the absence of a complement) is licit, as (26) shows:

(24) a. tmunat ha.xamaniyot šel van Gox
picture the.sunflowers of van Gogh

b. tmunat ha.xamaniyot šel ha.muzeon
picture the.sunflowers of the.museum

13 But also to the approach put forth in Marantz (1997) and subsequent work, according to which roots select an argument in an identical fashion in R-nominals and in AS-nominals, and where a VP or event structure of any sort is attested neither in the AS-nominal reading nor in the R-nominal reading of, e.g., destruction.
The generalization is that Construct formation with either a possessor or an author is absolutely blocked in the presence of a complement. If the complement is a direct one, it can construct with the head, and the possessor/author must occur after the complement, as in (24), as nothing may intervene between the two members of the Construct. In the presence of an indirect complement and a possessor/author, Construct formation is altogether impossible with either argument, as Construct with the possessor/author is blocked, and Construct with a PP is impossible, cf. (25b). Finally, a Construct with the possessor/author is possible, but only when no complement is present altogether, as in (26).15 Now this contrasts sharply with the situation

14 (25a) is greatly improved if van Gogh is interpreted as a modifier, rather than a referential expression, with the gloss ‘a van-Gogh-type picture’. Such a modificational reading is not available in (25b, c) because ha.sipriya ‘the library’ and ha.muzeon ‘the museum’ are definite. For a specific discussion of this effect, see Borer (2009, 2012).

15 While Constructs with the depicted complement or with a modifier are always licit in R-nominals, Constructs with a possessor or an author in Modern Hebrew (in the absence of a complement) appear subject to poorly understood conditions. (i) provides an illustration of one such case of restrictions. No such conditions hold for Free nominals, as (iii) shows, nor are they attested when the Construct is with a complement:

(i) a. *seper ha.yeled
   book the.boy
   ‘the boy’s book’

b. siprey ha.yeled
   books the.boy
   ‘the boy’s books’

c. *tmunat van Gogh
   picture van Gogh
   ‘a picture painted by van Gogh’
   ‘a picture of van Gogh’

d. *tmunot van Gogh
   pictures van Gogh
   ‘pictures painted by van Gogh’
   ‘pictures of van Gogh’

(cont.)
in AS-nominals. Here, in the presence of both subject and object (i.e. in the Long variety, as in (5)–(6)), the only allowed Construct consists of the head+subject. Head +object Constructs are entirely ungrammatical, as illustrated by the contrast between (27a) and (27b) (and recall that in AS-nominals the omission of the complement is impossible). Constructs formed with the understood (direct) object of AS-nominals are only possible if the logical subject is expressed as a by-phrase or is missing altogether (i.e. in the Short variety, as in (7) and (8)), as illustrated by (27c):

(27) a. *harisat ha.ʔir šel ha.‘oyeb
destruction the.city of the.enemy

b. harisat ha.‘oyeb ‘et ha.ʔir
destruction the.enemy om the.city

c. harisat ha.ʔir (?)al yedey ha.‘oyeb
destruction the.city (by the.enemy)

Again, within an approach which assigns the same (nominal) structure to AS-nominals and to R-nominals, schematically as in (28), and with the boxed material representing the presumed domain of Construct formation, it is difficult to see how these facts can be accounted for:

(28) a. \[ E_{52} [N [E_{51} Subj/*Obj \]
    \[ N Subj N Obj]]] AS-nominals
    harisa
    destruction
    oyeb
    ha.ʔir
    enemy
    the.city

b. \[ E_{52} [N [E_{51} Obj/*Subj \]
    \[ N Subj N Obj]]] R-nominals
    tmuna
    picture
    van Gox
    ha.xamaniyot
    van Gogh
    the.sunflowers

Interestingly enough, and regardless of the fact that in Free R-nominals the word order is free, as illustrated in (20) and (21), the possessor/author c-commands the depicted argument, as the paradigm in (29) illustrates (cf. Shlonsky 1988). All

(ii) a. beyt ha.mora
    house the.teacher
    ‘the teacher’s house’

b. batey ha.mora
    houses the.teacher
    ‘the teacher’s houses’

(iii) a. ha.seper šel ha.yeled
    the.book of the.boy

b. ha.sparim šel ha.yeled
    the.books of the.boy

Rosen (1956) argues that head+possessor Constructs are only possible if they indicate part–whole relations or inherent possession. The picture is clearly more complicated, however, as in the grammatical (ibd, iia,b) there is neither part–whole nor inherent possession relations. Rather, there appears to be a singular–plural contrast for (i) which, in turn, is not attested for (ii). This, and related matters, are set aside here.
judgments are for the plausible world knowledge situation, i.e. painters might paint or have pictures of dogs, but dogs do not possess or paint pictures of their owners:

(29) a. ha.tmuna šel kol cayeret₁ šel kalb-a₁
the picture of every painter.f of dog.m/her
‘every painter’s picture of her dog’

b. *ha.tmuna šel kol keleb₁ šel ha.cayaret šel-o₁
the picture of every dog.m of the painter.f of-him
‘every painter’s picture of her dog’

c. ha.tmuna šel ha.keleb₁ šel-a₁ šel kol cayeret₁
the picture of dog.m of-her of every painter.f
‘the picture of his dog of each painter’

d. *ha.tmuna šel ha.cayeret₁ šel-o₁ šel kol keleb₁
the picture of painter.f of-him of every dog.m
‘the picture of her dog of each painter’

Specifically, and under the bound reading, only the quantifier associated with the (common sense) possessor/author could bind a pronoun, and not the other way around. Thus the possessor/author asymmetrically c-commands the complement in both NSO and NOS word orders in R-nominals, in the latter case possibly through reconstruction. By way of offering a broad-stroke account for these effects, suppose we assume that rightward movement and adjunction are excluded and thus cannot serve to derive the position of the possessor/author in the grammatical (29c). Suppose we further exclude the possibility that in (29c) the N-head and the complement are subject to independent, separate fronting, conspiring to result in an NOS word order. If these assumptions are warranted, then the NOS order in R-nominals may only be derived by the fronting of some constituent [NO], including (at least) the N head and the depicted argument, O, but excluding the possessor/author. On the other hand, it appears that precisely such movement must be blocked in AS-nominals. This schematic state of affairs for R-nominals and AS-nominals is illustrated in (30) and (31) respectively.

For expository purposes, I am attempting to create here a minimal pair between R-nominals and AS-nominals. I therefore assume that all non-minimal constituents within nominals merge as functional specifiers above the C-core. ExS-N stands for an ExP-segment of the nominal Extended Projection, presumably present in both R-nominals and AS-nominals. ExS-V stands for proposed ExP-segments of the verbal Extended Projection. (30a) as well as (31a) represent the pre-movement structure. N, for R-nominals, stands for a fully derived noun. C[N[V] stands for a C-functor to spell out, in conjunction with the merged V. The input to Construct spellout is underlined:

\(30\) R-nominals:

\(30\) a. \(\text{ExS-N4} \ldots \text{ExS-N3 Possessor/Author} \text{ExS-N2 ExS-N1 Depicted} [N[N]]\]

b. \(\text{ExS-N4} \ldots \text{ExS-N3 Possessor/Author} \text{ExS-N2 N ExS-N1 Depicted} N[N[N]]\]
Once the schematic structures of R-nominals and AS-nominals are considered, and quite independently of the specific labels for either nominal or verbal ExP-segments, the absence of NOS order in AS-nominals follows directly. There simply is no point in the derivation in which a constituent including the head N and the object, but excluding the subject, exists in AS-nominals. There could exist a constituent consisting of VO, to be sure, but if that constituent were to be raised to any specifier, below or above N, the incorporation of V into N would be blocked by common assumptions, and by extension, the formation of an NO constituent would be impossible. If we now assume that at the very minimum, string adjacency is required between the noun-in-Construct (the head) and the constructed nominal (the non-head), the schematic structures in (30)–(31) yield directly the possibility of constructing N and O, but excluding S, in R-nominals, but not in AS-nominals. It thus turns out that the absence of NOS orders in AS-nominals, but their presence in R-nominals, as well as the existence of [NO]S Constructs in R-nominals but not in AS-nominals, confirm the existence of significant structural differences between them, as well as the existence of a bigger complexity for AS-nominals in requiring an additional C-core distinct from N, i.e. V, to be embedded under the NP, which is not required within R-nominals.16

I now turn to the discussion of specific VP diagnostics associated with AS-nominals, but not with R-nominals.

3.3 The Object Marker ‘et

Two grammatical markers, otherwise unique to verbal contexts, are found in AS-nominals. These are the object marker ‘et, and the preposition ‘al yedey, literally ‘by the hands of’, in actuality the head of a by-phrase. To the extent that both markers only occur in verbal environments and in AS-nominals, they provide us with prima facie strong evidence for the presence of a shared structure for these two constructions, to wit, a verbalizing event functional complex.

Turning first to the object marker ‘et, its distribution in Hebrew is entirely straightforward: it is only available preceding definite DPs or proper names, and, AS-nominals aside, only when these DPs are the “internal” direct arguments in a transitive structure. In turn, ‘et marking is by assumption ambiguous between accusative in quantity structures (and specifically in Spec,ASP_Q, cf. (32a)) and partitive in non-quantity structures (and specifically in Spec,FSHL, cf. (32b)), a distinction which is morpho-phonologically realized in, e.g., Finnish, but not in, e.g., English or in Hebrew (and see Chapter 2, section 3 for a review):

16 The text discussion of R-nominals does fall short insofar as it does not account for the exclusion of [NS]O Constructs in R-nominals in the absence of NO fronting. I leave this matter as well as other important issues concerning the structure of Construct state nominals to future research (see also fn. 15).
(32) a. ha.šīlōnnot šippcu \[[\text{ASPQ}_D \text{'et } ha.\dddot{\text{ir}}] \ldots \text{be-šaloš Šanīm}\]\nthe.authorities renovated \text{om-acc the.city in-three years}

b. ha.šīlōnnot šippcu \[[\text{SHL}_D \text{'et } ha.\dddot{\text{ir}}] \ldots \text{be-mešek šaloš Šanīm}\]\nthe.authorities renovated \text{om-prt the.city during three years}

The null hypothesis is that the event structures in (32) may be embedded within AS-nominals, and as a result, AS-nominals come in a quantity variety (cf. (33a)) and a non-quantity variety (cf. (33b)). Note, importantly, that the event reading and properties in (33) notwithstanding, these are clearly nominally headed constituents (rather than, e.g., gerunds), as the occurrence of the definite articles and adjectives illustrates (irrelevant aspects of DP structure suppressed):

(33) a. \[ D \text{ha.šippuc} \]\nthe.renovation \text{of the authorities } \[ N \text{šippuc} \text{[} E \text{ha.šīlōnnot} \text{]} \]
\text{om-acc the.city}

b. \[ D \text{ha.šippuc} \text{[šel ha.šīlōnnot]} \]\nthe.renovation \text{of the authorities } \[ N \text{šippuc}_E \text{[ha.šīlōnnot]} \text{[šml}_D \text{'et } ha.\dddot{\text{ir}} \text{]} \ldots \text{]} \text{]]] \text{om-prt the.city}

(34) a. \[ D \text{ha.šippuc} \text{(ha.xafuz/ha.rašlani)} \text{šel ha.šīlōnnot \text{'et}} \]
the.renovation \text{(the.rushed/the.sloppy) of the authorities om-acc}
batey ha.\dddot{\text{ir}} \text{be-šloša xodašim}
houses-the.city in-three months
‘the rushed/sloppy renovation of the town’s houses in three months’

b. \[ D \text{ha.šippuc} \text{(ha.bilti poseq/ha.nimšak)} \text{šel ha.šīlōnnot} \text{'}et}
the.renovation \text{(the.ceased/the.continuing) of the authorities}
batey ha.\dddot{\text{ir}} \text{be-mešek ha.šanīm ha.‘axronot}
\text{om-prt houses the.town during the last few years}
‘the authorities’ endless/continuing renovation of the town’s houses during the past few years’

3.3.1 Siloni’s analysis of ‘et in derived nominals

The most detailed challenge to the presence of a VP in AS-nominals, and responding directly to the VP-based analyses in Hazout (1991, 1995) and in Borer (1991/1993) is that mounted in Siloni (1997), who subscribes, rather, to the original analysis put forth in Grimshaw (1990), according to which AS-nominals, just like R-nominals, are pure nominal structures. Her treatment offers an alternative account for many of the verbal properties of AS-nominals, and in the following sections, the specifics of her challenge will be addressed.

Any account which denies the presence of a verbal structure (however derived and structured) within AS-nominals must be accompanied by the claim that a systematic syntactic description of the distribution of ‘et in Hebrew is impossible. And indeed, this is precisely the conclusion reached by Siloni (1997). Pointing to a number of apparently problematic aspects of the distribution of ‘et in AS-nominals, Siloni
concludes that the distribution of ‘et in derived nominals is sufficiently distinct from that of classical VPs to warrant its analysis as an inherent, rather than structural accusative case, and hence no longer as evidence for a VP.

Before turning to a detailed discussion of the claimed divergent distribution of ‘et, one general point is worth noting. Although Siloni’s fundamental claim is that the distribution of ‘et in nominals is lexically governed by the noun, and is entirely divorced from the presence of a verbal constituent, it remains the case that none of the cases discussed by Siloni involve an ‘et which may be present in nominals in contexts which are barred for V contexts (e.g. with non-direct objects), nor do any of her cases involve nouns that are not clearly derived from verbs. Under the best construal, then, the distribution of ‘et in AS-nominals is a strict subset of its distribution in classical VP contexts, and renders the licensing of ‘et by a V constituent in AS-nominals necessary but possibly not sufficient. And indeed, as we shall see, all cases which do not license ‘et in nominals but license them in verbal contexts have alternative explanations, crucially relying precisely on the ways in which the constituent structure of AS-nominals does differ from that of clausal VPs.

Consider first the ungrammaticality of ‘et in (35a) (and compare with (35b), discussed by Siloni 1997). If, indeed, re’ayon ‘interview’ in (35) is a complex event nominal, in the sense of Grimshaw (1990), and if complex event nominals contain a verbalizing structure, and hence an internal VP, one would have predicted the occurrence of ‘et in (35a), on a par with its verbal(ized) counterpart in (36). However, (35a), with ‘et, is clearly ungrammatical. It follows, Siloni argues, that the distribution of ‘et in clausal VP domains does not carry over to that of de-verbal nominals, and must be stated separately for the latter:

(35) a. *ha.re’ayon (šel Dan) ‘et ha.mu?amad  
   the.interview (of Dan) om the.candidate  

b. ha.re’ayon šel ha.mu?amad  
   the.interview of the.candidate  

(36) Dan ri’ayen ‘et ha.mu?amad  
   Dan interviewed om the.candidate  

The argument here, however, relies crucially on the assumption that re’ayon ‘interview’, is a complex event nominal, or an AS-nominal in our terminology. However, this assumption is wrong. While re’ayon ‘interview’ clearly does denote a (simple) event (cf. (37)), a close examination reveals that it has none of the diagnostics associated with AS-nominals (or complex events). It does not allow either aspectual modifiers or adverbs, otherwise allowed in AS-nominals, as (37a–b) illustrate, nor can it co-occur with by-phrases and implicit argument control, as (39a–b) illustrate:

(37) a. ha.re’ayon nimšax šaloš ša?ot  
   the.interview lasted three hours  

b. ha.re’ayon hitraxeš lipney ha.cohorayim  
   the.interview happened before noon
As it turns out, the failure of re’ayon ‘interview’ to be an AS-nominal is hardly surprising, given the fact that it is not in actuality a de-verbal nominal, and is altogether not derived from the verb ri’ayen ‘interview’. There does exist a morphologically regular nominal derived from the verb ri’ayen, likewise with a clear event reading, ri’ayun ‘interviewing’. For all the ungrammatical cases in (35), (38)–(39), the corresponding AS-nominals with the regularly derived nominal, ri’ayun, are fully grammatical, ‘et occurrence included:

The noun re’ayon ‘interview’, in turn, belongs to a well-defined non-verbal nominal template with the pattern rIRARON. Some members of this group, likewise not derived from verbs, are in (43):

In actuality, it is the verb ri’ayen ‘interview’ which is historically derived from the noun, by a process of root formation that involves the extraction of the entire consonantal tier of the source word, including suffixal consonants, and giving rise to a new quadro-consonantal root, \(\pi\sqrt{R \text{YN}}\), from which the verb is then derived.
Once in existence, the root gave rise to both verbs and nominals derived from them, and hence ri'ayun, the regular derived nominal associated with binyan III. The noun re'ayon, then, is a Hebrew counterpart of simple event nominals such as event, class, lesson, or indeed interview, already discussed in section 1 of Chapter 2, which are not derived from verbs, and hence can never be AS-nominals. Given this conclusion, the contrast between (35), (38)–(39), and (40)–(42) actually strengthens the claim that there is a verbal constituent in AS-nominals, rather than weakens it, as it allows for the presence of ‘et precisely where a verbal source is morphophonologically available, but not otherwise. All the more so given the fact that re'ayon and ri'ayun do share a root and Content, and are also phonologically extremely similar.

Two more cases are noted by Siloni (1997) in which the distribution of ‘et in the nominal domain differs from its distribution in the verbal domain. First, following Borer (1984), she notes the obligatoriness of ‘et in derived nominals, leading to the ungrammaticality of (44c), vs. its optionality in the clausal context in (44c–d). Second, she notes that the pronominal forms related to ‘et are barred in derived nominals, again in contrast with their free distribution within clausal VPs, as illustrated by (45):18

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17 I return to this paradigm and to root extraction of this type in Chapter 9, where I discuss the claim, put forth in Arad (2003), that words thus derived from other words, in Hebrew, have different properties from words derived directly from roots.

18 Siloni's original examples are all with Construct nominals, converted here to Free nominals for ease of exposition.
c. Rina hizmina 'oto
   Rina invited 'et.3.SG.M

d. Rina hizmina 'et ha.'orxim
   Rina invited om the.guests

The judgments are not in dispute here. (44c) and (45a) are clearly ungrammatical. As we shall see directly, however, the ungrammaticality here is entirely independent from the presence or absence of a verbal constituent within AS-nominals.

Consider first (44c), a strange effect, if there ever was one. There certainly is nothing semantically wrong with destroying a city, nor is the corresponding nominal in English ungrammatical. And yet, the obligatory occurrence of 'et in this structure, together with the fact that 'et may only occur preceding a definite DP, result in the strange impossibility of having an indefinite object in this context. This, Siloni claims, is precisely what one would expect if there is no structural objective case assignment in AS-nominals, and instead, a homophonous variant of 'et, an inherent case assignor, must be inserted, which in turn imposes its own restrictions, i.e. a definite complement. According to this claim, 'et within the verbal domain of a clause is not a case assignor in itself, but rather a phonological spellout of objective case in definite contexts. Not so in the nominal domain, where 'et, itself, is the assignor of case, and its absence thus leads to ungrammaticality. It thus follows that for reasons to do entirely with case, direct complements in AS-nominals in Hebrew must be definite.19

But do direct objects in derived nominals in Hebrew need to be definite? Is the generalization here the correct one to begin with? A closer examination reveals that indefinite objects in derived nominals in Hebrew are fully grammatical, as all cases in (46) clearly show:

(46) a. ha.harisa šel ha.'oyeb ?arim rabot b.imyuxad
   the.destruction of the.enemy cities many particularly
   ‘the enemy’s destruction of particularly many cities’

b. ha.hapcaca šel ha.'oyeb šloša gšarim kol boqer
   the.bombing of the.enemy three bridges every morning

c. ha.'akila ha.tkupa šel Rina sušariot ve-šokolad
   the.eating the.frequent of Rina candies and-chocolate
   be.diyuq lipney ha.'aruxa
   exactly before the.meal

19 We note a certain logical flaw in Siloni’s argument here. If the nominal and the verbal occurrences of 'et are in fact grammatically entirely distinct, there is no prima facie reason to assume that the semantic restrictions on one, i.e. the definiteness restriction, should translate into identical semantic restrictions on the other. This point is not pursued here, given the forthcoming conclusion that Siloni’s argument is based on partial data, and vanishes altogether once a broader range of facts is considered.
In all the cases in (46), the direct object is indefinite and is clearly grammatical inside an AS-nominal without the insertion of 'et or any other overt case marker. What, then, is the difference between the ungrammaticality of (44c) without 'et and the grammaticality of (46a–c), likewise without 'et? The obvious difference involves the heaviness of the DPs in (46). Perhaps, one might suggest, such heaviness allows them to be postposed, and hence escape the need to receive case? This solution, we note, would still be compatible with the assumption that objective case is only available in AS-nominals in the presence of 'et, unlike the situation in propositional VPs.

Postposing, however, is neither plausible here, nor would it be a solution to the problem. Note that in (46b–c) the direct objects, heavy as they might be, nevertheless occur to the left of an adjunct, making a postposing account prima facie implausible. More damagingly, the postposing of DPs does not typically excuse them from requiring case. Thus English (47) remains ungrammatical in the absence of of-insertion, in spite of the clear postposing of a heavy DP, and the postposed object in the Hebrew clause in (48) does not license the omission of 'et either:

(47) the enemy’s destruction at dawn *(of) three bridges, seven radio stations, and one airport

(48) ha.oyeb haras lipnot boqer *(‘et) šlošt ha.gšarin, the.enemy destroyed at dawn *(om) three the.bridges, *(‘et) ševa? taxanot ha.radio, ve-*(‘et) sde ha.te’upa *(om) seven stations the.radio and-*(om) the.airport ‘the enemy destroyed before dawn *(om) the three bridges, *(om) the three radio stations and *(om) the airport’

Rather, I propose, there is nothing special about (46). The DP objects in (46) are assigned objective case in the normal way objective case is assigned in Hebrew, which is to say, in [Spec,ASP₀] or [Spec,FSHL], and being indefinite, that objective case is not phonologically realized as 'et. There is, however, something special about (44c), namely, the occurrence of a light bare nominal in a position which is not adjacent to a head. That a restriction against such light nominals being separated from the head does indeed exist in Hebrew can be clearly illustrated within the verbal domain with subject–verb inversion, where the subject intervenes between the verb and the object. Similar effects emerge directly, as illustrated by the grammatical (49a,c) and (50) when contrasted with the ungrammatical (49b, d):

(49) a. lipney še-haras ha.oyeb ‘et ha.ʔir before the enemy destroyed om the.city
b. *lipney še-haras ha.oyeb ʔir before that-destroyed the enemy city
c. axrey še-šippca ha.ʔira ‘et ha.gešer after that-renovated the.municipality om the.bridge ‘after the municipality renovated the bridge’
In turn, if this account is on the right track, it gives us an immediate explanation not only for the contrast between (44a) and (46), but also for the contrast between (45a) and (45c). Here, too, a light element, a pronominal, is non-adjacent to an (overt) head, a configuration that would give rise within the verbal domain to an ungrammaticality even stronger than that attested in (49b, d):

51 a. *lipney še-hizmin David ʿota
    before that-invited David her

b. lipney še-hizmin David ʿet Rina
    before that-invited David om Rina

In fact, the fronting of the verb in contexts such as (51) typically involves both the verb and the pronoun, the latter thus prevented from being stranded, and thereby providing further support for the (phonological) clitic-like nature of these light elements:

52 lipney še-hizmin ʿota David
    before that-invited ʿet.3.sg.f David

We should not be surprised now by the improvement to (45a) and (51a) brought about by coordinated pronouns, as in (53), or by the ungrammaticality of the movement of such coordinated pronouns with the verb, illustrated in (54). Nor should we be surprised to find out that the restriction pointed out by Siloni (1997) is quite independent of ʿet, and is equally attested with light prepositional pronouns within both the verbal and the nominal domain, as in (55a) (and compare with (55b–d)) and in (56a) (and compare with (56b)):

53 a. ha.hazmana šel Rina ʿoti ve-ʿotka
    the.invitation of Rina me and you

b. lipney še-hizmin David ʿoti ve-ʿotka
    before that-invited David me and you

54 *lipney še-hizmin ʿoti ve-ʿotxa David
    before that-invited me and you David
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(55) a. ha.pgiʔa šel Rina *b-i/b-a.šaxen/be-šaxen etmol
the.hurting of Rina in-me/in-the.neighbor/in-neighbor yesterday
‘Rina’s hurting *me/the neighbor/a neighbor yesterday’

b. Rina pagʔa b-i/b-a.šaxen/be-šaxen etmol.
Rina hurt in-me/in-the.neighbor/in-a neighbor yesterday
‘Rina hurt me/the neighbor/a neighbor.

c. lipney še-pagʔa Rina *b-i/b-a.šaxen/be-šaxen etmol
before that hurt Rina me/in-the.neighbor/in-a neighbor yesterday
‘before Rina hurt me/the neighbor/a neighbor yesterday’

d. lipney še-pagʔa b-i Rina etmol
before that hurt me Rina yesterday

(56) a. *ha.matana šel Rina l-i
the.present of Rina to-me
‘Rina’s present to me’

b. ha.matana šel Rina le-Aliza/l-i ve-le-ka/le-zar
the.present of Rina to-Aliza/to-me and to-you/to-stranger
‘Rina’s present to Aliza/to me and to you/to a stranger’

Similar contrasts are attested in the nominal structures in (57), argued by Hazout (1991, 1992), to be gerunds lacking an N head altogether:20

(57) a. ??bi-knot ha.yeled seper
in-buy the.boy book
‘while the boy bought a book’

20 Siloni (1997) argues that the distribution of indefinites and the pronominal derivatives of ’et in gerunds, in the sense of Hazout (1992), actually differs from that of derived nominals, as based on the grammaticality of (i), when compared with the ungrammaticality of (44c), (45c):

(i) a. bi-knot-o seper
in-buy-3.SG.M book
‘while he bought a book’

b. bi-r’ot-am ‘oto
in-see-3.PL.M him
‘when they saw him’

A closer investigation of (i), however, especially when compared with the ungrammatical cases in (57), reveals that the cases in (i) do not form a minimal pair with the ungrammatical cases of AS-nominals in (44c), (45c) in one crucial respect: in (i), the element intervening between the head and the object, be it the indefinite nominal in (ia) or the pronominal form in (ib), is itself a clitic, while in (44c) and in (45c), as well as in (57), the intervening element is a fully phonologically realized DP. The parallel cases to (i) within the AS-nominal domain are thus as in (ii), and as indeed expected, (iia–c) are fully grammatical:

(ii) a. ‘ahabat-a ‘oto
love-3.SG.F him

b. ‘akilat-i tapuxim
eating-1.SG apples

c. pgišat-a b-i
hurt-3.SG.F in-me
Returning to the ungrammaticality of (44c) and (45a), we note that as in AS-nominals the verb always moves away, light complements in either Spec,ASP, or to Spec,F become impossible. A movement of such a complement with the verb, in turn, would be expected to block the incorporation into the relevant C,N[V]. To the extent that both indefinite direct objects and pronouns do occur in some contexts in AS-nominals, and are in turn excluded in the very same contexts where they are also excluded in similar verbal and gerundive contexts (the latter in the sense of Hazout 1991, 1992), Siloni’s argument for distinct mechanisms of ‘et insertion in derived nominals and in sentential VPs is seriously undermined. As we shall see, a number of other arguments made by Siloni (1997) against the presence of a VP in AS-nominals can be accounted for by appealing to the same prosodic constraint.

3.3.2 ECM constructions

Siloni (1997) presents one more argument for the special status of ‘et in derived nominals, based on the ungrammaticality of ECM constructions with ‘et in derived nominals, as in the contrast in (59):

\[
\begin{align*}
(59) \quad & a. \quad \text{ha.me'am'en ra'a 'et ha.mit?amelet nopelet} \\
& \quad \text{the.trainer saw om the.gymnast fall} \\
& b. \quad *\text{re'i yat ha.me'am'en 'et ha.mit?amelet nopelet} \quad [\text{Construct nominal}] \\
& \quad \text{seeing the.trainer om the.gymnast fall}
\end{align*}
\]

That the problem with (59b) is, indeed, related to ‘et, Siloni argues, is evident when the ungrammaticality of (59b) is contrasted with the grammaticality of (60):

\[
\begin{align*}
(60) \quad & \text{re'i yat ha.mit?amelet nopelet} \quad [\text{Construct nominal}] \\
& \quad \text{seeing the.gymnast fall}
\end{align*}
\]
As we will see shortly, 'et never occurs in the absence of an overt subject, and ha.mit?amelet ‘the gymnast’ in (60) is not assigned case by 'et, but rather is presumably marked as genitive through the formation of a Construct nominal. The ungrammaticality of (59b), Siloni argues, crucially cannot be attributed to the impossibility of raising from the subject of a small clause, as such raising from a small clause does not lead to ungrammaticality in (60). The source for the contrast, Siloni reasons, is that in (59b) ‘the gymnast’ fails to be case-marked, because 'et is not available. As 'et clearly is available as an ECM case marker in verbal contexts, its failure to be available in (59b) supports its status as an inherent case marker, which does not allow ECM effects.

Ironically, we note, if Siloni’s analysis is correct then Hebrew derived nominals allow Raising-to-Object, a property claimed in Chomsky (1970) to be impossible for derived nominals and thus, from his perspective, a diagnostic setting apart true verbal cases from derived nominals. And indeed, the equivalents of both (59b) and (60) are ungrammatical in English:

(61)  a. *Jane’s consideration/considering of Kim intelligent
     b. *David’s perception/perceiving of Barbara falling

(62)  a. *Kim’s consideration intelligent (by Jane)
     b. *Barbara’s perception falling (by Bill)
     c. *The consideration/considering of Kim intelligent (by Jane)
     d. *The perception/perceiving of Barbara falling

As it turns out, Hebrew may or may not allow Raising-to-Object from small clauses, but the cases cited by Siloni may not be the relevant ones, nor is the contrast she is highlighting. For myself, I find the putative contrast in the case of (59b)–(60) quite difficult. While I definitely share the intuition that (59b) is ungrammatical, I find (60), if anything, worse. The pattern here, however, appears to have little to do with ECM effects of any sort, and rather is associated with the fact that nominals derived from perception verbs in general act rather differently from other derived nominals. First, unlike non-statives, even licit variants are much deteriorated as Free, rather than Construct, nominals, even when no raising can possibly be involved.21 Second, and more importantly from our perspective, they are extremely deteriorated, if not altogether ungrammatical, whenever the subject is not overt, regardless of the presence or absence of a small clause, again appearing to pattern with English in this respect:22

---

21 (i)  a. *ha.re’iya sel ha.me’amen ‘et ha.mit?amelet
       the.seeing of the.trainer om the.gymnast
       ‘the trainer’s seeing of the gymnast’
     b. *ha.smìña sel ha.psantran ‘et ha.mangina
       the.hearing of the.pianist om the.melody
       ‘the pianist’s hearing (lit.) of the melody’ (cf. (63c))

22 We turn shortly to a fuller discussion of ?al yedey ‘by’ in derived nominals. Note, nevertheless, and as concerning (63d), that ?al yedey is typically restricted to agentive and instrumental contexts
In all these cases, a non-stative ‘coming to perceive’ reading (e.g. as in hearing a bell or seeing a film through) creates considerable improvement, as predicted (although Free nominals are still impossible):

Non-stative perception verbs rarely allow a small clause complement in Hebrew (effectively, a resultative in such cases). In turn, the attempt to replicate Siloni’s (1997) effects with an actually attested ECM small clause in a non-stative, resultative context,

(cf. Alexiadou and Doron 2012). It is, nonetheless, typically licit, albeit marginal, with the passive verbal equivalents of re‘iya ’seeing’ and šmi‘a ‘hearing’:

(i) ha.mit?amelet nim?ata (al yedey ha.me‘amen); ha-mangina n?išme‘a (al yedey ha.psantran)  
    the.gymnast seen.Pass (by the trainer)  the-melody heard.Pass (by the pianist)
returns the result that both the 'et and non-'et variants are essentially acceptable, and at any rate, considerably better than either (59b) or (60): 23

(65) a. mec'iat ha.šopeṭet 'et ha.ne'ēšam xayab ba-din
   finding the.judge om the-defendant guilty
   'the judge’s finding of the defendant guilty’
   
   b. mec'iat ha.ne'ēšam xayab ba-din (ʔal yedey ha.šopeṭet)
   finding the.defendant guilty ( by the.judge)
   'the finding of the defendant guilty’

Returning to Siloni’s original argumentation, there appears to be little case here for differentiating 'et in verbal contexts from 'et in derived nominals from the behavior of ECM constructions. The discussion, nonetheless, sheds important light on at least one of the contrasts noted in Chomsky (1970) between verbal contexts (including gerunds) and nominal contexts (those relevant for AS-nominals). As it turns out, ECM constructions are barred in derived nominals, but only in stative contexts. Resultative contexts, on the other hand, are licit not only in Hebrew, as in (65), but in English as well:

(66) a. Kim’s hammering of the metal flat
   b. the hammering of the metal flat (by Kim)
   c. the rooster’s crowing of the children awake
   d. the crowing of the children awake by the rooster
   e. your burning of the kitchen walls black
   f. the burning of the kitchen walls black (by you)

Note now that other contexts considered by Chomsky (1970) as differentiating between gerunds and derived nominals are stative as well, to wit Tough contexts and Raising-to-Subject contexts. It may very well turn out that for reasons that certainly must be explained, stative AS-nominals, which is to say nominals constructed of stative event structure, are subject to restrictions that do not hold for eventive ones. An attempt at a full explanation along these lines is, however, set aside here for future research. For some intriguing discussion on raising in the context of derived nominals, see Sichel (2007).

23 (65) and its original verbal configuration is the only case of a non-stative, resultative-like small clause in Hebrew that I am aware of. While it may be a borrowing in its juridical use, the verb maca 'find' is actually attested in the Bible in a small clause construction, but a stative one with a depictive rather than a resultative small clause. In this particular use, a derived nominal is extremely deteriorated, patterning with the statives already discussed:

(i) we-moce ani mar mi-mawet 'et ha.šiša
   and-find I bitter than-death ost the.woman
   'and I find women more bitter than death’ (Ecclesiastes 7.26)
### 3.4 The Preposition ʔal yedey

Like 'et, the preposition ʔal yedey has an exclusively verbal distribution, and other than within AS-nominals, occurs only as a marker for the (demoted) external argument in verbal passive constructions, as (67) illustrates (and compare with the AS-Nominals in (68)):

(67) a. ha.ʔir šuqqma ʔal yedey ha.šištonot
    the.city rehabilitated.pass by the.authorities

b. ha.maxaze niktab ʔal yedey Rani
    the.play written.pass by Rani

(68) a. ha.šiqqum šel ha.ʔir ʔal yedey ha.šištonot
    the.rehabilitation of the.city by the.authorities

b. ha.ktiba šel ha.maxaze ʔal yedey Rani
    the.writing of the.play by Rani

I will assume, as shown in Alexiadou and Doron (2012), that ʔal yedey is by and large restricted to agentive and instrumental contexts, although this restriction, occurring in a parallel fashion in verbal and nominal contexts, is orthogonal to our main discussion. It should be noted, however, that although ʔal-yedey is agentive, it is not possible in “authorship” contexts such as those in (69). In that, it patterns with Spanish por (in Grimshaw’s 1990 typology), and not with English by. In the relevant contexts of (69), the preposition me’et which specifically denotes source/authorship is used:

(69) tmuna/seper/maxaze me’et/*ʔal yedey Almann
    picture/book/play by Almann

Nor is ʔal yedey possible in R-nominals, including simple event nominals:

(70) a. ha.bxina (*ʔal yedey ha.more) hitqayma b-a.boqer
    the.test (*by the teacher) took-place in-the.morning

b. ha.masə? le-Afrika (*ʔal yedey Xagay) hitxil be-april
    the.trip to-Africa (by Xagay) started in-April

c. ha.šeʔur be-balšanut (*ʔal yedey Roumi) hitxil b-a.zman
    the.lesson in-linguistics (by Roumi) started on-time

As in the case of ‘et, characterizing the distribution of ʔal yedey in AS-nominals without a VP would require an ad hoc stipulation. We note, however, that in one important respect the distribution of ʔal yedey in AS-nominals does differ from its distribution in clausal verbalizing contexts, displaying, in actuality, greater freedom. Thus an ʔal yedey phrase is available in AS-nominals to express “external” arguments in contexts which do not allow such “demotion” in the verbal domain. Specifically, compare (71) with (73), noting that all cases under consideration here involve prepositional complements which, by hypothesis, cannot be subject to a direct
passive derivation, and that impersonal passive, while present in the Hebrew clausal verbal domain, is highly restricted. It therefore emerges that in the nominals in (71), a by-phrase is attested which can occur neither in an active (cf. (72)) nor in a passive (cf. (73)) verbal environment with the source verb:

(71) a. ha.ṭippul ba-baʔaya ʔal yedey ha.memšala
   the.treatment in-the problem by the.government

   b. ha.ḥalika le-Kanosa ʔal yedey ha.keyṣar
      the.going to-Kanossa by the.emperor

(72) a. *(ze) tippel ba-baʔaya (ʔal yedey ha.memšala)
      (it) treated in-the.problem (by the.government)

   b. *(ze) halak le-Kanosa (ʔal yedey ha.keyṣar)
      (it) go to Kanossa (by the emperor)

(73) a. *ṭuppal ba-baʔaya (ʔal yedey ha.memšala)
      treated_PASS in-the.problem (by the.government)

   b. *nḥełak le-Kanosa (ʔal yedey ha.keyṣar)
      go_PASS to Kanossa (by the emperor)

Interestingly enough, at least for the verb tippel ‘treat’, there is a passive variant as in (74):

(74) ha.baʔaya tuppla (ʔal yedey ha.memšala).
      the.problem treated_PASS (by the.government)

      ‘The problem was treated (by the government).’

The verbal passive of tippel ‘treat’, note, involves the loss of the preposition be- ‘in’ present in the active. No such loss of preposition is attested in the AS-nominal derivation in (71a), nor is such a loss of the preposition possible in the AS-nominal derivation, as (75) shows:

(75) a. *ha.ṭippul šel ha.baʔaya (ʔal yedey ha.memšala)
      the.treatment of the.problem (by the.government)

   b. *ṭippul ha.baʔaya (ʔal yedey ha.memšala) [Construct nominal]
      treatment the.problem (by the government)

Although both Hazout (1991) and Engelhardt (1998, 2002) subscribe to the view that AS-nominals do contain a VP constituent, they nonetheless consider the obligatory omission of the preposition be-in (74) vs. its obligatory presence in (71a) as evidence against deriving cases such as (71) by a (correlate of) passive, and hence by extension, also against deriving all cases of Short AS-nominals (e.g. as in (68)) by passive (contra the analysis in Borer 1991/1993 as well as in Chapter 5 of this book). As a result, they must subscribe to the view that there are two distinct possible sources for ʔal yedey—one which correlates with a (traditional) passive derivation and which occurs in clausal contexts, and another which is specialized to AS-nominals and which, by assumption, cannot passivize, although in their (respective) accounts, AS-nominals do
contain an embedded VP. In Chapter 5, I will argue explicitly that Short AS-nominals are cases of passive within AS-nominals in both English and Hebrew. In that context, and specifically in section 5 of that chapter, I revisit the cases in (72)–(75) and offer a solution to the problem of the vanishing preposition.

## 3.5 Adverbs

### 3.5.1 Distribution, categorial classification

As Hazout (1991) shows, adverbs occur in AS-nominals in Hebrew, and further, they may co-occur with adjectives and determiners within the same AS-nominals, thereby excluding the possibility that Hebrew AS-nominals are sometimes true nominals (when adjectives, quantifiers, or definite articles occur) and sometimes gerunds (when adverbs and ‘et occur):24

(76) a. ha.bdiqa ha.memošeket šel ha.doxot be-yesodiyyot kazot
the.examination the.prolonged of the.reports thoroughly so
bal yedey ha.meqpxot xaspal liqiyyim xamurim.
by the.supervisors revealed deficiencies serious
‘The prolonged examination of the reports with such thoroughness by the supervisors revealed serious deficiencies.’

b. ha.dikkuy ha.takup šel ha.caba be-‘akzariyyut /be-kavana
the.oppression the.frequent of the.army cruelly /on purpose
‘et ha.’oklosiya gorem le-harbe sin’a.
om the.population causes to-much hatred
‘The army’s frequent cruel/intentional oppression of the population gave rise to much hatred.’

Siloni (1997), in highlighting differences between propositional VPs and AS-nominals, points to some asymmetries in the distribution of adverbs as well. Specifically, she shows that some adverbs cannot occur with AS-nominals, although they do occur within the clausal verbal domain, as (77)–(78) show:

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24 This is contra Fassi Fehri (1987), who argues that AS-nominals in Semitic are gerunds, rather than derived nominals. We note that in the nominal constructions analyzed by Hazout (1991, 1992) as gerunds, where nominalizing affixation is absent and the form used is, rather, that of the (bare) imperfective stem, neither adjectives nor šel insertion are licit, resulting in an obligatory Construct formation, where the non-head is, by assumption, genitive (and overtly so, in Standard Arabic):

(i) ‘axarey ekol Dan (*ha.mahir/*ha.mehira) ‘et ha.tapuax be-mehirut
after “eating” Dan (*the.quick.m/*the.quick.f) om the apple quickly

(ii) ‘axarey ‘ekol šel (ha.) yeled ‘et ha.tapuax
after eating of (the) boy om the apple

Adverbs in AS-nominals are reported in Chinese by Fu (1994), and in Greek by Alexiadou (1997, 2001). I return to a discussion of the occurrence of adverbs in AS-nominals in English in section 3.7.3.
(77) a. Ran biššel 'et ha.cli maher
Ran cooked om the.roast quickly
b. Ran biššel 'et ha.cli le'at
Ran cooked om the.roast slowly

(78) a. *ha.biššul šel Ran 'et ha.cli maher
the.cooking of Ran om the.roast quickly
b. *ha.biššul šel Ran 'et ha.cli le'at
the.cooking of Ran om the.roast slowly

Instead, Siloni notes, adverbial meaning such as ‘quickly’ and ‘slowly’ must be expressed as a PP, an option independently available in Hebrew for the verbal domain:

(79) a. Ran biššel 'et ha.cli be-mehirut
Ran cooked om the.roast in-quickness
b. Ran biššel 'et ha.cli be-‘iṭiyut
Ran cooked om the.roast in-slowness

(80) a. ha.biššul šel Ran 'et ha.cli be-mehirut
the.cooking of Ran om the.roast in-quickness
b. ha.biššul šel Ran 'et ha.cli be-‘iṭiyut
the.cooking of Ran om the.roast in-slowness

The reason for the contrast, Siloni suggests, is that only (real) VPs license bare adverbs. In the absence of a VP, a bare adverb is not possible. PPs, on the other hand, are independently licensed in nominal structures, and are hence licensed in AS-nominals as well. In turn, they can function as event modifiers, but only if the relevant nominal is a complex event nominal in the sense of Grimshaw (1990).

We note in response that although the ungrammaticality of (78a–b) is undisputable, the reason cannot at all be the impossibility of bare adverbs in AS-nominals, as the grammaticality of (81) shows:

(81) a. ha.hapgaza šel ha.caba 'et ha.?key maher ve-be-akzariyut
the.bombing of the.army om the.city quickly and-in-cruelness
‘the army’s bombing of the city quickly and cruelly’
b. ha.hapgaza šel ha.caba 'et ha.?key le'at le'at / maher maher
the.bombing of the.army om the.city slowly slowly / quickly quickly
‘the army’s bombing of the city very slowly/very quickly’
c. ha.hitqaššrut (šel ha.hanhala) el Dan yeširot
the.contacting (of the.management) to Dan directly
‘the management’s contacting of Dan directly’
d. xacayat Dan 'et ha.park alaksonit [Construct nominal]
crossing Dan om the.park diagonally
‘Dan’s crossing of the park diagonally’
In (81a), a bare adverb is coordinated with an adverbial PP. The result is grammatical within an AS-nominal (as it would be in a clause), showing that a constraint on a constituent type here is on the wrong track. Not only is a bare adverb licit in the AS-nominal in (81a), but its coordination with a PP shows that it is indeed of the same categorial type as the adverbial PPs, and thus it cannot be assumed that it is independently barred in AS-nominals. Further, in (81b) bare adverbs are reduplicated (giving rise to an intensified reading), but also resulting in grammaticality, although the adverb remains bare. In (81c–d) two additional morphological types of bare adverb are shown to be fully licit in AS-nominals.

Recall now that I suggested that the absence of bare direct objects in AS-nominals is due to prosodic effects, barring light constituents unless adjacent to a head. Note now that the very same account can be extended to explain the contrast between (81) and (78) as well, although the resolution of how light “light” indeed is presents an even trickier issue here. Regardless of the final answer to this question, however, the claim that (bare, non PP) adverbs do not occur in AS-nominals and hence AS-nominals do not contain a VP cannot be sustained. As additional support we

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25 The adverb in (81c) is homophonous with the plural feminine adjectival form. The adverb in (81d) is homophonous with the singular feminine adjectival form. In actuality, however, they have neither the distribution nor the properties of adjectives in any domain within the language. Historically, both suffixes are arguably traceable back to an accusative-like marking found historically as well as currently on adverbs in some Semitic languages (cf. Classical and Modern Standard Arabic). Both strategies of adverb formation are only marginally productive in Modern Hebrew, but some forms do commonly occur, including those used here. I am grateful to Yehuda Falk (p.c.) for pointing out these specific forms to me in this relevant context.

26 Specifically, although the restriction on light adverbs holds in AS-nominals and in gerunds, as well as in clausal cases such as those in (i) (albeit not with a similar force), the post-VP adverbs in the non-inverted cases in (ii) are licit following a complement, as they are in the inverted cases in (iii). In the latter case, however, the adverbs do require a somewhat stronger stress, suggesting that their relative grammaticality in that position is to be attributed to focus effects:

(i) a. ??ha.boqer baxar Dan maher ’et ha.orxim
   this.morning selected Dan quickly om the.guests
   b. ha.boqer baxar Dan maher maher/’be-mehirut ’et ha.orxim
      this.morning selected Dan quickly quickly/in-quickness om the.guests

(ii) a. Dan baxar ’et ha.orxim maher/maher maher/’be-mehirut
    Dan selected om the.guests quickly/quickly quickly/in-quickness
   b. Dan baxar maher/maher maher/’be-mehirut ’et ha.orxim
      Dan selected quickly/quickly quickly/in-quickness om the.guests

(iii) a. (?)ha.boqer baxar Dan ’et ha.orxim maher
    this.morning selected Dan om the.guests quickly
   b. ha.boqer baxar Dan ’et ha.orxim maher maher/’be-mehirut
      this.morning selected Dan om the.guests quickly quickly/in-quickness
note that in gerunds, in Hazout’s (1992) sense, similar effects hold, and presumably for similar reasons, although it is undisputable that a VP is present in these cases:

(82) a. axarey ekol Dan et ha.tapuax
         after eating Dan om the.apple
       be-mehirut /le’aṭ le’aṭ /xapuzot /*maher /*le’aṭ
       in-quickness /slowly slowly /quickly /*quickly /*slowly
b. axarey ekol Dan be-mehirut /le’aṭ le’aṭ /xapuzot/*maher /*le’aṭ
         after eating Dan in-quickness/slowly slowly/quickly /*quickly/*slowly
       ‘et ha.tapuax
       om the.apple

3.5.2 Aspectual and evidential adverbs

Regardless of their prosodic properties, not all adverbial expressions are licit in AS-
nominals. Evidential adverbs such as davqa ‘willfully’, be-hexleţ ‘definitely’ (lit. ‘in-decision’), or k-a.nir’e ‘apparently, possibly’ (lit. ‘as-apparent’) are impossible, as are adverbial expressions such as tamid ‘always’ or be-derek klal ‘usually’ (lit. ‘by way of rule’), the latter two presumably related to grammatical aspect (g-asp). Note that the list of barred adverbs consists of both PP and bare adverbs, and hence the restriction cannot possibly be related to constituent structure as such. The standard clausal VP picture is in (83)–(84). Note, specifically, that (with the exception of k-a.nir’e ‘probably’) evidential adverbial expressions in clausal VPs may not occur post-verbally, but that g-asp adverbials may occur both pre-verbally and post-verbally, but not at the right periphery of the VP:

(83) a. Ran davqa/be-hexleţ/k-a.nir’e biššel ‘et ha.cli
     Ran willfully/definitely/probably cooked om the.roast
b. Ran biššel *davqa/*be-hexleţ/k-a.nir’e ‘et ha.cli
   Ran cooked *willfully/*definitely/probably om the.roast
c. *Ran biššel ‘et ha.cli davqa/be-hexleţ/k-a.nir’e
    Ran cooked om the.roast willfully/definitely/probably

(84) a. Ran tamid/be-derek klal mebaššel ‘et ha.cli
     Ran always/usually cooks om the.roast
b. Ran mebaššel tamid/be-derek klal ‘et ha.cli
    Ran cooks always/usually om the.roast
c. *Ran mebaššel ‘et ha.cli tamid/be-derek klal
    Ran cooks om the.roast always/usually

Finally, manner adverbs may occur either to the left or to the right of the direct object, but never pre-verbally:

(85) a. *Ran be-haclaxa/le’aṭ biššel ‘et ha.cli
     Ran successfully/slowly cooked om the.roast
b. Ran biššel be-hacla xa/le’at ’et ha.cl i
Ran cooked successfully/slowly om the.roast

c. Ran biššel ’et ha.cl i be-hacla xa/le’at
Ran cooked om the.roast successfully/slowly

An investigation of the placement of adverbs in Hebrew is clearly outside the scope of this work (but see Shlonsky 1997 as well as Borer 1995 for some comments). What does appear clear on the basis of the picture in (83)–(84), however, is that evidential adverbs are licensed quite high in the tree—they are clear cases of S-adverbs in the sense of Jackendoff (1977), and are very straightforwardly licensed by some functional structure otherwise implicated in the emergence of propositions. Whatever position that turns out to be, it is clearly too high for any V-movement to land in a head to their left. G-ASP adverbs, equally clearly, merge somewhat lower, presumably licensed by some ExP-segment associated with G-ASP. Their optional position, relative to the verb, in turn emerges as a result of a degree of optionality of Hebrew verb movement, independently argued for in Borer (1995). Very schematically, then, the emerging picture is as in (86):

(86) \[ \langle_{C/T \text{(proposition)}} \text{EVIDENTIAL ADV (V)} \mid \langle_{\text{"AGENTIVE" ADV (V)}} \mid \langle_{\text{G-ASP G-ASP ADV (V)}} \mid \langle_{\text{MANNER ADV V)}} \rangle \rangle \]

Returning now to AS-nominals and as already noted, both evidential and G-ASP adverbs are across-the-board impossible, in both Short and Long versions:

(87) a. *ha.biššul šel Dan davqa/be-hexleť/k-a.nir’e ’et ha.cl i
the.cooking of Dan willfully/de fi ni tely/probably om the.roast

---

27 English gerunds, note, exclude evidential adverbs but allow G-ASP ones:

(i) Mary’s eating pasta often
Bill always talking to the neighbor

(ii) *Mary’s presumably eating pasta
*Bill evidently talking to the neighbor

Hebrew gerunds (in Hazout’s 1991, 1992 sense), on the other hand, exclude both evidential and G-ASP adverbs:

(iii) *†im ktob Dan tamid/be-derek klal ’et ha.miktab
with writing Dan always/usually om the.letter

(iv) *†im ktob Dan ’et ha.miktab tamid/be-derek klal
with writing Dan om the.letter always/usually

The different distribution of adverbs in English gerunds and the constructions in (iii–iv) in turn suggests that while the cases of (iii–iv) should clearly be distinguished from AS-nominals, they are nonetheless not equivalent, structurally, to English gerunds.
b. *ha.biššul šel Dan ‘et ha-cli davqa/be-hexlet/k-a.nir’e the.cooking of Dan om the.roast willfully/definitely/probably

c. *ha.biššul davqa/be-hexlet/k-a.nir’e šel Dan ‘et ha-cli the.cooking willfully/definitely/probably of Dan om the.roast

(88) a. *ha.biššul šel ha-cli davqa/be-hexlet/k-a.nir’e the.cooking of the.roast willfully/definitely/probably

b. *ha.biššul davqa/be-hexlet/k-a.nir’e šel ha-cli the.cooking willfully/definitely/probably of the.roast

(89) a. *ha.biššul šel Dan tamid/be-derek klal ‘et ha-cli the.cooking of Dan always/usually om the.roast

b. *ha.biššul šel Dan ‘et ha-cli tamid/be-derek klal the.cooking of Dan om the roast always/usually

c. *ha.biššul tamid/be-derek klal šel Dan ‘et ha-cli the.cooking always/usually of Dan om the.roast

(90) a. *ha.biššul šel ha-cli tamid/be-derek klal the.cooking of the.roast always/usually

b. *ha.biššul tamid/be-derek klal šel ha-cli the.cooking always/usually of the.roast

The conclusion from the contrast between (83)–(84) on the one hand, and (87)–(90) on the other, is rather self-evident. Although event structure is present in AS-nominals, thereby licensing manner adverbs and Originator-oriented (“agentive”) adverbs, neither g-asp nor any propositional node (T or C) is. It is precisely the absence of the ExP-segments that license propositions and g-asp that bars adverbs that modify them from merging in AS-nominals.

A particularly clear illustration of the workings of the structural difference comes from the adverb le’aṭ le’aṭ (lit. ‘slowly slowly’). As it turns out, and depending on its structural placement, it can either mean an intensified form of ‘slowly’, i.e. ‘very slowly’, or alternatively, ‘gradually’ or on a par with English ‘little by little’. Preverbally, the only possible reading is that of ‘little by little’. In the right periphery, in turn, the only possible reading is ‘very slowly’. And finally, post-verbally but preceding the complement it is ambiguous:

(91) a. ha.memšala le’aṭ le’aṭ harsa ‘et medinat ha.sa?ad. the.government little by little destroyed om the welfare state ‘The government little by little destroyed the welfare state.’

b. ha.memšala harsa le’aṭ le’aṭ ‘et medinat ha.sa?ad. the.government destroyed little by little/very slowly om the welfare state ‘The government little by little/very slowly destroyed the welfare state.’

c. ha.memšala harsa ‘et medinat ha.sa?ad le’aṭ le’aṭ. the.government destroyed om the welfare state very slowly ‘The government destroyed the welfare state very slowly.’
As is indeed anticipated, in AS-nominals the only possible reading is that of ‘very slowly’, with the gradual ‘little by little’ reading excluded:\(^\text{28}\)

\[
\begin{align*}
\text{(92) a. } & \text{ha.harisa} \quad \text{šel ha.memšala} \quad \text{le’at le’at} \\
& \text{the.destruction of the.government} \quad ??????????? \text{very slowly/*little by little} \\
& \text{‘et medinat ha.sa?ad} \quad \text{om the.welfare.state}
\end{align*}
\]

\[
\begin{align*}
\text{b. } & \text{harisat} \quad \text{ha.memšala} \quad \text{le’at le’at} \\
& \text{the.destruction of the.government} \quad \text{very slowly/*little by little} \\
& \text{‘et medinat ha.sa?ad} \quad \text{om the.welfare.state}
\end{align*}
\]

\[
\begin{align*}
\text{c. } & \text{ha.harisa} \quad \text{šel ha.memšala} \quad \text{‘et medinat ha.sa?ad} \\
& \text{the.destruction of the.government} \quad \text{om the.welfare.state} \\
& \text{le’at le’at} \quad \text{very slowly/*little by little}
\end{align*}
\]

\[
\begin{align*}
\text{d. } & \text{ha.harisa} \quad \text{šel medinat ha.sa?ad} \quad \text{le’at le’at} \\
& \text{the.destruction of the.welfare.state} \quad \text{very slowly}
\end{align*}
\]

It is worthwhile digressing briefly here to note what exactly it would mean for some (verbal) ExP-segments to be licit in propositional contexts, but barred, as we suggest, within AS-nominals. That T is missing in AS-nominals seems plausible enough. In fact, this absence presumably leads to a distinct way of evaluating the event within AS-nominals and within the domain of tense (note, specifically, that the formulation of truth conditions relative to such events within AS-nominals is not a trivial matter in the absence of tense).\(^\text{29}\) Insofar as a certain class of g-asp adverbial interpretations is missing as well, the most natural assumption would be that g-asp too is missing within AS-nominals (but not, note, within English gerunds, likewise missing tense).

In turn, I explicitly claimed that E is present in AS-nominals, although, by assumption, E merges both above T and above g-asp in propositional cases. Thus, clearly, the functional structure within AS-nominals cannot be architecturally incremental. We cannot assume that the structure may only be pruned off at the top, as the Cartographic approach would have it (cf. Belletti 2004; Cinque 2002; Rizzi 2004a, b). This claim is in fact already explicitly put forward in Borer (2005a, b), where I propose that merger of any functional head is optional, but the choice of which head to merge has semantic consequences, some possibly leading to uninterpretability. To exemplify, the merger of CL, by assumption below both quantity and DP, is optional, and its absence leads to mass, rather than count interpretation. The failure of ASP\(_Q\) to merge, likewise results in a specific event interpretation, i.e. lack of quantity events, although ASP\(_Q\) by assumption merges below both T and E, and probably below g-asp as well. From that perspective, then, the failure of T and g-asp to merge within AS-nominals cannot be excluded, in and of itself, quite regardless of the fact that E, by assumption, merges above both in the clausal

\(^{28}\) The placement of an adverb here between the subject and the complement, as in (92a), is disfavored, but is perfectly licit in the construct variety in (92b). The effect does not generalize (see (130)). A full explanation for this effect is not attempted.

\(^{29}\) But see van Hout and Roeper (1998) for the claim that tense does merge within AS-nominals.
structures assumed here (cf. Chapter 2, section 3). Rather, their failure to merge is expected, and correctly so, to lead to interpretational consequences, at least some of these clearly attested through the distribution of adverbs.

3.6 Hebrew AS-nominals: Tentative Summary

We conclude that evidence for a verbal Extended Projection within AS-nominals in Hebrew is rather overwhelming. Markers otherwise unique to verbal contexts such as the object marker ‘et, the preposition ‘al yedey, and adverbs join with evidence concerning word order and constituent structure to indicate that an explanatory theory of the syntax of AS-nominals in Hebrew requires the projection of such an internal structure. Nevertheless, we did uncover at least two differences in Hebrew between the verbal domain in clauses and the verbal domain embedded within AS-nominals. Both of these differences concern the variety referred to as a Short AS-nominal, which allows the logical subject to be omitted or expressed as a by-phrase, Hebrew’s ‘al yedey. These relevant contrasts are repeated here as (93)–(96). The open issues which concern their properties are listed in (97):

(93) ha.hokaxa šel ha.ṭe?ana (be-haclaxa) (be xodšayim)
the.proof of the.theorem (successfully) (in two months)

(94) a. ha.ṭippul b-a.ba?aya (?al yedey ha.šišonot) kedey le.habi
the.treatment in-the.problem (by the.authorities) in order to bring
le-pitaron mahir
to-solution quick
b. *ha.ṭippul šel ha.ba?aya (?al yedey ha.šišonot)
the.treatment in-the.problem (by the.authorities)
(95) *hokixa ‘et ha.ṭa?ana (be-haclaxa) (be xodšayim)
proved om the.theorem (successfully) (in two months)

(96) a. *ṭuppal ba-ba?aya ?al yedey ha.memšala
treated.pass in-the.problem by the.government
b. ha.ba?aya ṭuppla ?al yedey ha.memšala
the.problem treated.pass by the.government

(97) a. Why are subjects optional in AS-nominals, as illustrated by (93)? Subjects are not normally optional in clausal contexts (cf. 95). (Hebrew does not have pro-drop in 3rd person contexts).

b. At least relative to the contrasts between (94) and (96), it seems that (94a) cannot be passive, or at least, not the same passive as that which is attested in clauses. But if (94a) is not passive, what is the source of ‘al yedey in the AS-nominal, and can we continue to claim that it is the very same ‘al yedey as that occurring in passivized clauses?
I do return to the resolution of these issues in Chapter 5, setting them aside for the remainder of this chapter, and turning, instead, to some evidence in English for the presence of VP and AP constituents within de-verbal and de-adjectival AS-nominals.

### 3.7 Evidence for a VP in English de-verbal AS-nominals

#### 3.7.1 Preliminaries

In exhibiting clear properties of an embedded VP, Hebrew de-verbal AS-nominals are by no means unique. Similar properties have been observed and similar conclusions reached at the very least by Rozwadowska for AS-nominals in Polish (1997), by Alexiadou for AS-nominals in Greek (2009), and by Valois (1991) for French. With somewhat different diagnostics, but nonetheless strong evidence for a VP, similar claims have been made regarding Chinese (Fu 1994), Japanese (Takahashi 2000), and Korean (Park 2008). An obvious conclusion, then, is that UG does allow the embedding of a verbalizing functional event complex under N.

Given this conclusion, we are now faced with a question concerning language variation. There are clear similarities between the behavior of AS-nominals in languages which have direct evidence for VPs, and the behavior of AS-nominals in English. These similarities cover, but are not limited to, the original diagnostics proposed by Grimshaw (1990) for complex event nominals. Thus in English AS-nominals, argument structure is projected exactly as it is within clauses, and the (presumed) verbalizing of roots within AS-nominals furthermore follows the very same route it follows in clauses. Given these similarities, do we nonetheless wish to claim that it is possible for argument structure and event interpretation to emerge with completely distinct structures in two different grammars? What is at stake here is not a language-specific choice to project or not to project a particular functional feature as a separate category, nor does it concern language specific linearization conventions. Rather, the variation here would involve the possibility that in Hebrew and Polish (i.a.), event structure, complete with arguments, across the board verbalizes its complement domain (=renders it V-equivalent), while in English it only does so in clauses and in gerunds, but not necessarily in nominals, thereby, by assumption, allowing event structure in English, but not in Hebrew, to merge above N.

By Occam’s Razor, a theory which opts for unified categorial properties for argument structure and event interpretation across the board, in all languages, is preferable, if workable. If the arguments for the existence of a verbal Extended Projection in de-verbal AS-nominals in Hebrew and other languages are sufficiently compelling, then it is clear that at least in these languages, the event complex can never directly dominate an N. It therefore follows that a unified theory must postulate a verbal Extended Projection in English de-verbal AS-nominals as well. Similar logic applies, of course, to de-adjectival AS-nominals, where the presence of an adjectival Extended Projection would likewise be required. We must return to these English structures, then, and consider the extent to which some evidence can be found that they do include a V-equivalent or A-equivalent constituent. Some such evidence is directly discussed in Fu, Roeper, and Borer (2001), and involves the
distribution of the VP anaphor \textit{do so} and the distribution of adverbs. I now turn to summarizing this evidence as well as to augmenting it.\textsuperscript{30}

3.7.2 The VP anaphor \textit{do so} in English AS-nominals

That \textit{do so} is, indeed, a VP, or, for that matter, some portion of a verbal Extended Projection which perforce includes a VP, has been independently argued by Hanka-mer and Sag (1976). That the constituent in question must be bigger than the verbal terminal and may include adjuncts, is shown by the examples in (98):

\begin{enumerate}
\item a. He removed the garbage yesterday and I \textit{did so} too.
\item b. He removed the garbage yesterday and I \textit{did so} today.
\item c. \textit{*He moved} the green container and I \textit{did so} the black container.
\end{enumerate}

Gerunds, in this respect, pattern exactly the same as sentences, allowing \textit{do so} anaphors with identical constraints:

\begin{enumerate}
\item a. His removing the garbage yesterday was followed by my \textit{doing so}.
\item b. His removing the garbage yesterday was followed by my \textit{doing so} today.
\item c. \textit{*his moving} the green container and my \textit{doing so} the black container
\end{enumerate}

Supposing the structure proposed in this work, and specifically, the assumption that the direct objects merge in event-related functional specifiers, it follows that in the presence of a direct object, the \textit{do so} anaphor must include at the very least ASP\textsubscript{Q} or F\textsubscript{SHL}, together with V\textsuperscript{max}. Given our assumption that either ASP\textsubscript{Q} or a F\textsubscript{SHL} could be present inside AS-nominals, it follows that at least in principle, the ASP\textsubscript{Q} or a F\textsubscript{SHL} within AS-nominals could license \textit{do so} anaphors, thus paralleling the situation for gerunds in (99). That they can, in fact, license such an occurrence of \textit{do so} was first pointed out by Kehler and Ward (1995) based on corpora cases:

\begin{enumerate}
\item a. The \textit{defection} of the seven moderates, who knew they were incurring the wrath of many colleagues in \textit{doing so}, signaled that it may be harder to sell the GOP message on the crime bill than it was on the stimulus package.
\begin{flushright} (Washington Post) \end{flushright}
\item b. Even though an Israeli \textit{response} is justified, I don’t think it was in their best interests to \textit{do so} right now.
\begin{flushright} (token provided by Dan Hardt, in Kehler and Ward 1995) \end{flushright}
\end{enumerate}

\textsuperscript{30} Facts in Fu, Roeper, and Borer (2001), including some previously published by other authors and based on corpus data, have come under considerable criticism. The present author, unfortunately, is not in a position to assert that they represent her judgments. In the years since the publication of Fu et al. (2001), however, I have certainly come across a significant number of people—although in likelihood a minority of English native speakers—who do accept the judgments in that article as reported. It goes without saying that those who reviewed the article on behalf of the editors of NLLT as well as the editors themselves accepted these judgments as reported as well. Even more, a majority in fact, accept the contrasts highlighted as such in the text between manner adverbs and evidential or g-ASP adverbs. At the very minimum, then, the facts here summarized characterize a minority dialect, as well as contrastive judgments of all speakers, and are hence valid as an argument for those speakers’ grammar of AS-nominals. For more relevant comments, see text discussion.
A few additional corpora cases are in (101) (note that in (101b) doing so refers to resignation, and not to turn in):

(101)  a. His firm’s acceptance of my company’s offer to buy these remaining lots was strictly conditional on my doing so. <http://www.bagwellcompany.com/031510kramer.html>

b. When you turn in your resignation keep in mind why you are doing so – it’s to take an opportunity with a new company that’s better (for whatever reason) than the one you have right now. <http://www.onlinecareerinfo.com/category/resignation-information>

One of the more interesting aspects of the occurrences of do so in (100)–(101) is that they clearly are not, themselves, AS-nominals. Thus in (100a) and (101a) the do so is a gerund (under the plausible assumption that so is a pronominal and is in need of objective case), and of particular note are (100b), where the do so anaphor is an infinitive, and (101b), where it is a progressive. Under any constrained theory of anaphoric relations, it is hard to see how a constituent that is itself clearly a VP or part of a verbal Extended Projection, such as having done so, be doing so, or to do so could be licensed by a constituent which is of a different category. Thus an analysis of AS-nominals which does not postulate verbal structure of some sort would not only have to argue that do so is not a VP anaphor (but, say, an event anaphor, cf. Kehler and Ward 1995), but also, being itself clearly a VP (or some part of the verbal Extended Projection), do so can nevertheless take as its antecedent a nominal phrase. And yet, the only case in which a do so anaphor can be licensed by an apparently non-verbal antecedent is within specifically de-verbal AS-nominals.31

The argument for a VP in English AS-nominals is not complete, of course, unless we demonstrate that R-nominals, including simple event nominals, cannot co-occur with do so. This is illustrated by (102) (and note that all R-nominals here have a simple event interpretation):

(102)  a. *His wedding in the spring and my doing so in the fall surprised no one.

b. *His lecture to the participants before the party and my doing so afterwards are not coincidence.

c. *Even though a presidential trip is essential, I don’t think he will do so.

d. *My exam in the morning and John’s doing so in the afternoon definitely helped.

And finally, consider the following clear and universally accepted contrasts between do so and the plain do, with regard to their potential licensing from within AS-nominals:

(103)  a. (?)The Air Force’s bombing of the city with missiles and the Navy’s doing so {with rockets/too} made the headlines.

31 The reader is referred to Kehler and Ward (1995) for discussion of the event anaphor perspective. See Fu et al. (2001) for counter-arguments.
b. *The Air Force’s bombing of the city with missiles and the Navy’s doing too made the headlines.

What is the difference between do so, or doing so, and a plain do, or doing? Déchaine (1993b) convincingly argues that anaphoric do is a T(ense) anaphor while do so is a lower constituent which does not include T. These distinct positions for do and do so can be illustrated by their respective positions relative to negation. While do so occurs below negation, plain do occurs above it:

(104)  
\begin{enumerate}
\item a. He said he would change his socks, but he \[T \text{ did } \] not do so.
\item b. *He said he would change his socks, but he \[T \text{ did } \] not so.
\end{enumerate}

(105)  
\begin{enumerate}
\item a. He said he would change his socks, but he \[T \text{ did } \] not.
\item b. *He said he would change his socks, but he \[T \text{ did } \] not do.
\end{enumerate}

Given that do is dominated by T but not so do so, the impossibility of having the verbal structure within AS-nominals antecede do follows immediately if we maintain that the domain of AS-nominals is exclusive of Tense, a position that was already advocated for Hebrew in section 3.5.2, and is equally valid for English, as we shall see shortly. In turn, the drastic improvement of the licensing of do so serves to argue that whatever structure licenses it, it is present in AS-nominals. Were that not the case, note, the sharp contrast between these two cases would become inexplicable.

Digressing somewhat to consider the marginality, for many speakers, of the cases in (100)–(101) and similar (see fn. 30), it might be worthwhile noting that the fact that they are acceptable to any speakers, let alone spontaneously coined, is in fact quite surprising. All the more so given the fact that quite independently of the presence of a verbal Extended Projection within AS-nominals, many grammatical factors could conspire to rule them out or make them marginal. Thus note that by assumption, do so, when licit, would be licensed by an antecedent that is embedded within a DP, and even more strikingly, by what is either a silent copy or a discontinuous constituent. Those relevant possible antecedents are circled in (106) (irrelevant details omitted; see (17b) for the relevant structure, albeit in Hebrew; see Chapter 4 for a fuller discussion of the English structure):

ExS-N: a nominal ExP-Segment
Nor can either one of these constituents serve as an appropriate antecedent for the specific grammatical placement of so, by assumption accusative-marked, given the absence of accusative marking within AS-nominals in English. And finally, note, doing of so is straightforwardly illicit with the same function, already a puzzle if, indeed, event structure may be directly associated with N.

It thus emerges that insofar as cases such as those in (100)–(101) are marginal for many speakers, this is hardly surprising, nor does it provide evidence, as such, for the absence of a verbal projection in AS-nominals. What is surprising, however, is that they are licit for some speakers. Thus, ipso facto, and in face of what seem like overwhelming independent structural reasons to disfavor them, the fact that for some speakers they are nonetheless licit is strong evidence for the presence of a verbal projection within AS-nominals.

3.7.3 Adverbs in English AS-nominals

Despite the marginality for many speakers of any adverbs within AS-nominals (as compared, e.g., with adjectives with a similar meaning), a more fine-tuned investigation of the distribution of adverbs uncovers contrasts which are structurally revealing. Specifically, two distinctions must be drawn concerning the distribution of adverbs in AS-nominals. The first concerns the relative grammaticality of so-called VP-adverbs—primarily manner and Originator-oriented—within AS-nominals vs. their complete ungrammaticality in R-nominals, including simple events. The second concerns the difference between the relative grammaticality of VP-adverbs within AS-nominals vs. the complete ungrammaticality of sentential adverbs, primarily evidential and grammatical-aspect related. Thus consider the following contrasts:

(107) a. ?While the destruction of the evidence intentionally may lead to persecution, this is not the case for the destruction of the evidence accidentally.
b. ?The disassembling of this antique furniture successfully will require many hours of work, but its potential renovation is dependent on it.
c. ?The interpretation of this paragraph contextually may finally shed some light on its more obscure references.
d. ?Even though it was expected, I was nonetheless shocked by Jane’s resignation from the bank so quickly.
e. ?The collaboration of the witnesses with the court voluntarily is sure to speed up the procedure.

Awkward as (107a–e) might be for some, all speakers nevertheless find a clear, sharp contrast between these and the occurrence of adverbs in underived nouns or in derived R-nominals, even if those refer to (simple) events. Thus compare the distribution of adverbs in AS-nominals in (107a–e) with the occurrence of adverbs in the simple event nominals in (108):

(108) a. *the race to the mountains deliberately
b. *his trip to Hawaii secretly
c. *the lecture about the rugs competently
d. *Sarah’s wedding to Tom happily
The cases in (107a–e) further contrast with the very same derived nominals when occurring as R-nominals rather than AS-nominals:

(109)  
   a. *While a/the destruction *intentionally* may lead to persecution, this is not the case for a/the destruction *accidentally.*
   b. *This kind of disassembling *successfully* is essential.*
   c. *The/An interpretation *contextually* may finally shed some light on the issue.
   d. *The/A collaboration *voluntarily* is bound to reduce your sentence.

The facts in (107)–(109) thus show that an across-the-board exclusion of adverbs in nominal expressions is too coarse-grained. While they are certainly awkward within AS-nominals, in other nominals, including the very same derived forms but as R-nominals, and with simple events, they are sharply ungrammatical. Although a fuller explanation for the relative awkwardness of the adverbs in (107) is certainly called for, it remains the case that judgments, as they stand, require the structural differentiation between these cases and those in (108)–(109), the latter well beyond awkward and rather strictly ungrammatical.

Consider now the relative acceptability of (107a–e) when compared with the clear ungrammaticality of (110) with evidential adverbs, and (111) with g-asp ones, recalling the very similar effects already discussed for Hebrew in section 3.5.2.*

(110)  
   a. *The court presupposed [the destruction of the evidence presumably].
   b. *Sometime during the 19th century, irreparable damage was caused by [the disassembling of this antique piano probably].
   c. *[The discovery of this commentary fortunately] shed light on the interpretation.

(111)  
   a. *This company subscribes to [the investment of retirement funds always/usually].
   b. *Privatization resulted in [the dismantling of the welfare state gradually].

Recall now that in the context of very similar facts in Hebrew, I proposed the scheme in (86), hereby repeated (verb movement aside), as the general merger site for evidential, Originator-oriented, g-asp and manner adverbs:

(112) \[C/T \text{(proposition)} \text{EVIDENTIAL ADV } \text{AGENTIVE ADV } \text{T } \text{G-ASP G-ASP ADV } \text{MANNER ADV} \ldots\]

Insofar as I have suggested that functional event structure, including specifically ASP, and E are present in AS-nominals, the occurrence of both manner adverbs and Originator-oriented “agentive” adverbs is expected. Insofar as neither C and T (or potentially higher illocutionary-force inducing nodes) nor g-asp are present in

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32 See Chapter 4 for ING R-nominals, and for *this kind of contexts.*

33 *(In)frequently and possibly *often* as well pattern with manner, rather than g-asp. Similar effects hold in Hebrew with the same adverbs (*le-?itim qrobot ‘frequently’; le-?itim rexoqot ‘rarely’):* 

(i)  
   a. *?The clearing of the filing cabinet (in)frequently tends to result in the misplacing of files.*
   b. *?His explanation of the proof (so) *often* contributed to a better grasp of the problem.*

34 See Chapter 4 for ING R-nominals, and for *this kind of contexts.*

35 *(In)frequently and possibly *often* as well pattern with manner, rather than g-asp. Similar effects hold in Hebrew with the same adverbs (*le-?itim qrobot ‘frequently’; le-?itim rexoqot ‘rarely’):* 

(i)  
   a. *?The clearing of the filing cabinet (in)frequently tends to result in the misplacing of files.*
   b. *?His explanation of the proof (so) *often* contributed to a better grasp of the problem.*
AS-nominals, the absence of both \textit{g-asp} adverbs and evidential adverbs is directly expected. And finally, and following a similar logic to that previously pursued, if one were to argue that across-the-board adverbs are excluded in all nominals, these contrasts would become obscured, and along with them the important light that they shed on the internal structure of AS-nominals.

The table in (113) summarizes the distribution of adverbs in nominals. Gerunds are included, insofar as they do license \textit{g-asp} adverbs, but exclude, as is to be expected, evidentials, and thereby occupy a slot between AS-nominals and full propositions:\footnote{Gerunds:}

\begin{table}[h]
\centering
\begin{tabular}{llll}
\hline
 & \textbf{R-nominals} & \textbf{AS-nominals} & \textbf{Gerunds} & \textbf{C/T-propositions} \\
\hline
\textbf{event adverbs} & no & yes & yes & yes \\
\textbf{\hspace{1cm} (EVENT, MANNER, Originator-ORIENTED)} & & & & \\
\textbf{g-asp adverbs} & no & no & yes & yes \\
\textbf{\hspace{1cm} (EVIDENTIALS)} & no & no & no & yes \\
\hline
\end{tabular}
\end{table}

3.7.4 Adjectives vs. adverbs in AS-nominals

Importantly, the actual content expressed by the adverbs in (110)–(111) is not barred in AS-nominals. On the contrary, it is (with few exceptions) available, providing it is expressed as an adjective, rather than an adverb. In turn, the full array of manner and Originator-oriented adverbs can be expressed as adjectives, rather than adverbs, as well:

\begin{enumerate}
\item a. The court presupposed the \textit{presumed} destruction of the evidence.
  
\item b. Sometime during the 19th century, irreparable damage was caused by the \textit{probable} disassembling of this antique piano.
  
\item c. The \textit{fortunate} discovery of this commentary may shed light on the interpretation.
\end{enumerate}

(115) Privatization resulted in the \textit{gradual} dismantling of the welfare state.

\begin{enumerate}
\item a. Kim’s \textit{secret} confession of her crime to the police
  
\item b. Jane’s \textit{occasional} concessions to Bill
  
\item c. Yaffa’s \textit{deliberate} abandonment of her hillside home
  
\item d. Dennis’s \textit{incompetent/slow} treatment of the problem
\end{enumerate}

\footnote{Gerunds:}

(i) a. *The court presupposed \{\textit{presumably} destroying the evidence \textit{presumably}\}.
  
\item b. *Sometime during the 19th century, irreparable damage was caused by \{(someone’s) \textit{probably} disassembling this antique piano \textit{probably}\}.
  
\item c. *\{(Mary’s) \textit{fortunately} discovering this evidence \textit{fortunately}\} shed light on the interpretation.

(ii) a. This company subscribes to \{(banks) \textit{always/usually} investing retirement funds\}.
  
\item b. Privatization resulted in \{\{(the state’s) \textit{gradually} dismantling of the welfare state\}.}
But as it turns out, and with the exception of some Originator-oriented adjectives, these same adjectives occur with simple events as well:

(117) a. John’s fortunate trip to the mountains
b. her presumed lecture on biology
c. Kim’s probable crime

(118) a. John’s occasional class in physics
b. Mary’s secret wedding
c. Kim’s unbiased version of the events
d. the defendant’s incompetent crime

As it turns out, this situation presents an additional problem for claims, however executed, that nouns may be associated directly with event structure, be they lexicalist, as in Grimshaw (1990), or syntactic, as in Ouhalla (1991), Picallo (1991), or Alexiadou (2001). Specifically, in none of these accounts could it be hypothesized that the properties of the event within the AS-nominals are such that they make modification by, e.g., probably semantically impossible, as probable, with the very same illocutionary force, is available. Nor is it particularly plausible to assume that a semantic (rather than syntactic) partition of some sort blocks some modifiers but not others from being adverbial, but only within AS-nominals (e.g. *presumably and *gradually but licit quickly and intentionally). Rather, what emerges is that events, whether simple or complex, may be semantically modified by evidentials or illocutionary-force inducing expressions, as well as by expressions of manner and frequency. But this only stresses the remaining puzzle—if that is indeed the case, then the occurrence of (some) adverbs exclusively in AS-nominals but not in simple event nominals cannot be semantically accounted for, nor can the exclusion of some adverbs but not others. Rather, this points towards a syntactic account. The reason some adverbs are licit in AS-nominals, but not in simple event nominals, is that the former contain verbal structure. The reason some adverbs are licit within AS-nominals but others are not is that the structure required to render these modifiers licit specifically as adverbs is missing. Denying the presence of a verbal constituent within AS-nominals makes any account of these mismatches between interpretation and categorial instantiation impossible to explain.

Finally, note the intriguing interaction between modification and do so in (119), brought to my attention by K. McKinney-Bock (p.c):

(119) a. Mary’s competent filing of the forms yesterday and John’s doing so today (=John’s doing so competently)
b. Mary’s deliberate concealment of the evidence in the bedroom and John’s doing so in the warehouse (=John’s doing so deliberately)

Recall now that the doing so anaphor, when anteceded by an AS-nominal, cannot, in itself, be a nominal, and rather must be a gerund, an infinitive, or a progressive participle. As such, it cannot be modified by an adjective, as is confirmed by the ungrammaticality of (120a–b). Rather, as is expected, the doing so expression may only be modified by adverbs, as in the grammatical (121a–b) cases:
Embedding Syntactic Events within Nominals

(120) a. *Mary’s competent filing of the evidence yesterday and John’s incompetent doing so today
b. *Mary’s deliberate concealment of the evidence in the bedroom and John’s unintentional doing so in the warehouse

(121) a. Mary’s competent filing of the forms yesterday and John incompetently doing so today
b. Mary’s successful concealment of the evidence in the bedroom and John’s doing so unsuccessfully in the warehouse

When we now consider again the grammaticality of (119), an interesting paradox emerges. Doing so in (119) clearly refers back not only to the filing or concealment event, but also to the adjective modifying these events—competent and deliberate. In other words, the adjectives occurring within the AS-nominals are construed as modifying the gerund doing so, although any overt modification of doing so with an adjective rather than an adverb would lead to ungrammaticality.

A complete analysis of the emergence of such effects is outside the scope of this investigation and must await future research. At least at first glance, however, the facts suggest that the occurrence of adjectival or adverbial modifiers, as attested in AS-nominals or in the do so expressions licensed by them, is considerably more fluid than one would imagine, and that, specifically, the spelling out of an event modifier as an adverb or as an adjective may very well be a superficial adjustment process sensitive to its final merger site, and not to the syntactic properties of the constituent that it actually modifies. Specifically, insofar as the surface adjective deliberate appears to license the ellipsis of a covert adverb deliberately modifying doing so, it suggests that the adjective deliberate itself has been raised from a predicate internal position, and its occurrence as an adjective, rather than an adverb, is due to that. Very schematically, the structure is as in (122). Needless to say, insofar as the modifier deliberate functions as a VP modifier and licenses the ellipsis of VP modifiers, its occurrence strongly argues for the presence of such a VP:

(122) a. [N/D N [E Subj [ES modifier [ASPq Obj. [v
b. [modifier [N/D N [E Subj. [ES modifier [ASPq Obj. [v

More specifically, we note that the schematic structures in (122) give us at least some insight into how to characterize the distinction between the distribution of event modifiers within AS-nominals in a language such as Hebrew and in a language such as English. If, for a significant number of English speakers, the re-merger of the modifier with (some projection of) N is forced for independent reasons, the option in (122a) would be strongly disfavored or excluded. I leave this
intriguing matter, as well as the nature of the potential variation that is at its core, to future research.\footnote{Note that evidentials are quite independently excluded from the domain of VP ellipsis in sentences (cf. i). Scopal effects from the evidential are thus not expected in (ii) quite regardless of the original merger site of the evidential:}

\subsection*{3.7.5 Adverb placement—some structural considerations and questions to pursue}

Having concluded that adverbs are possible in Hebrew AS-nominals as well as in English AS-nominals for at least some speakers, let us consider briefly what the specific merger position of such adverbs may teach us about the internal structure of AS-nominals. We note, specifically, that in both English and Hebrew, an adverb cannot intervene between N and an of/šel DP. English, alongside an of DP with a direct object construal, also allows for a subject construal of of DPs for cases where a direct object is missing. Hebrew, on the other hand, allows šel DP for all subjects, as well as for objects, but the latter, as in English, only when the subject is missing. Across all of these cases, in English as well as in Hebrew, an adverb may not occur preceding such an of/šel DP:

(123) \textit{English, subject of-phrases:}

\begin{itemize}
\item a. *The laughing involuntarily of children at the disabled is unfortunate.
\item b. *The disappearance (so) abruptly of the rabbit was quite unnerving.
\end{itemize}

(124) \textit{English, object of-phrases:}

\begin{itemize}
\item a. *Mary’s breaking involuntarily/abruptly of the vase
\item b. *the breaking involuntarily/abruptly of the vase by Mary
\end{itemize}

(125) \textit{Hebrew, subject šel-phrases, transitive:}

\begin{itemize}
\item a. ha.hapgaza (*be-kavana) šel ha.’oyeb ‘et ha.?ir
  the.bombing ( on-purpose) of the.enemy in the.city
\item b. ha.’apiya (*be-haclaxa) šel Karmela ‘et ha.?uga
  the.baking ( successfully) of Karmela in the.cake
\end{itemize}

(126) \textit{Hebrew, subject šel-phrases, intransitive:}

\begin{itemize}
\item a. ha.nepila (*bli-kavana) šel Rani
  the.falling ( without-purpose) of Rani
\item b. ha.\textit{knisa} (*be-mapti?a) šel ha.’arnab
  the.entrance ( surprisingly) of the.rabbit
\item c. ha.ţippul (*be-rašlanut) šel ha.rope b-a.yeled
  the.treatment ( negligently) of the.doctor in-the.boy
\end{itemize}
(127) Hebrew, object šel-phrases (short AS-nominal):
   a. *ha.hapgaza (be-kavana) šel ha.?ir
      the.bombing (on-purpose) of the.city
   b. *ha.'apiya (be-haclaxa) šel ha.?uga
      the.baking (successfully) of the.cake

Contrasting with (123)–(127), both languages allow those same adverbs in the right periphery. Both, further, allow adverbs between an of-subject (where licit) and a complement (in English, an indirect one exclusively):

(128) English, subject of-phrases:
   a. The laughing of children (involuntarily) at the disabled (involuntarily) is unfortunate.
   b. The disappearance of the rabbit (so) abruptly was quite unnerving.

(129) English, object of-phrases:
   a. Mary’s breaking of the vase involuntarily/abruptly
   b. the breaking of the vase (involuntarily/abruptly) by Mary (involuntarily/abruptly)

(130) Hebrew, subject šel-phrases, transitive:
   a. *ha.hapgaza šel ha.'oyeb (be-kavana) ‘et ha.?ir (be-kavana)
      the.bombing of the.enemy (on-purpose) om the.city (on-purpose)
   b. *ha.'apiya šel Karmela (be-haclaxa) ‘et ha.?uga (be-haclaxa)
      the.baking of Karmela (successfully) om the.cake (successfully)

(131) Hebrew, subject šel-phrases, intransitive:
   a. *ha.nepila šel Rani (bli-kavana)
      the.falling of Rani (unintentionally)
   b. *ha.knisa šel ha.'arnab (be-maptia?)
      the.entrance of the.rabbit (surprisingly)
   c. *ha.ţippul šel ha.rope (be-rašlanut) b-a.yeled (be-rašlanut)
      the.treatment of the.doctor (negligently) in-the.boy (negligently)

(132) Hebrew, object šel-phrases (short AS-nominals):
   a. *ha.hapgaza šel ha.?ir (be-kavana)
      the.bombing of the.city (on-purpose)
   b. *ha.'apiya šel ha.?uga (be-haclaxa)
      the.baking of the.cake (successfully)

We note that the distribution of adverbs, in the distinct languages, is extremely similar, with areas of differences converging around the possibility in Hebrew, but not in English, of transitive AS-nominals with a post-nominal subject, vs. the possibility in English, but not in Hebrew, of a pre-N subject. In turn, this suggests that across the board, of-phrases as well as šel-phrases are raised into the DP
functional domain, thereby forcing adverbs, if present, to occur to their right. That this is, indeed, the structure within AS-nominals was already suggested for Hebrew in section 3.1 (see (18)–(19) and related discussion), and was assumed without much discussion for English, e.g. in (106). I return to this matter in some detail in Chapter 4, in the context of a more detailed discussion of the structure of English AS-nominals.

3.8 Evidence for AP in English De-adjectival AS-nominals

Intriguing evidence for the presence of an adjectival projection together with its predicative properties and presumed event complex, comes from Roy (2009). Thus observe the following contrasts, valid in both English and French:

(133) a. *Cette voyelle est nasale.
   ‘This vowel is nasal.’
   b. une voyelle nasale
      a vowel nasal
      ‘a nasal vowel’
   c. la nasalité de cette voyelle
      the nasality of this vowel

(134) a. Cette cavité est nasale.
   ‘This cavity is nasal.’
   b. une cavité nasale
      a cavity nasal
      ‘a nasal cavity’
   c. *la nasalité de cette cavité
      ‘the nasality of this cavity’

(135) a. Cette chanson est populaire.
   ‘This song is popular.’
   b. une chanson populaire
      a song popular
      ‘a popular song’
   c. la popularité de cette chanson
      ‘the popularity of this song’

(136) a. *Cette tradition est populaire.
   ‘*This tradition is popular.’
   b. une tradition populaire
      a tradition popular
      ‘a popular tradition’
   c. *la popularité de cette tradition
      ‘the popularity of this tradition’
As Roy (2009) observes, the generalization is that whenever an adjective can occur as a predicate, it may also serve as a base for the formation of an adjectival AS-nominal. When an adjective is impossible as a predicate, so is the correlating adjectival AS-nominal. By extension, and building on previous work on the distribution of predicative and attributive adjectives, Roy points out that if it is true that predicative adjectives must be intersective, then it follows that adjectival AS-nominals may only be constructed on the basis of intersective adjectives. It follows, straightforwardly, that the AS-nominals in (134), (136), and (138) are illicit, because the adjectives from which they would have been derived are not licit as predicates. Similarly, the effects in (139) are directly predicted:

(139) a. an utter mistake *this mistake is utter *the utterness of this mistake
     b. an alleged criminal *this criminal is alleged *the allegedness of this criminal
     c. a former president *this president is former *the formerness of this president

In Borer (1990) I propose that the distribution of predicative adjectives cannot be reduced to intersectivity as such, although predicates certainly favor that reading. The correlation, rather, is that only adjectival readings that are consistent with degree modification are licit as predicates. Thus compare the following contrasts (and note that the intersectivity of e.g. wooden and expression is by no means straightforward, while that of wooden and wall is, and yet the former is licit as a predicate while the latter is not):

(140) a. a very wooden/stony expression
     b. his facial expression is wooden/stony
     c. a wooden/stony facial expression

(141) a. *a very wooden/stony wall
     b. *this wall is wooden/stony
     c. a wooden/stony wall

(142) a. a most touching/supportive response
     b. his response was touching/supportive
     c. a touching/supportive response

36 And see Chapter 5, section 3 for a fuller review of Roy’s system and the set of diagnostics she proposes for de-adjectival AS-nominals (S-nominals, in her system).
Importantly, we find that the availability of AS-nominals indeed correlates directly both with the presence of a predicative instantiation and with the availability of degree modification:

(144) a. the woodenness/stoniness of his expression
    b. *the woodenness/stoniness of this wall

(145) a. the supportiveness of his attitude
    b. *the supportiveness of the wall

And similarly, for the specific adjectives that Roy (2009) considers:

(146) a. a very abstract painting → the abstractness of this painting
    b. *a fairly abstract painter → *the abstractness of this painter

(147) a. a very nasal voice → the nasality of his voice
    b. *a very nasal cavity → *the nasality of his cavity

(148) a. a very popular song → the popularity of this song
    b. *a very popular tradition → *the popularity of this tradition

(149) a. *a very utter mistake
    b. *a very alleged criminal
    c. *a most former president

As is clear, the distinction here cannot be based on the actual semantics of the adjectives in isolation, given the fact that the adjectives themselves are often the very same ones (e.g. nasal, abstract). Rather, it seems, a predicative context requires a DegP (at the very minimum), and Content that is incompatible with degree modification is thus excluded or coerced as predicate. Suppose we proceed to assume, as seems reasonable at this point, that DegP is obligatory in predicates, but not necessarily in attributive contexts. Finally, and insofar as adjectives are presumably the possible C-cores of some (stative) event structure complex, we fully expect such event structure, with its adjectival C-core, to be possible under some instance of C_{n[A]}, in parallel to de-verbal AS-nominals.

Roy (2009) proposes that while attributive adjectives merge as the specifiers of some nominal ExP-segment, predicative adjectives merge with predication structure which contains, in addition to the A itself, a PRED phrase that licenses the subject. Translating her claim to event-based functional labeling of the type proposed here and augmenting the predicative A with a DegP, the emerging structure for predicative adjectives is as in (150a). Attributive adjectives, on the other hand, merge either as part of a DegP (150b) or possibly as cases of bare A or a partial adjectival Extended
Projection, as in (150c). In either case, they proceed to merge with some nominal ExP-segment (SP=StateP; a dedicated event node; range assignment not marked): 37

\[(150) \quad \text{a. } \left[ \text{State DP } \ll e \gg \text{ [Deg } \text{ VERYDEG } \ll e \gg [A ] ] \right] \quad \text{wall very blue} \quad \text{(The wall is very blue)}
\]

\[\begin{align*}
\text{b. } & \left[ \text{Exs-N } [\text{Deg } \text{VERYDEG } \ll e \gg [A ] ] \ll e \gg \text{Exs-N} [N ] ] \quad [\text{very blue wall (a very blue wall)}] \\
\text{b. } & \left[ \text{Exs-N } [A ] \ll e \gg \text{Exs-N} [N ] ] \quad [\text{very blue wall (a very blue wall)}] \\
& \text{alleged criminal wall}
\end{align*}\]

Finally, definitionally, AS-nominals are precisely those configurations in which a $C_{N[X]}$, a nominal C-functor however realized, scopes over an embedded event complex. For de-adjectival AS-nominals (Roy’s S-Nominals), such a $C_{N[X]}$, presumably $C_{N[A]}$, would need to scope over the predicate structure in (150a). It is precisely because that structure entails a DegP, that AS-nominals constructed of adjectival expressions that are incompatible with DegP are excluded. We note in this context that what emerges here, as expected, is not ungrammaticality as such, but the failure of certain implicatures to emerge. A very nasal cavity, as well as the nasality of his cavity are certainly grammatical. They fail, however, to refer to The Nasal Cavity precisely because nasal, in that description, cannot be gradable. They are perfectly licit, of course, as a description for any other cavity, including one which happens to be nasal.

To conclude, Roy’s investigation of adjective-based AS-nominals reveals directly that they are only available in precisely those cases in which a predicative adjective is possible. The characterization, I submit, cannot be based on the semantics of the adjective, but rather must be based on the availability of functional structure, and specifically DegP, in turn a prerequisite for the emergence of a (stative) event complex in the predicate position. The simplest conclusion is thus that functional structure of some complexity and even more specifically, that associated with predicates and event structure, is a necessary prerequisite for the emergence of AS-nominals.

Beyond showing the necessity of functional event structure within AS-nominals, we note that the investigation of adjectives allows a broader perspective than that offered by verbs, precisely because adjectives are not always predicates, syntactically. Insofar as adjectives may be either predicative or non-predicative, and insofar as AS-nominals may only be formed from the former, this provides extremely strong support not only for the syntactic derivation of AS-nominals, but

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37 The representation in (150c) abstracts away from the placement of T and g-asp.

In assuming that attributive adjectives never contain a full predicative structure I differ from Roy (2009). I assume without further discussion that in expressions such as the blue wall, blue may but need not be a DegP, although I leave open the possibility that it is dominated by some adjectival ExP-segment that is distinct from DegP, and which may also be present in cases such as the former president.
for the availability, within them, of a functional, inherently predicative event complex.

3.9 Of the Onward Journey

The purpose of this chapter has been to establish the necessity of postulating a syntactic verbal constituent within de-verbal AS-nominals and a syntactic adjectival constituent within de-adjectival AS-nominals, where by “verbal/adjectival constituent” I refer here not only to the verbal/adjectival head itself, ostensibly present in derived R-nominals as well, but also to whatever syntactic structure is responsible for the emergence of argument structure and event interpretation. By way of addressing at least some traditional objections to this assumption, I suggested, without pursuing the matter in great detail, that limitations on the distribution of manner and event adverbs in AS-nominals may emerge from the existence, in English, of a modifier raising from within the verbal domain to the nominal domain, obligatorily for many speakers but optional for others, which results in the “adjectivalization” of that modifier. Insofar as there is a sharp distinction between the acceptability of manner and event adverbs in AS-nominals and the unacceptability of evidential and $g$-ASP adverbs, and insofar as manner and event adverbs are summarily excluded in simple events and R-nominals, even the limited occurrence of adverbs within AS-nominals serves as strong evidence for the presence of a VP complex, including event structure but excluding T/C as well as $g$-ASP.

Some leads towards a solution for other puzzles originally pointed out by Chomsky (1970) were suggested as well, although not yet pursued in detail. Thus I pointed out that Raising-to-Object (including small clauses), Raising-to-Subject, and Tough constructions, all barred in de-verbal AS-nominals, are all statives, raising the possibility that the culprit here is not movement, but rather the fact that AS-nominals somehow exclude stative verbal predicates. Thus we noted in that very same context that Raising-to-Object or ECM configurations in resultative small clauses are not similarly constrained in either English or Hebrew, making a structural distinction prima facie extremely plausible. Note specifically that in the resultatives in (151a–c), the object is not the logical object of the verb):38

(151)  a. Mary’s singing of the baby asleep  
b. the rooster’s crowing of the children awake  
c. Bill’s running of his shoes to the ground

Equally grammatical are the cases in (152) where “raising” is less plausible but where a small clause nonetheless is extremely plausible:

(152)  a. Mary’s burning of the kitchen walls black  
b. Bill’s hammering of the metal flat  
c. Jill’s breaking of the window apart

38 Alternatively, of course, it is possible that eventive AS-nominals contain some escape hatch allowing raising from resultatives, and that such an escape hatch is missing in stative AS-nominals. The matter is not pursued here any further.
A number of other questions were raised, concerning both English and Hebrew, throughout this chapter, to which we must now turn in the context of a more articulated structure for AS-nominals. Among them are, at the very least, the followings:

(153) **English:**
   a. What blocks objective case in AS-nominals in English? (see Chapter 4, section 1)
   b. What is the status of the pre-nominal argument in English when it is interpreted as the logical subject? (see Chapter 4, section 1)

(154) **Hebrew:**
   a. Why is the Hebrew by-phrase, ?al yedey, freer in its distribution in AS-nominals than it is within clausal verbalizing contexts (cf. (71)–(73) and related discussion)? (see Chapter 5, section 5)
   b. Why are two post-nominal šel phrases ungrammatical in AS-nominals, but fully grammatical in R-nominals (cf. the ungrammaticality of (23)–(27) of Chapter 2 vs. the grammaticality of (20)–(22))? (see Chapter 4, section 1)

(155) **Both English and Hebrew:**
   a. Why can subjects be missing in AS-nominals but not in sentences? (see Chapter 5, throughout)
   b. How is genitive assigned in AS-nominals (or for that matter, in nominals in general)? By extension, what are of-phrases? What are šel-phrases? (see Chapter 4, section 1)

We take this opportunity to also return the reader to the promissory notes in section 3.2.2 that have yet to be addressed:

(156) a. What blocks transitive occurrences of growth? (see Chapter 7, section 3.4 as well as Chapter 12, section 3.2.1)
   b. What blocks Particle Shift in AS-nominals? (see Chapter 4, section 5) (see also Borer 2005b)
   c. Why is Dative Shift blocked in AS-nominals? (see Chapter 4, section 1)

And finally:

(157) Granting that Raising-to-Subject, Raising-to-Object, and Tough constructions are barred as AS-nominals because they are statives, why, indeed, are stative de-verbal AS-nominals barred? (see Chapter 4, section 2)

In the next two chapters I turn to a fuller analysis of the structure of AS-nominals. What, I hope, will emerge from that discussion is not only a compelling picture of the syntactic derivation of such nominals but also a blueprint for the properties of syntactic word formation.
AS-nominals and AS-nominalizers

4.1 The Licensing of Arguments

4.1.1 Event structure—the schemes

In Chapter 3, I provided evidence for the existence of a verbalized complex inside AS-nominals in Hebrew and in English, and by extension, universally. Given the specific approach to event structure already outlined in Chapter 2, I concluded that the structure of AS-nominals must be, at least at some level, as schematized in (1). I further suggested that at least in the configurations thus far considered, the highest argument in (1) raises to the nominal domain, and the emerging (still rather schematic) structure is as in (2) (with ExS-N a label for some nominal ExP-segment):

(1) \[ \begin{array}{ll}
N & C_N[V] \\
C & \text{argument 1} \quad \left( [_{\text{as}^\text{in}/\text{ASP}_Q} \text{ argument 2}] \quad [C=V \quad \ldots \quad \ldots] \right) \\
\end{array} \]

(2) \[ \begin{array}{ll}
N & C_N[V] \\
C & \text{ExS-N argument 1} \quad C_N[V] [C=V \quad \ldots \quad \ldots] \\
\end{array} \]

In (1)–(2), an event structure of some sort is embedded under N, including, at the very minimum, the node E which licenses the event argument and which, I assume, is obligatory for any event structure and event interpretation to emerge. Regardless of the final position or interpretation of the argument licensed in its specifier or the existence or lack thereof of additional nodes such as F\text{SHL}/ASPQ, the C-core is rendered V-equivalent in the context of E.\footnote{As I will suggest in Chapter 6, Extended Projections are effectively defined by the shared Categorial Complement Space of their segments. It therefore emerges that E renders its CCS V-equivalent, but so would ASPQ under the assumption that it is a segment of the same Extended Projection. I remain non-committal on whether F\text{SHL}, by assumption semantically vacuous, is a generic node, acquiring its properties in the context of its Extended Projection context, or a specific instantiation, in this particular case associated with partitive case.} In turn the head of the C-core, by definition V\text{min} (or V\text{min-equivalent}) but possibly also V\text{min/max}, adjoins to C_N[V], a nominal functor, to create the derived nominal. As I argued in Chapter 2 (and see an additional extensive discussion in Chapter 9), the V-equivalent head which merges with C_N[V] must be an otherwise phonologically attested verb. It was precisely that fact that barred the emergence of AS-nominals which are not derived from actual attested verbs such as lesson, trip, class, event, although, in themselves, event-denoting.

\[ \left( [_{\text{as}^\text{in}/\text{ASP}_Q} \text{ argument 2}] \quad [C=V \quad \ldots \quad \ldots] \right) \]
Recapping briefly the discussion in Chapter 2, section 4 as well as in Chapter 3, the embedding of event structure under $C_{n[V]}$ together with the hypothesized movement of an argument to some nominal functional specifier yields, at least for Hebrew, the following four (pre-adjunction) schemes, where Hebrew $š$ (as well as English of) is the phonological spellout of case available in nominal functional specifiers:

\begin{enumerate}
\item[a.] Unaccusatives (quantity):
\begin{align*}
[D_{\text{E-S-N}_{2}} C_{n[v]} \{ D_{\text{E-S-N}_{1}} źel of DP_{1} \} C_{n[v]} \{ E_{\text{D}} \{ DP_{1} \} \} \{ E_{\text{ASP}} \} \{ D_{\text{E}} \{ DP_{2} \} \} \{ E_{\text{ASP}} \} \{ E_{\text{ASP}} \} \{ E_{\text{ASP}} \} \}]
\end{align*}
\item[b.] Unergatives (non-quantity):
\begin{align*}
[D_{\text{E-S-N}_{2}} C_{n[v]} \{ D_{\text{E-S-N}_{1}} źel of DP_{1} \} C_{n[v]} \{ E_{\text{D}} \{ DP_{1} \} \} \{ E_{\text{ASP}} \} \{ D_{\text{E}} \{ DP_{2} \} \} \{ E_{\text{ASP}} \} \{ E_{\text{ASP}} \} \{ E_{\text{ASP}} \} \}]
\end{align*}
\item[c.] Transitive, Telic (quantity)
\begin{align*}
[D_{\text{E-S-N}_{2}} C_{n[v]} \{ D_{\text{E-S-N}_{1}} źel of DP_{1} \} C_{n[v]} \{ E_{\text{D}} \{ DP_{1} \} \} \{ E_{\text{ASP}} \} \{ D_{\text{E}} \{ DP_{2} \} \} \{ E_{\text{ASP}} \} \{ E_{\text{ASP}} \} \{ E_{\text{ASP}} \} \}]
\end{align*}
\item[d.] Transitive, Atelic (non-quantity)
\begin{align*}
[D_{\text{E-S-N}_{2}} C_{n[v]} \{ D_{\text{E-S-N}_{1}} źel of DP_{1} \} C_{n[v]} \{ E_{\text{D}} \{ DP_{1} \} \} \{ E_{\text{ASP}} \} \{ D_{\text{E}} \{ DP_{2} \} \} \{ E_{\text{ASP}} \} \{ E_{\text{ASP}} \} \{ E_{\text{ASP}} \} \}]
\end{align*}
\end{enumerate}

Two immediate differences emerge between Hebrew and English, if we seek to assign to both languages the schematic structures in (3). The first concerns the availability in Hebrew AS-nominals, but not in English, of objective case-marking (presumably ambiguous between accusative and partitive). The second concerns the availability in English, but not in Hebrew, of genitive case with 's above the highest possible landing site of the derived N.\footnote{This is by most accounts, and dating back to Abney (1987), in Spec,DP. In Borer (2005a), however, I propose it merges in Spec,/#. The account here is structurally and theoretically neutral on the question of whether some of phrases, in English or in Hebrew, are derived from relative clauses (see, most particularly, Kayne 1994; Cinque 2010), providing the latter would still allow an argument to move from a lower domain and thus be realized.}\footnote{For the explicit claim that accusative case checks tense properties, see Pesetsky and Torrego (2004).}\footnote{The expressions in (i), without źel, and rather as A-headed constructs, do occur. As already noted in Chapter 3, however, Construct formation is possible with A-heads. The distribution of źel on the other hand, is restricted not just to nominal expressions, but specifically to nominal expressions in direct scope of $g$-ASP or T, and specifically, for our purposes, in Spec,FSHL or Spec,ASP.\footnote{For the explicit claim that accusative case checks tense properties, see Pesetsky and Torrego (2004).}} That this is, indeed, plausibly so emerges from the fact that of marks DP in the syntactic context of adjectives, including in cases where the dependency is not easy to characterize as semantic complementation. Hebrew źel is impossible in all such contexts.\footnote{The expressions in (i), without źel, and rather as A-headed constructs, do occur. As already noted in Chapter 3, however, Construct formation is possible with A-heads. The distribution of źel on the other hand, is restricted not just to nominal expressions, but specifically to nominal expressions in direct scope of $g$-ASP or T, and specifically, for our purposes, in Spec,FSHL or Spec,ASP.\footnote{For the explicit claim that accusative case checks tense properties, see Pesetsky and Torrego (2004).}}
(4)  a. proud of his son  
     b. aware of her virtues  
     c. blue of eyes  
     d. red of roof

(5)  a. ge’a  {šel/be}-bn.a  
     proud  {of/in}-son.her
     
     b. mud?at {le/šel} ma?alote.ha  
     aware  {to/of} virtues.her
     
     c. kaxol (*šel) ?eynayim  
     blue  of  eyes
     
     d. adom (*šel) gag  
     red  of  roof

Suppose we further suggest that English ’s is the spellout of case realization in Spec,D (or Spec,#), or at any rate, in a specifier which is higher than the final landing site of the English N. We can now assign to the Hebrew and English Long nominals in (6)–(7) the structures in (8)–(13) (irrelevant details omitted; adjectives provided to exclude a gerundive construal):5

(6)  a. Kim’s formation of the committees  
     b. Kim’s pushing of the cart  
     c. the doctor’s (loud) laughing  
     d. the laughing of the doctor  
     e. the candidate’s (repeated) voting against the bill  
     f. the repeated voting of the candidate against the bill  
     g. the arrival of the train  
     h. the train’s arrival

which the non-head is an individual (and see fn. 5 for a related point. See Borer 2011, 2013 for further discussion):

(i)  a. kxol ?eynayim  
     blue  eyes  
     ‘blue of eyes’
     
     b. adom gag  
     red  roof  
     ‘red of roof’

5 In Borer (2011), I argue that English ’s does not always indicate the presence of a genitive function. It does, however, do so in the presence of an individual reference for the DP thus marked. As arguments of AS-nominals always do have individual reference, for these cases, even though not necessarily for others, the presence of a genitive function is thus justified. I am setting aside here the nature of ’s in cases such as (i), as these are altogether excluded in AS-nominals (cf. ii):

   (i)  a car of John’s  
   (ii) *the destruction of the city of John’s  
       the city destruction of John’s (*in two hours) (only licit as e.g. a title for a work of art or similar)
7) a. *ha.šbira* *šel* Ran 'et ha.kise
the.breaking *šel* Ran *om* the.chair

b. *ha.mešika* *šel* Ran 'et ha.xebel
the.pulling *šel* Ran *om* the.rope

c. *ha.rica* *šel* Ran
the.running *šel* Ran

d. *ha.nepila* *šel* Ran
the.falling *šel* Ran

8) a. Active (Long) derivation, transitive, quantity, English (6a):

```
D
    
Kim
    's
ExS-N

Kim
[\(\text{C}=\sqrt{\text{FORM}}\)-ation]
C_{N[v]}

C_{N[v]}

\(\text{C}=\sqrt{\text{FORM}}\)
\(\text{E}\)

\(\text{Kim}\)
[\(\text{C}=\sqrt{\text{FORM}}\)]
ASPQ

\(\text{of committees}\)
\(\uparrow\)
[\(\text{C}=\sqrt{\text{FORM}}\)]
[\(\text{C}=\sqrt{\text{FORM}}\)]
```

b. Active (Long) derivation, transitive, quantity, Hebrew (7a):

```
D
    
ExS-N2
    
ExS-N1

[\(\text{C}=\sqrt{\text{FORM}}\)]
\(\text{šel}\) Ran

\(\text{šel}\) Ran

\(\text{C}_{N[v]}\)

\(\text{C}_{N[v]}\)

\(\text{C}_{N[v]}\)

\(\text{C}_{N[v]}\)

\(\text{E}\)

\(\text{Ran}\)

\(\text{ASPQ}\)

\(\text{‘et ‘chair’}\)
\(\uparrow\)
[\(\text{C}=\sqrt{\text{FORM}}\)]
[\(\text{C}=\sqrt{\text{FORM}}\)]
(9) a. Active (Long) derivation, transitive, non-quantity, English (6b):

D

Kim

’s

ExS-N

Kim

\[c=v\sqrt{\text{PUSH}}\] -ing

\[c=v\sqrt{\text{PUSH}}\] C_N[v]

ING_N[v]

E

\[c=v\sqrt{\text{PUSH}}\] ING_N[v]

\[c=v\sqrt{\text{PUSH}}\] Kim

FSHL

of cart

\[c=v\sqrt{\text{PUSH}}\]

\[c=v\sqrt{\text{PUSH}}\]

b. Active (Long) derivation, transitive, non-quantity, Hebrew (7b):

D

ExS-N2

\[c=v\sqrt{\text{MŠK}}\] + C_N[v]

/\text{mešik}/

ExS-N1

‘pulling’

šel Ran

\[c=v\sqrt{\text{MŠK}}\] - C_N[v]

C_N[v]

E

\[c=v\sqrt{\text{MŠK}}\]

\[c=v\sqrt{\text{MŠK}}\] Ran

FSHL

‘et ‘rope’

\[c=v\sqrt{\text{MŠK}}\]

\[c=v\sqrt{\text{MŠK}}\]
(10) **Active (Long) derivation, unergative, English (6c–d):**

a. D

\[\text{doctor}^{'}s\]

D

doctor

[\text{ING}_{N[v]}/C_{N[v]}]

[\text{ING}_{N[v]}/C_{N[v]}]

\[\text{doctor}\]

[\text{ING}_{N[v]}/C_{N[v]}]

[\text{ING}_{N[v]}/C_{N[v]}]

\[\text{ING}_{N[v]}/C_{N[v]}\]

E

b. D

\[(\text{the})\]

D

\[\text{ExS-N2}\]

\[\text{ExS-N1}\]

\[\text{of doctor}\]

\[\text{ING}_{N[v]}/C_{N[v]}\]

\[\text{ING}_{N[v]}/C_{N[v]}\]

\[\text{ING}_{N[v]}/C_{N[v]}\]

E

(11) **Active (Long) derivation, unergative, Hebrew (7c):**

D

\[\text{ExS-N2}\]

\[\text{ExS-N1}\]

\[\text{Ran}\]

\[\text{Ran}\]

\[\text{Ran}\]

\[\text{Ran}\]
(12) Active (Long) derivation, unaccusative, English (6g–h):

a. 

```
D
  
'train's ExS-N
  
train
  
[C=V \sqrt{ARRIVE}]-al C_N[v]
  
C_N[v]
  
E

[C=V \sqrt{ARRIVE}] C_N[v] train

[C=V \sqrt{ARRIVE}] train

ASP_o
```

b. 

```
D
  
ExS-N2
  
[C=V \sqrt{ARRIVE}]-al ExS-N1
  
of train
  
↑

[C=V \sqrt{ARRIVE}]-al C_N[v]
  
C_N[v]
  
E

arrive C_N[v] train

arrive ASP_Q

train

[C=V \sqrt{ARRIVE}] [C=V \sqrt{ARRIVE}]```
These proposed structures, however, remain rather general. The astute reader would also no doubt discover a number of surprising asymmetries in the English paradigm, concerning the distribution of general \( C_{N[V]} \) functors and those specifically labeled as \( \text{INGN}_{N[V]} \). Before I elaborate on these structures, however, I would like to propose one argument, indeed, an explanatory result, that follows directly from the specific claims made concerning the realization arrays associated with English \( \text{of} \) and Hebrew \( \text{šel} \) respectively.

### 4.1.2 How many arguments? \( R \)-nominals vs. \( AS \)-nominals

Suppose we consider again the observations made in Chapter 2, section 2, concerning the distribution of English \( \text{of} \) vs. Hebrew \( \text{šel} \), the latter exhibiting a behavior identical to that argued for in Romance (cf. Zubizarreta 1987) as well as for Polish (cf. Rozwadowska 1997). Specifically, and augmented with some conclusions otherwise reached in Chapter 3 and directly above in section 4.1.1, the generalizations that emerged (slightly modified from (32) of Chapter 2) are as follows:

1. **\( R \)-nominals:**
   a. English allows two realizations of genitive. One, pre-nominal, is realized as ‘s. The other, post-nominal, realized as \( \text{of} \). Two \( \text{of} \) realizations are not allowed within the same nominal.
   b. Hebrew, Romance, and Polish allow up to three post-nominal genitive realizations (\( \text{šel} \), \( \text{de/di, GEN} \)). Romance and Polish, but not Hebrew, allow a pre-nominal genitive realization for (some) pronouns.
b. **AS-nominals:**

i. English allows two realizations of genitive. One, pre-nominal, is realized as ’s. The other, post-nominal, is realized as of. Two of realizations are not allowed within the same nominal (thus far, identical to R-nominals).

ii. In the absence of (some) relations with T and/or g-asp, objective case in English (accusative, partitive) is realized as of. Hebrew objective marker ’et, by assumption, is not T dependent and is hence available within AS-nominals.

iii. Hebrew, Romance, and Polish allow at most one post-nominal genitive realization. Romance and Polish, but not Hebrew, allow a pre-nominal genitive realization for (some) pronouns.

English, then, but clearly neither Hebrew nor Romance, bars across the board the iteration of of-phrases. Suppose now that this is a superficial, phonological restriction, a “Double-of Filter”, so to speak, rather reminiscent of similar restrictions against the concatenation of -ing (The Double-ing Filter, cf. Ross 1972; see also Milsark 1972), or the concatenation of [à DP] in French causatives (cf. Kayne 1975) or in Spanish dative constructions (cf. Jaeggli 1982). The restriction would directly bar the English equivalents of both (15b) and (16b), although in (15b), an R-nominal, both instances of of are presumably in specifiers of the nominal Extended Projection, while in (16b), an AS-nominal, one instance of of is in a nominal functional specifier, while the second appears to be associated with an argument in Spec,ASPQ or Spec, FSHL. The net result for English would then be that the need to license two DPs, whether within a nominal or within an event or in a combination of the two, would force the higher one to re-merge pre-nominally where it can be licensed with ’s:

(15) a. \[D_{ ExS-N2}^{ } John \]  
    \[ExS-N1_{ } girl \]  
    \[N_{ } picture \]

b. \[*D_{ ExS-N2}^{ } picture \]  
    \[ExS-N1_{ } of John \]  
    \[ExS-N1_{ } of girl \]  
    \[N_{ } picture \]

c. \[D_{ ExS-N2}^{ } John ’s picture \]  
    \[ExS-N1_{ } of John \]  
    \[ExS-N1_{ } of girl \]  
    \[N_{ } picture \]

(16) \[D_{ ExS-N2}^{ } writing \]  
    \[ExS-N1_{ } of John \]  
    \[N_{ } writing \]  
    \[E_{ } John \]  
    \[ASPQ/FSHL_{ } of letter \]

\[*D_{ ExS-N2}^{ } writing \]  
    \[ExS-N1_{ } of John \]  
    \[N_{ } writing \]  
    \[E_{ } John \]  
    \[ASPQ/FSHL_{ } of letter \]

\[D_{ ExS-N1}^{ } John ’s writing \]  
    \[ExS-N1_{ } of John \]  
    \[N_{ } writing \]  
    \[E_{ } John \]  
    \[ASPQ/FSHL_{ } of letter \]

Note now that in the derivation in (16), and in spite of the fact that the “subject”, John, is in Spec,D, the “object” letter could not move into any functional nominal specifier because John, presumably, has left a copy in every single one of them. Thus even if it were possible for letter to skip the copy of John in Spec,E, it would still not be able to re-merge within the nominal domain.

But now, as it turns out, we have a very ready explanation for why in Hebrew, Romance, and Polish genitive case within AS-nominals is different from that attested

\[\text{Note that a double-of is permitted providing a second of-phrase is embedded within the first:}\]

(i) a. the father of the daughter of the neighbor
b. the picture of the roof of the building
within R-nominals. Clearly, neither system has anything like a double šel or double de/gen filter, as the iteration of šel phrases, de phrases, and genitively marked nominals is entirely licit in R-nominals. Consider, however, why such iteration would be barred in AS-nominals and specifically, consider the equivalents of the English derivations, but now without the Double-of Filter, operative in English, as well as without the pre-nominal genitive realizations allowed in English, but barred across the board in Hebrew and restricted in Romance and Polish (examples from Hebrew, but relevant structures applicable to Romance and Polish as well): 7

(17) a.  

b.  

c.  

picture

(18) a.  

b.  

c.  

In the R-nominals in (15) and (17), both DPs merged, to begin with, as functional specifiers within the nominal Extended Projection, and are already in a configuration which assigns the higher one the interpretation of a possessor. We note as an aside that the fact that in Polish, specifically, a genitive preposition is not available, but rather the relevant DPs are directly case-marked as gen lends independent support to their being thus marked in some nominal specifier. That the restrictions on the distribution of DPs within nominals in Polish are identical to those attested in Romance and Hebrew, the latter with prepositions, thus lends support to the licensing of both di/de and šel in nominal specifiers as well on a par with the Polish gen-marked DPs.

When we turn to AS-nominals, now, we find that here, the relevant DPs merge within the event domain embedded under CN[V], and not directly within the nominal. Their movement to nominal specifiers, in turn, is restricted by locality, resulting in delimiting such movement to exactly one DP. The movement of a second would be perforce blocked by the copies of the first.

If nothing else is added, we expect this situation to be the norm for AS-nominals. If so then, it would tend to surface as a strong preference for the Short derivation of AS-nominals, one in which one of the arguments, and specifically the external one, can be licensed through the existence of a by-phrase or its typological equivalent. Typologically, we find that this is exactly correct. Long AS-nominals, on the other hand, are only expected to surface if the language happens to have available to it a device that allows objective case to be assigned in Spec,ASPQ or Spec,FSHL, despite the absence of T or G-ASP. As it turns out, both English and Hebrew do have such a device, but not so Romance or Polish. In Hebrew, 'et is by assumption independent of T/G-ASP and thus licit in AS-nominals. In English, its realization is distinct in the

7 Recall that in Hebrew the possessor c-commands the nominal complement regardless of surface order. See Chapter 3, section 2 for the detailed discussion.
context of T/g-asp (typically zero, pronominal marking notwithstanding) and in contexts that are not licensed by T/g-asp, where it surfaces, by assumption, as of. Importantly, from this perspective, the crucial property which distinguishes AS-nominals from clauses is not the actual realization of objective case, the latter relegated to a relatively superficial effect, but the presence in some languages, but not in others, of objective case which is not contingent on the presence of T/g-asp. The primary asymmetry, then, is not between English, and its of marking of the object, and Hebrew, marking it as 'et, but between English and Hebrew, on the one hand, where two direct arguments are possible within AS-nominals, and e.g. Romance and Polish, where two such direct arguments are only attested when the subject is a pronominal, i.e. exactly when a second case is available.

In this context, it is worthwhile considering what strategies grammars might use in constructing AS-nominals, when only one direct argument is possible. Particularly instructive, in this respect, is the discussion of German AS-nominals with -ung (cf. Ehrich and Rapp 1999; Ehrich 2002). In German, and across the board for both AS-nominals and R-nominals, pre-nominal genitive is only possible for proper names and for pronouns. Post-nominally, only one genitive is ever licensed. Of the case assignment possibilities within German AS-nominals, Ehrich and Rapp say the following:8

The position of the pre-nominal genitive is, in general and with some clear exceptions, not accessible in German. Therefore, arguments of transitive verbs [within AS-nominals] have to compete for projection into the position of the post-nominal genitive.

From our perspective, then, German, like English, does not allow the post-nominal concatenation of genitives, whether these are directly marked on the DP or of the of variety, as in English. Unlike English, however, its pre-nominal licensing possibilities are limited. The result is the availability of exactly one position for which direct arguments otherwise barred in the pre-nominal position need to compete. Interestingly, that competition yields distinct results in distinct event types, at times favoring the logical subject and at others the logical object. Within the specific approach to events favored in Ehrich and Rapp (1999), they state the following:

The competition is constrained: the lowest thematic argument under BECOME has priority. Where the base verb does not include a BECOME predicate, the projection into the position of the post-nominal genitive remains unconstrained and the genitive is ambiguous between a subject or agent reading and an objective or patient reading.

Converted into the terminology used here, the claim is equivalent to favoring the Subject-of-Quantity (internal argument of telic predicates), where present, but leaving the choice open in atelic, non-quantity cases. Given the view espoused here that event interpretation is determined by the presence of a particular syntactic architecture and not by properties of verbs, the observation in Ehrich and Rapp (1999) could thus be stated as follows:

8 A second post-nominal DP can be licensed in German R-nominals with von, although the option appears extremely limited, if ever licit, for AS-nominals and is hence set aside here.
(19)  a. For a quantity reading to emerge an “internal” quantity DP is obligatory. If only one direct argument can be realized within AS-nominals, then a quantity reading is incompatible with the realization of the Originator as a direct argument.

b. In the absence of a quantity reading, either argument may be realized as a direct argument.

We note now that it is significant that the choice of the directly realized argument is not contingent on putative selection by the verb (i.e. it need not always be the “internal” argument), but rather on event structure. In (20)–(23), exemplifying the emerging picture, Ehrich and Rapp’s agent is replaced with an Originator and their patient is replaced with either Subject-of-Quantity or (default) Participant, as appropriate; (stars, rather than #, as per Ehrich and Rapp 1999):

(20)  Originator_{GEN}  [non-quantity]
    a. Die Vernehmung des Richters
       the interrogation (of.the) judge
    b. Die Beratung der Experten
       the advising (of.the) expert
    c. Die Beobachtung des Astronomen
       the observation (of.the) astronomers

(21)  Participant_{GEN}  [non-quantity]
    a. Die Vernehmung des Zeugen
       the interrogation (of.the) witness
    b. Die Beratung der Kunden
       the advising (of.the) client
    c. Die Beobachtung der Sterne
       the observation (of.the) stars


(22)  Originator_{GEN}  [quantity]
    a. *Die Abfassung des Gutachters
       the drafting (of.the) expert
    b. *Die Fertigstellung des Studenten
       the finishing (of.the) students
    c. *Die Vollendung des Komponisten
       the completion (of.the) composer
    d. *Die Abschaffung des Kanzlers
       the abolishment (of.the) chancellor
(23) Subject-of-Quantity\textsubscript{GEN} [quantity]

a. Die Abfassung des Gutachtens
   the drafting (of.the) report

b. Die Fertigstellung des Referats
   the finishing (of.the) term papers

c. Die Vollendung der Symphonie
   the completion (of.the) symphony

d. Die Abschaffung des Geheimdienstes
   the abolishment (of.the) secret service

The German situation, then, corroborates the claim that the availability of direct arguments within AS-nominals is contingent on possibly language specific devices that may license case-marking in Spec,ASP\textsubscript{Q} or Spec,F\textsubscript{SHL} in the absence of T or G-ASP. Particularly strong evidence emerges for this claim when we note that when such conditions on realization are relaxed, a dyadic AS-nominal may occur. As a German pre-nominal genitive is licit for pronouns and proper names, we expect, and indeed we get, the grammaticality of (24):

(24) a. Marias Zerstörung des Klaviers
   Maria\textsubscript{GEN} destruction the\textsubscript{GEN} piano\textsubscript{GEN}

b. Meine Zerstörung des Klaviers
   my destruction the\textsubscript{GEN} piano\textsubscript{GEN}

(with special thanks to U. Steindl, p.c.)

Even more importantly, we note that the facts for German (and as noted in Ehrich 2002) are extremely difficult to accommodate within the approach presented in Grimshaw (1990), as well as in Marantz (2000), or more recently Embick (2010) (and see also Alexiadou 2001 and Harley 2009a). Specifically, the distribution of arguments and interpretations in German AS-nominals appears compatible with two very distinct types of analysis. One, as indeed advanced in Ehrich and Rapp (1999) and in Ehrich (2002), is that of semantic decomposition, linked, specifically, to verbs and inherited, in AS-nominals, by the derived nominal. Regardless of its syntactic merits, such an analysis clearly entails that event structure is fundamentally a verbal, rather than a nominal, property. The second approach is that advanced in Borer (2005b) and briefly outlined in Chapter 2, which relies on syntactic event structure to generate quantity and non-quantity events and interpretations and always in conjunction with the presence of a verbal Extended Projection. The reasons for favoring the syntactic route over the lexical-semantic route are expounded in some detail in Borer (2005b) and will not be repeated here. We do note, however, that any attempt at an adequate explanation here must trace the effects to the existence of some verbal structure, however characterized, and to the assumption that event structure, however characterized, is present in an identical fashion within AS-nominals and within clauses. German, then, doesn’t only provide evidence for the system of case within AS-nominals sketched here, but also for the fundamental claim that there is event structure within AS-nominals, and that it follows the same architectural—and interpretational—guidelines as that of clauses.
(25) contains a summary of our conclusions on case assignment within AS-nominals:

(25) a. Hebrew šel as well as Romance di/de and Polish genitive case are genitive realizations available exclusively in nominal (functional) specifiers. They are never objective markers.

b. A pre-nominal genitive strategy (Saxon Genitives) is available across the board in English, but only in a limited way in German, Romance, and Polish. It is altogether missing in Hebrew.

c. English objective of as well as Hebrew object marking (at times, but not always with 'et) are the realizations of objective marking which need not be licensed by T or g-asp. Romance, Polish, and German do not have T/g-asp-independent objective markers.

d. Across the board, English bars two post-nominal realizations of of, having, effectively, a Double-of Filter; across the board, German bars two post-nominal realizations of 'gen', having, effectively, a Double-gen Filter. No such filters exist in Romance, Hebrew, and Polish.9

4.1.3 Blocking ditransitives in AS-nominals

We note now that if the system of case and argument licensing outlined here is correct, we can directly account for the fact that English ditransitives cannot occur in AS-nominals. Specifically, consider the following well-known contrasts between, e.g., gerunds and AS-nominals:

(26) a. Carly’s giving the children candy
    b. Carly’s giving candy to the children

(27) a. Carly’s generous giving of candy to the children
    b. *Carly’s generous giving (of) the children (of) candy

English, recall, may license objective marking with of, and may further license an additional argument, the highest one, pre-nominally with ‘s-marking. What, however, of the third argument? It cannot be licensed in any nominal functional projection, as all possible merger sites have been pre-empted by the “logical subject” Carly moving up to Spec,D. Nor can it receive an objective marking from of, due to the existence of the Double-of Filter. As a result, the derivation in (27b) cannot converge.

9 A hypothetical alternative would postulate, in German, gen in (23) and possibly in (21) as well as an objective marker, but continuing to exclude the subject in such cases due to the existence of our Double-gen Filter. The hypothetical alternative, however, runs afoul of the well-known typological observation typically referred to as “Burzio’s generalization”, according to which objective case is barred in the absence of an Agent, or an Originator. The logic of the system, then, determines that whatever role is associated with the sole argument should correlate with the primary argument, i.e. nominative in clauses and genitive in the presence of D, if English gerunds are to be consulted.
What can converge, of course, is the derivation in (27b) where the goal argument is otherwise licensed. What can further converge are the derivations in (28), precisely because only two arguments are in need of licensing (adjectives provided to exclude gerundive construal).

(28)  
   a. Carly’s generous giving of gifts  
   b. Carly’s generous giving to needy children

Nor is it particularly surprising, now, to find out that (29a) is ungrammatical, insofar as its ungrammaticality corresponds directly with that of its clausal correlate in (29b). In fact, insofar as such a parallelism obtains—although in the clausal case the goal argument is presumably accusative while in the AS-nominal it is of-marked—it fundamentally supports a parallel structure for clauses and for AS-nominals. It further supports the claim that of-marking, in such contexts, is a realization of objective, rather than genitive case:

(29)  
   a. *Carly’s generous giving (of) the needy children  
   b. *Carly gave needy children

Finally consider the ungrammatical cases in (30). These go beyond ditransitivity as such to exclude the raising of either “goal” or “patient” to the prenominal position:

(30)  
   a. *the candy’s (sudden) giving to the children  
   b. *the children’s (sudden) giving of the candy [“goal” construal for children]

As it turns out, however, the ungrammaticality of (30a–b) reduces directly to an otherwise well-established effect in AS-nominals which is entirely independent of ditransitivity, and that is the impossibility of any argument, with the exception of the logical subject, occurring in the pre-nominal position in AS-ING nominals, a matter already observed in Chapter 2 (see (71) and related discussion). Thus observe specifically the exclusion of raising in Short AS-ING nominals, as exemplified in the following contrast and specifically the ungrammatical cases in (33b):

(31)  
   a. the court’s formation of three committees  
   b. the court’s forming of three committees [Long]

(32)  
   a. the formation of three committees (by the court) (in order to . . . )  
   b. the forming of three committees (by the court) (in order to . . . ) [Short]

(33)  
   a. the committees’ formation (by the court) (in order to . . . )  
   b. *the committees’ forming (by the court) (in order to . . . ) [Short, Raising]

The ungrammaticality of (33b) when contrasted with the fully licit (32b) and (33a) is a matter that is discussed at considerable length in Chapter 5, and is the effect, I argue, of the semantic function associated with ING. Given the contrast between (33b) and (33a), however, we expect an improvement for cases similar in structure to (30a), but involving ATK (G_N[V] realized as ation and kin) rather than ING_N[V]. Such
improvement is, indeed, in full evidence in (34).\(^{10}\) That the nominalizing affix is the culprit can be directly ascertained when (34) is compared with the considerably deteriorated minimally contrasting (35).

(34)  
   a. the gift’s transmission to the children (in order to secure it)  
   b. ?the money’s donation to the church (in order to allow it to build a new wall)

(35)  
   a. *the gift’s transmitting to the children (in order to secure it)  
   b. *the money’s donating to the church (in order to allow it to build a new wall)

In turn, the verbal instantiations that underlie the derived nominals in (34)–(35) are altogether impossible in ditransitive contexts, and as a corollary, the goal is altogether optional, making the derivation of anything comparable to (30b) an a priori impossibility:

(36)  
   a. Mary transmitted the gift  
   b. John donated the money

(37)  
   a. *Mary transmitted the children the gift  
   b. *John donated the church the money

The absence of such cases in English may or may not be theoretically telling. As has been amply observed (starting with Oehrle 1976) Latinate verbs do not enter the dative alternation. In turn, and with few exceptions, non-Latinate verbs can only be nominalized with $\text{ING}_{\text{N}[\text{V}]}$. It therefore follows that verbs which have ditransitive variants may only be nominalized with $\text{ING}_{\text{N}[\text{V}]}$. Beyond correlations having to do with vocabulary stock, however, the situation certainly brings to mind the distinction, drawn in Talmy (2000), between satellite frame and verb frame systems, all the more so as “native” vocabulary is typically associated with satellite properties, while Latinate forms are more frequently than not associated with verb-frame. Note, in this context, that particle verbs, likewise, rarely nominalize with ATK (see, in particular, the discussion of Particle Shift in section 4.7). From the perspective of our discussion here, two matters are crucial. First, and insofar as the absence of Dative Shift in derived nominals has been used to argue against their syntactic treatment, it rather turns out that the absence of Dative Shift emerges partly as a result of independent restrictions on the distribution of of-phrases, and partly as a result of independent restrictions on the raising to a pre-nominal position in the case of AS-ING nominals.

From a considerably broader perspective, and if we assume that the essential veracity of the claim that the distribution of Dative Shift is fundamentally tied in to the ± Latinate nature of the vocabulary stock, it emerges directly that contrary to the earliest lexicalist arguments (cf. Bresnan 1978), the availability of Dative Shift for

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\(^{10}\) The acronym ATK is used here, and throughout, to facilitate the distinction between instantiations of $\text{C}_{\text{N}[\text{V}]}$ that spell out as ATK, and instantiations of $\text{ING}_{\text{N}[\text{V}]}$. It is important, however, to bear in mind that ATK is in actuality a pure, otherwise semantically bleached, syntactic C-functor, i.e. a “pure” case of $\text{C}_{\text{N}[\text{V}]}$ with multiple realizational possibilities, while $\text{ING}_{\text{N}[\text{V}]}$ is also a semantic function, a point established in some detail in sections 4.4 and 4.5 below as well as in Chapter 12. See Chapter 6, section 2 for an extensive discussion of C-functors and the functions they name.
some verbs but not for others cannot provide evidence for lexical listing or, for that
matter, for syntactically relevant Content for roots. This is because it is contingent
purely on the modes of phonological realization that are available in particular
syntactic configurations. Similar considerations apply to the distribution of Particle
Shift, thereby raising the possibility that the parametric choice postulated by Talmy
(2000), real as it may be syntactically, is driven not by the availability of particular
syntactic structures in some grammars but not in others, but rather by a particular
linkage between syntactic structures and phonological realization. That English
maintains both satellite frame and verb frame systems, but with phonologically
specialized vocabulary within each domain, most certainly provides direct evidence
for the assertion that the variation under consideration cannot be inter-grammatical,
and rather, may be intra-grammatical, and quite importantly, linked directly to
phonological factors.

Returning to AS-nominals, we note that if, indeed, the exclusion of ditransitives
emerges from a conspiracy, of sorts, between the Double-of Filter and the properties
of ING\(_{\psi[v]}\), then the absence of ditransitive in English AS-nominals may very well turn
out to be language-specific. In the presence of a “satellite frame” phonology, a freer
argumental licensing within AS-nominals, and a semantically bleached (or more seman-
tically friendly) C-functor, we do expect ditransitives to be available in AS-nominals,
and it is hoped that a deeper typological search would indeed yield such cases.\(^{11}\)

\(^{11}\) Hebrew does have a few cases of ditransitives. To the extent that they occur, they involve causative
constructions and are arguably bi-clausal. They further do not have a dative variant and their order is fixed.
We do note, however, that such cases allow two occurrences of objective marking both in propositions and
in AS-nominals, confirming, at least prima facie, our expectation that given the appropriate configuration,
ditransitives within AS-nominals should be possible:

(i) a. \textit{Ran he\_ebir ‘et rina ‘et ha.kbi\_}\n    \textit{Ran cross.cause \_om Rina \_om the.road}

b. \textit{Ran limed ‘et Rina carfatit}
    \textit{Ran taught \_om Rina French}

(ii) a. \textit{ha.ha\_\_abara \_\_el Dan ‘et Rina et ha.kbi\_}\n    \textit{the.crossing.cause \_of Dan \_om Rina \_om the.road}

b. \textit{ha.limud \_\_el Ran ‘et Rina carfatit}
    \textit{the.teaching \_of Ran \_om Rina French}

Dative Shift, on a par with English, is not attested. However, Siloni (1997) observes that there is a contrast
between the freedom of dative-accusative arguments in clausal VPs and the restriction, within
AS-nominals, to the order accusative>dative:

(i) a. \textit{Tal masra ‘et ha.seper le-Ran}
    \textit{Tal gave \_om the.book to-Ran}

b. \textit{Tal masra le-Ran ‘et ha.seper}
    \textit{Tal gave to-Ran \_om the.book}

(ii) a. \textit{mesirat Tal ‘et ha.seper le-Ran}
    \textit{giving Tal \_om the.book to-Ran}

b. *\textit{mesirat Tal le-Ran ‘et ha.seper}
    \textit{giving Tal to-Ran \_om the.book}

The matter is a puzzling one, as the unmarked, underived word order in Hebrew is in actuality
dative>accusative (see Belletti and Shlonsky 1995), thereby suggesting that somehow, in AS-nominals,
the basic word order is pre-empted. I set aside this matter in the rest of this volume.
By way of completing the picture, we note that the contrast in (26)–(27) now follows not from the presence of a VP in gerunds but not in AS-nominals, but rather from the distinct modes of case realization available within each of these configurations and which in turn result, ultimately, from the presence, within gerunds, of g-asp vs. its absence in AS-nominals. In the presence of g-asp, objective case in English is specifically not realized as of, and hence multiple occurrences of objective case, however otherwise licensed in ditransitives, do not fall under the Double-of Filter. The availability of ditransitives in gerunds thus follows directly from whatever general principles would usually license it in the presence of T or g-asp.

Finally, we note the pivotal role played, in our account, by the properties of ING_N[V], such that it bars the structures in (30a–b) and (33b). The properties of English de-verbal nominalizing functors, as a consequence, is our next topic, to be pursued after a brief heads-up in section 4.2.

4.2 Outstanding Issues and the Organization of this Chapter

Suppose we revisit the list of puzzles associated with the structure of AS-nominals as summarized in section 2.2 of Chapter 2 and in section 9 of Chapter 3, as well as some solutions as they emerge from the previous discussion:

(38) **English:**
   a. What blocks objective case in AS-nominals in English?
   b. What is the status of the pre-nominal argument in English when it is interpreted as the logical subject?
   c. What blocks adverbs within AS-nominals in English?

(39) **Hebrew:**
   a. Why is the Hebrew by-phrase, al yedey, freer in its distribution in AS-nominals than it is within clausal verbalizing contexts (cf. (71)–(73) of Chapter 3 and related discussion)?
   b. Why are two post-nominal šel-phrases ungrammatical in AS-nominals, but fully grammatical in R-nominals?

(40) **Both English and Hebrew:**
   a. Why can subjects be missing in AS-nominals but not in sentences?
   b. How is genitive assigned in AS-nominals (or for that matter, in nominals in general)? By extension, what are of-phrases? What are šel-phrases?

(41) **Additional puzzles:**
   a. What blocks transitive occurrences of growth?
   b. What blocks Particle Shift in AS-nominals?12
   c. Why is Dative Shift blocked in AS-nominals?
   d. What blocks Raising-to-Subject, Raising-to-Object and Tough constructions in AS-nominals?

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12 The term Particle Shift, as is true for many linguistic labels, harks back to an earlier theoretical stage, and specifically presupposes the base order to be V>prt>OBJ, and the order V>OBJ>prt to derive from the shifting of the particle rightwards. As this is the term actually in use in Chomsky (1970), and as that is the label traditionally associated with the phenomenon, no attempt at relabeling is made here. The reader should bear in mind, however, that most current analyses do not assume rightward movement of the particle, but rather movement of the [V-prt] to the left, over the object.
e. What is the reason for the asymmetry between AS-ING nominals and ATK-nominals illustrated by the paradigm in (31)–(33), and specifically, why is raising blocked in Short AS-ING nominals?

We note that a solution has now been offered for the puzzles in (38), in (39b), in (40b), and in (41c). Concerning the distribution of adverbs, I proposed in Chapter 3, sections 7.3 and 7.4, that for the majority of English speakers, event modifiers must raise and remerge within the nominal domain, leading to an “adjectival” spellout. Not so, however, for at least some speakers, for whom event modifiers may be licensed directly within the domain of the event and hence spell out as adverbs. Both strategies, we note, are fully grammatically attested in Hebrew AS-nominals and may occur side by side.

Turning to other proposed solutions, I suggested, specifically, that the distinction between the syntactic and semantic behavior of R-nominals and AS-nominals involves the existence, within the latter, of an event complex, which, in turn, is a verbalizer or an adjectivizer (in the intended sense), and the solutions proposed emerged as an interaction between those different structures, as well as from language-specific constraints on the realization of case within nominals. Thus I suggested that objective marking may have a different realization depending on whether or not it is licensed by T/G-ASP, and that in some languages, there is altogether no licit realization for objective case in the absence of T/G-ASP. By assumption, Hebrew objective realization, sometimes with an overt ’et, is excused from T/G-ASP licensing, as is, I suggested, English of. The latter, I also suggested, is ambiguous between an objective and a genitive realization, but in turn, is restricted to one occurrence per nominal. Not so, however, for Hebrew šel, Romance di/de, or Polish genitive case. They may not be licit as realizations for objective case, but on the other hand, they may freely double or even triple. Finally, and when there is no licit realization for objective case within AS-nominals, only one argument may be realized and AS-nominals appear, to all intents and purposes, to be monadic.

The chart in (42) summarizes our conclusions thus far (and where “independent obj-marking” is in reference to objective marking that is dependent of T/G-ASP).

<table>
<thead>
<tr>
<th></th>
<th>English</th>
<th>Hebrew</th>
<th>Romance /Polish</th>
<th>German</th>
</tr>
</thead>
<tbody>
<tr>
<td>independent obj-marking</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>identical to dependent</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>distinct from dependent</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>of</td>
<td>∅’et</td>
<td>no</td>
<td>no</td>
<td>no</td>
</tr>
<tr>
<td>pre-nominal genitive</td>
<td>yes</td>
<td>no</td>
<td>pron only</td>
<td>restricted</td>
</tr>
<tr>
<td>Double-GEN Filter</td>
<td>yes</td>
<td>no</td>
<td>no</td>
<td>yes</td>
</tr>
<tr>
<td>Event Adverbs</td>
<td>yes/no∅</td>
<td>yes</td>
<td>∅</td>
<td>∅</td>
</tr>
<tr>
<td>Evidentials; G-Aspect adverbs</td>
<td>no</td>
<td>no</td>
<td>∅</td>
<td>∅</td>
</tr>
<tr>
<td>Adv→Adj raising</td>
<td>yes∅</td>
<td>yes, optional ∅</td>
<td>∅</td>
<td>∅</td>
</tr>
</tbody>
</table>

∅ possible for some; excluded for others ∅ obligatory for some; optional for others

Finally, from this system I proceeded to derive the impossibility of ditransitives in English AS-nominals. Beyond the restrictions on case assignment within nominals, however, the impossibility of ditransitives was crucially also contingent on the specific properties of INGₙ[ν], and as such, interacted specifically with the puzzle in (41e), the solution to which is undertaken in Chapter 5.
Finally, I suggested, albeit tentatively, that an explanation for the absence in AS-nominals of *Raising* (to subject and to object) as well as of *Tough* constructions resides in the fact that they all are statives (see Chapter 3, section 3).

Setting aside the Hebrew-specific puzzle in (39a), to which I return in some detail in Chapter 5, section 5.4, we note the following two outstanding puzzles:

(43) growth is obligatorily intransitive:
   - a. the farmer’s growing the tomatoes/the tomatoes’ growing
   - b. the growth of tomatoes [intransitive reading only]
   - c. *the farmer’s growth of tomatoes

(44) Particle Shift is impossible in AS-nominals:
   - a. Pat’s writing up of the letter
   - b. *Pat’s writing of the letter up

Interestingly, and as we shall see rather crucially, both these puzzles interact with the distribution of nominalizing C-functors. As already observed in Chomsky (1970), the growth effect is pre-empted in ING nominals, whose behavior tallies with that of the corresponding verb:

(45) a. the growing of tomatoes [ambiguous]
   - b. the farmer’s growing of tomatoes

*Particle Shift* similarly interacts with ING for the simple reason that particle constructions, of any variety, are altogether impossible with ATK nominals. As it turns out, very few verbs which allow *Particle Shift* actually take ATK nominalizers. The following, however, do, and not only the correlate of (44b) but that of (44a) is entirely ungrammatical:

(46) a. the adding up of the numbers
   - b. the growing up of the children [intransitive]
   - c. the paying up of debts

(47) a. *the adding of the numbers up
   - b. *the growing of the children up [intransitive]
   - c. *the paying of debts up

(48) a. *the addition up of the numbers
   - b. *the growth up of the children [intransitive]
   - c. *the payment up of debts

(49) a. *the addition up of the numbers
   - b. *the growth up of the children [intransitive]
   - c. *the payment up of debts
It thus emerges that an investigation of the properties of English nominalizing C-functors is crucial to the resolution of, at the very least, puzzles (41a, b, e), as well as the complete understanding of the behavior of ditransitives, i.e. puzzle (41c). As we shall see, a fuller understanding of the properties of ING will also be extremely instrumental in understanding the impossibility of Raising, in particular, in AS-nominals.

The remainder of this chapter is devoted to discussing the properties of English $\text{C}_{\text{N}[	ext{V}]}$ functors. More specifically, section 4.3 is devoted to an overview of the relevant functors for English, and providing preliminary evidence for the non-existence of a zero realization for $\text{C}_{\text{N}[\text{V}]}$, i.e. no zero-nominal suffix. It further critically reviews the claim, put forth in Grimshaw (1990) as well as in Marantz (2000), that the presence of $\text{ING}_{\text{N}[\text{V}]}$ always corresponds to an AS-nominal. In section 4.4, I provide evidence for the claim that the functor $\text{ING}_{\text{N}[\text{V}]}$ is atelic, or more specifically homogeneous. Section 4.5, on the other hand, provides evidence for the exclusion of $\text{ING}_{\text{N}[\text{V}]}$ in all contexts which bar an Originator, typically but not only stative. A formal characterization of the properties of $\text{ING}_{\text{N}[\text{V}]}$ is in section 4.6. In section 4.7, the semantic properties of $\text{ING}_{\text{N}[\text{V}]}$ are shown to account for the distribution of Particle Shift and offer a significant insight into the exclusion of Raising within AS-nominals. A comparison between $\text{ING}_{\text{N}[\text{V}]}$, gerundive ing ($\text{ING}^{\text{GER}}$) and progressive ing ($\text{ING}^{\text{PROG}}$) is undertaken in section 4.8, with the conclusion that while $\text{ING}_{\text{N}[\text{V}]}$ may share some properties with the progressive, $\text{ING}^{\text{GER}}$ is altogether a horse of a different color. An overview is given in section 4.9. In Chapter 5, armed with the conclusions reached in this chapter, I return to Short AS-nominals, of the raising and the non-raising varieties.

### 4.3 English Nominalizing Suffixes—Preliminaries

Grimshaw (1990), in attempting to attribute the properties of AS-nominals to the properties of the affixes used and in rejecting inheritance from the verb makes the following claim:

\[(50) \quad \emptyset (R); \text{ATK} (R, E_v); \text{ING} (E_v)\]

Specifically, if $\emptyset$-nominalizers assign $R$ exclusively, they are by definition excluded in AS-nominals. Similarly, if ING-nominalizers only take $E_v$ as their external argument, they are by definition excluded as R-nominals (in our sense). ATK nominalizers, on the other hand, are expected to occur in both contexts.

In what follows I take the claim in (50) as my starting point. I will suggest that the generalization concerning $\emptyset$-derived nominals is empirically fundamentally correct, and that indeed, they cannot occur in the context of AS-nominals. The reason, as it will turn out, has little to do with the properties of the affix itself. In actuality, I will suggest English does not have any nominalizing $\emptyset$-affix, and so-called “$\emptyset$-derived” (de-verbal) nominals are altogether underived. As AS-nominals crucially require the existence of a concrete verb within them, it emerges that such nominals cannot be
AS-nominals. The matter here will turn out to be essential to the nature of categorization, and hence central to all claims about the interaction of syntax and word formation. These are all matters that I return to in great detail in Chapters 6 and 7. For our purposes here, it suffices to show that with few exceptions, and as Grimshaw argues, nouns which show a $\emptyset$-alternation with verbs do not enter the formation of AS-nominals. This would allow us to exclude them from further consideration in this chapter as well as in Chapter 5, although their properties are discussed in some detail in Chapter 7.

I will further endorse Grimshaw’s (descriptive) claim concerning the availability of ATK in both R- and AS-nominal contexts. More specifically, and because ATK is a set of possible realizations for what is otherwise the pure syntactic C-functor $C_N[v]$, ATK will turn out to be entirely indifferent to all matters concerning its environment, short of those involving the satisfaction of its CCS and issues of phonological selection that might determine its actual realization in some local contexts (see Chapter 6, section 2 for discussion). Not only is it, then, compatible with both AS-nominals and R-nominals, it is also compatible with any event type that might be embedded under it. Not so, as we shall see, ING$N[v]$. While I will show that Grimshaw is incorrect in assuming that ING$N[v]$ must be an AS-nominal (complex event nominal, in her terms), I will nevertheless suggest that it has semantic properties which exceed those of a pure $C_N[v]$, and which will result in a considerable impact not only on the properties of AS-nominals, as will be discussed shortly, but also on R-nominals and Synthetic Compounds, a matter that I return to in great detail in Chapter 12.

4.3.1 On the non-existence of “$\emptyset$-Derived” nominals, preliminary

Focusing first on the distinction between (presumed) $\emptyset$-nominalizing suffixes and the others, Grimshaw notes the surprising limitations on argument structure for $\emptyset$-nominals. This, in her system, follows from the fact that $\emptyset$-nominalizing affixes are, by assumption, unable to select Ev as an external argument, and hence cannot head a complex event nominal.13 The relevant effects are in (51)–(52), and are, to my mind, extremely robust. In spite of some counter-examples, note that not only are all the nouns here “homophonous” with a verb, but they also clearly denote an event (a simple one, in the sense of Grimshaw). Nonetheless, arguments and event modification within the nominal are impossible:

(51)  
  a. John’s walk (*of his dog)  
  b. Mary’s ride (*of her horse)  
  c. Kim’s kiss (*of Dennis)  
  d. Peggy’s return (*of the library books)

13 Cast in present-day terms, we could say that for Grimshaw (1990), a nominalizer that assigns $R$ may spell out as $\emptyset$, but not so a nominalizer which assigns $Ev$. 
a. *the walk of the dog for several hours [transitive reading]
b. *the frequent ride of the horse
c. *the kiss of the cross in order to obtain absolution
d. *the return of the library books by Peggy

And see also:

te the stand, the dance, the look, the think, the listen, the (careful) read, the jump,
the drive, the turn, the stroll, the view, the wag, the regard, the order, the
command, the roll, the serve, the hit, the smile, the laugh, the frown, the twist,
the fall, the drop, the move, the buy (out), the look, the break, the cross, the dive,
the fade, the glow, the hire, the jive, the kill, the meet, the need, the open, the pay,
the push, the rest, the stir, the tag, the yank, (deserve) a listen . . .

As (54)–(55) illustrate, with the addition of \(\text{ING}_N[V]\), these restrictions vanish:

a. John’s walking of his dog
b. Mary’s riding of her horse
c. Kim’s kissing of Dennis
d. Peggy’s returning of the library books

In Chapter 7 I will argue against the existence of \(\emptyset\)-categorizing affixes in
English in general, and \(\emptyset\)-nominalizers in particular, and for the underived, indeed,
mono-morphemic nature of the nouns in (51) as well as the verbs they correspond
to. As such, then, these are not AS-nominals, nor can they be assumed to include
a verbal constituent within them. I therefore set them aside here and in the next
chapter, focusing on AS-nominals.14

4.3.2 \(\text{ING}_N[V]\) nominalizers: Are they always AS-nominals?

Turning now to ING on the one hand, and ATK on the other hand, the distinction
between them postulated by Grimshaw (1990) is intended to capture the restriction
against the raising of “Internal” arguments to the prenominal position in AS-ING
nominals already noted in section 4.2 (cf. (33), repeated here, and related discussion):

14 There are, in actuality, cases of AS-nominals corresponding to an attested verb, but nonetheless
morphologically unmarked, and including, at the very least, use (as well as abuse and misuse), change,
release, decline, discharge, resolve (and possibly dissolve), and dissent (as well as possibly assent). Such cases
are used by Newmeyer (2009) to challenge, across the board, the typology offered by Grimshaw or any
attempt to systematize the properties of derived nominals, although he does concede that the generalization
holds in the majority of cases, for what he proposes are historical reasons. A handful of additional
cases are cited in Harley (2009b). I return to these cases in section 3.3 of Chapter 7. For some relevant
methodological comments, as well as for some general comments on exceptions in morphology, see the
appendix to Chapter 6.
The ungrammaticality of (56b) is specifically associated with the nature of the pre-nominal constituent. The asymmetry disappears when the pre-nominal constituent is the understood subject, as illustrated by (57c–d), as well as when the logical object is post-nominal, regardless of whether the logical subject is missing or is expressed by means of a by-phrase, as illustrated by the grammaticality of (57a–b):

(57)  a. the formation of the committee (by the court)
   b. the forming of the committee (by the court)
   c. John’s forming of the committee
   d. Jane’s formation of the committee

The contrast in (56) follows, Grimshaw suggests, if we assume the respective selection properties of ING_{N[V]} and ATK given in (50), alongside the assumption that external arguments never raise to pre-nominal positions in AS-nominals (her complex event or EV nominals). Rather, in, e.g., (57c–d), the pre-nominal arguments are, she assumes, free interpretation possessors, which are interpreted as agents because the eventive interpretation of the entire nominal favors such an interpretation. It thus emerges that (56a) could not be an EV nominal. The pre-nominal DP, by definition, is not an argument associated with the event, but a free possessor. However, internal arguments are obligatory in event nominals. It therefore follows that if (56a) were an EV nominal, it would be ungrammatical. As it is grammatical, Grimshaw concludes that it is an R-nominal, rather than an EV nominal. In contrast with ATK—which are ambiguous between an EV reading and an R reading—ING_{N[V]}, Grimshaw reasons, only has an EV reading. Thus (56b) cannot be an R-nominal and must be an EV nominal. As an EV nominal, however, it is ill formed, due to the absence of the internal argument, thereby giving rise to ungrammaticality.

Grimshaw’s account is thus based on the following claims:

(58)  a. ATK assigns both EV and R.
   b. ING only assigns EV.
   c. Pre-nominal DPs are not event arguments but possessors.
   d. In contrast with propositionally realized events, external arguments are optional in EV nominals.

A number of problems have frequently been noted in connection with the statements in (58). First, note the grammaticality of (59):

(59)  a. Lebanon’s deliberate bombardment for two weeks by the air force in order to utilize a surplus of obsolete ammunition
   b. Rome’s frequent invasion for several centuries by nomadic hordes in order to undermine its European hegemony

The nominals in (59) obey a number of Grimshaw’s important characteristics for EV nominals. The by-phrase is argumental and a purpose clause is possible, aspectual

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15 See Borer (1991/1993) and Doron and Rappaport (1991), as well as Alexiadou (2001), i.a.
modification is possible, as is modification by frequent without plurality, etc. If, indeed, (59a–b) are R-nominals, little remains of the original classification to justify the typology to begin with. Wishing to save Grimshaw from herself, so to speak, it would appear far preferable to allow the pre-nominal DP to be an argument of an event, and the nominals altogether to be $\mathcal{Ev}$ nominals, or the entire rationale for the event/reference distinction on which our analysis, as well as Grimshaw’s, is based evaporates.

A second, less frequently noted problem for the claims in (58) is illustrated by the nominals in (60)–(62):

(60) “Women are reared not to feel competent or gratified by the questing, the competing, the outbidding that collecting…demands.” (S. Sontag, Volcano Lover, p. 138)

(61) a. yesterday’s friendship/ behavior/ love/ music/ clarity/ event/ happiness/ class
   b. the summer’s destruction/ transmission/ deferral/ deferment/ adherence/ attainment
   c. this month’s (unexpected) fighting/ fraternizing/ parenting/ bidding/ bullying/ craving/ viewing/ sinking [ambiguous]/ breaking [ambiguous]/ growing [ambiguous]

(62) this was a type of (new) fighting/ fraternizing/ parenting/ bidding/ bullying/ craving/ viewing/ sinking [ambiguous]/ breaking [ambiguous]/ growing [ambiguous]

Quite apart from the fact that the ING nominals in (60) as well as in (61c) do not have complements, as they would be expected to have were they cases of AS-nominals, Grimshaw herself suggests that the presence of a prenominal temporal expression, as in (61), is a test for R-nominals. Nor can it be claimed that in any of these cases we are dealing with some sort of truncated gerund. In addition to the presence of a definite article in (60) and the availability of an adjective in (61c) and (62), gerunds are straightforwardly ungrammatical in the relevant contexts, as (63a–b) show:

(63) a. *yesterday’s fighting the enemy/ parenting the baby/ outbidding Jamie/ bullying the neighbor/ craving sugar…
   b. *this was a type of fighting the enemy/ parenting the baby/ outbidding Jamie/ bullying the neighbor/ craving sugar…

And so, it appears that at the very least in the contexts in (60)–(62), ING-derived nominals are perfectly comfortable as R-nominals, occurring bare and, as (64) shows, failing to license many of the salient properties of AS-nominals:

(64) a. yesterday’s (unexpected) outbidding (*in order to undermine the new trader)
   b. this year’s (new) craving (*for several months)
   c. this is a type of (recent) bullying (*in order to make up for low self-esteem)
For the sake of completeness, we note that, as such, these ING nominals differ from cases of object deletion in generic present tense cases (“dispositional” cases, in the sense of Mittwoch 2005), where event properties are retained:

(65)  a. The army terrorizes in order to intimidate.
     b. Guy bullies in order to make up for low self-esteem.

We conclude that the claim that ING nominals are always complex event nominals, in Grimshaw’s terms, or, in our terminology, that they always are AS-nominals and hence always entail functional event structure, cannot be maintained as such, nor can it be maintained (cf. Grimshaw 1990) that instances of R-ING nominals, to the extent that they do exist, are all listed exceptions rather than the reflection of a productive process. The considerable productivity illustrated by the presence of such ING nominals in (60)–(62) provides clear evidence that the phenomenon goes well beyond listed exceptions.16

In the remainder of this chapter, and wishing to focus on a comparison of the properties of AS-ING nominals and AS-ATK nominals, the properties of R-ING nominals will be set aside. The matter is, however, taken up again in some detail in Chapter 12 in the context of the analysis of Synthetic Compounds, where the specific semantic properties of ING, otherwise a C-functor, are discussed, and where it is argued that the very same semantics guides the occurrences of ING in AS-ING nominals, in R-ING nominals, and in Synthetic Compounds.

We turn, now, to a detailed comparison between AS-ING nominals and AS-ATK nominals and to the documentation of the differences between them, differences that will be guiding much of the discussion in the remainder of this chapter as well as in Chapter 5, and which will, ultimately, also account for the contrast in (56).

16 The existence of R-ING nominals runs afoul not only of Grimshaw’s (1990) claim, but also of many subsequent accounts which likewise subscribe to the view that, however derived, ING nominals always entail a grammatical event, an approach already noted briefly in Chapter 2. Thus van Hout and Roeper (1998) explicitly assume that ING must merge with Voice and T and thereby must contain full aspectual structure. Marantz (1999, 2000), as well as Alexiadou (2001), propose to derive AS-ATK nominals by embedding them under event structure. ING nominals, on the other hand, represent the spellout of \( \text{n} / \text{ing} \), conditioned by merger with \( \nu \) or Voice and are therefore perforce AS-nominals. In a later execution, more in line with Borer (1999b) and subsequent work, Alexiadou and Grimshaw (2008), as well as Alexiadou (2009), assume that both (AS)-ING and (AS)-ATK merge above grammatical event structure. However, in an effort to give a unified account to ING in verbal gerunds and in ING nominals, they also claim that in both, the merger of ING entails the merger of Voice, effectively forcing ING nominals to be AS-Nominals. Guided by a similar desire to unify the treatment of ING across gerunds and derived nominals, Sichel (2010) assumes that ATK only license a single event but ING, in both gerunds and nominals, licenses a “complex” event, i.e. an event with a subordinate sub-event. Within that execution as well, ING nominals must be AS-nominals.

That ING nominals cannot be AS-nominals across the board is, in turn, conceded by Harley (2009b), as a result of the patently obvious fact that the claim is summarily incompatible with the properties of ING Synthetic Compounds, a matter I return to in Chapter 12. That any attempt to unify the gerundive and the nominal occurrences of ING is altogether misguided should emerge directly from the discussion in section 4.7.1 below.
4.4 AS-ING Nominals are Homogeneous; AS-ATK Nominals need not be

Following the general line of argumentation first introduced in Bach (1986), suppose we consider “homogeneity” to be the equivalent, within the domain of events, of atelicity, or more specifically, non-quantity. If, indeed, ING$_{N[V]}$ is homogeneous (and hence “dense”, in the sense of Roy 2006, 2013), and if, furthermore, its properties as such constrain the event structure that may occur in its scope, then we expect the event structure which emerges in AS-ING nominals to be non-quantity, i.e. atelic.

That AS-ING nominals must be atelic is a conclusion already reached by Snyder (1998) as well as by Alexiadou (2001) (and see also van Hout and Roeper 1998 for relevant discussion). Evidence showing that AS-ING only occurs in the context of non-quantity, atelic events is further discussed in Borer (2005b), where it was argued to be an anti-telicity operator, of sorts. More specifically, suppose we assume, subject to a more precise formulation to be undertaken in Chapter 12, that ING$_{N[V]}$, itself with the property of homogeneity, is incompatible with ASP$_{Q}$, and as a result, it is incompatible with any event consisting of quantifiable divisions occurring in its scope. Furthermore, and as we shall see, ING$_{N[V]}$ entails the existence of an Originator. In combination with its homogeneity, this means, effectively, that ING$_{N[V]}$ may not occur, for example, in the context of psych-predicates, or be stative. By having these two properties it comes, of course, extremely close (although still diverges from) ING$_{PROG}$, but shows radical difference from the properties of gerundive ING$^{GER}$, a matter I return to in section 4.7.17

By way of evidence for the atelicity of AS-ING nominals, consider the modification possibilities of the AS-nominals in (66)–(67) (and see directly below on gradually and twice):

(66)  
a. Kim’s (*gradual) formulating of several procedures {for the past few weeks/*in a few weeks/??twice}  
b. Pat’s (*gradual) forming of many committees {for three months/*in three months/??twice}  
c. Robin’s (*gradual) dissolving of these chemicals {for three hours/*in three hours/??twice}  
d. Inny’s (*gradual) writing of the letter {for three hours/*in two hours/??twice}

(67)  
a. Kim’s (gradual) formulation of several procedures {twice/in two weeks}  
b. Pat’s (gradual) formation of many committees {twice/in two minutes}  
c. Robin’s (gradual) dissolution of these chemicals {twice/in two hours}

It is well established that expressions such as for-x-time are only compatible with non-quantity events. It is worthwhile to digress briefly, however, and consider the properties of modifiers such as gradual and in-x-time within event structure.

17 Note, specifically, that I assume that ASP$_{Q}$ cannot merge in the scope of ING$_{N[V]}$. This is not the case for ING$^{PROG}$. ASP$_{Q}$ may, and indeed routinely does, merge in the scope of ING$^{PROG}$, with the latter acting as an operator canceling culmination. In contrast, ING$_{N[V]}$ is not an operator on ASP$_{Q}$, but rather excludes its merger altogether. The empirical foundation of this claim should become clear enough from the ensuing discussion, and especially from the comparison with the progressive undertaken in section 4.7.2.
Piñon (2000) shows that gradually (and thus presumably gradual as well, at least in some contexts) is a marker of scalar structure. Scalar structure, in turn, is a necessary (but not sufficient) condition for quantity structures. Insofar as the impossibility of gradual for the cases in (66) indicates that $ING_{N[V]}$ is incompatible with scalar structure, perforce it is incompatible with quantity as well. In Borer (2005b), I argue that gradually, just like in-x-time expressions, modifies quantity (or scalar) structures which are otherwise assigned range (e.g. by a direct object).18

This, however, is not the case for expressions such as once, twice, or three times, which, as I argue in Borer (2005b), are themselves capable of assigning range to an open value to give rise to a projecting ASP and hence induce a quantity reading. Thus consider the paradigms in (68)–(72). Predicates such as touch, smell, feel, allow, in principle, either an Originator or an Involuntary Experiencer, of some sort, an ambiguity that is typically resolved by context and the choice of subject (cf. (68)–(69)). If, however, twice is added, the Involuntary Experiencer reading disappears, and as a result, a non-animate subject is strongly dispreferred. Furthermore, in the presence of twice, modifiers of atelic structure, otherwise felicitous, are ruled out and quantity modification such as in-x-time is licit:19

(68) a. The wall touched the fence (for two years) (#in two minutes)
   b. I smelled my neighbors smoke in my bedroom (for several hours) (#in two minutes)
   c. Dennis felt the (weight of his) coat on his shoulders (for some hours) (#in two minutes)

(69) a. Kim touched the fence (in/for two minutes)
   b. Robin smelled the stew (in/for two minutes)
   c. Dennis felt the material with his fingers (in/for few seconds)

(70) a. (#)The wall touched the fence twice (in two days/*for two years)
   b. Kim touched the fence twice (in two years/*for two years)
   c. Robin smelled the stew several times (in the past few hours/*for the past few hours)
   d. Dennis felt the coat on his shoulders once (in the past few minutes/*for the past few minutes).

18 This is in contrast with, e.g., Schein (2002), who argues that it is the relative scope of adverbial modification that gives rise to quantity effects. See Borer (2005b) for some discussion of this matter as well as for a fuller discussion of quantity modifiers and quantity assignors, respectively.

As already noted in Chapter 3 (fn. 3), evidence from Hebrew shows that in-x-time expressions cannot be taken to induce quantity readings either, contra Higginbotham (2009).

19 The duration of the adverbial, under the relevant reading, refers to the cumulative duration of all occurrences, suggesting that in the presence of expressions such as once or three times, what is under consideration might be a combined event that consists of subparts, each of which is an atomic event of the same kind (i.e. the combined event of touching the fence twice). A distinct reading is available, e.g. for (70b), whereby there are two distinct atelic events of fence touching, each lasting two years. This reading is set aside here.

20 The `came to feel the weight in two minutes' interpretation is excluded. See fn. 3 of Chapter 3 for a relevant comment.
Evidence that *twice* and similar are specifically range assignors to \(\text{ASP}_Q\) and thus cannot be treated as modifiers also emerges from the contrasts in (71)–(72). Here, an activity predicate rejects quantity modifiers such as *in-x-time* but allows *twice*. And as above, in the presence of *twice*, *in-x-time* becomes licit, and *for-x-time* excluded:

(71)  
- a. Danique laughed (*in ten minutes)  
- b. Sanne ate (*in ten minutes)  
- c. Eliza lived in Paris (*in ten months)  

(72)  
- a. Danique laughed twice (in ten minutes)  
- b. Sanne ate four times (in two days)  
- c. Eliza lived in Paris twice (in ten years)  

We now have a direct explanation for the unavailability of *twice*-type expressions in \(\text{ING}_N[V]\) nominals. If indeed *twice* assigns range to \(\text{ASP}_Q\), and if, indeed, \(\text{ING}_N[V]\) directly blocks the merger of \(\text{ASP}_Q\) in its scope, then *twice* and \(\text{ING}_N[V]\) are predicted to never co-occur, a prediction which is verified.

The facts in (66)–(67) can further be augmented by the ungrammaticality/oddity of (73)–(74). The nominalizations in (73) (transitive) and (74) (intransitive) are of so-called achievement verbs, which do not allow a non-quantity construal. As such, we expect them to be incompatible with AS-ING nominals, which is directly confirmed by (73)–(75):21

(73)  
- a. *Kim’s reaching of the summit  
- b. *Pat’s ending of the flood  
- c. *Robin’s finding of (the) oil  
- d. *The bulldozer’s hitting of (the) bedrock  

(74)  
- a. *the arriving of the train (at 5pm)  
- b. *the erupting of the argument  
- c. *the exploding of the balloon  
- d. *the disappearing of the rabbit  

(75)  
- a. *the train’s (prompt) arriving (at 5pm)  
- b. *the argument’s (sudden) erupting  
- c. *the balloon’s (noisy) exploding  
- d. *the rabbit’s (mysterious) disappearing  

[adjectives to exclude gerundive construal]

21 In Borer (2005b, 2010), I analyze achievements as complex expressions which contain a covert locative that anchors a sub-event headed by \(\text{ASP}_Q\). For that reason, achievements must be quantity, regardless of the quantity specification of any arguments, and thereby giving rise to the contrasts between (73)–(75) on the one hand and (76)–(77) on the other. Monadic predicates which do not come with such independent binders of \(\text{ASP}_Q\), meanwhile, display a variable behavior, and are thus, in principle, ambiguous between a quantity structure (and requiring a quantity DP merging with \(\text{ASP}_Q\)), or a non-quantity structure, with DP merging with \(E\), and interpreted as an *Originator*. 
The ungrammaticality of (74)–(75) is in contrast with the minimally distinct but nonetheless fully grammatical (76)–(77), likewise AS-nominals, but with an ATK nominalizer.\textsuperscript{22}

\begin{enumerate}
\item the arrival of the train
\item the eruption of the argument
\item the explosion of the balloon
\item the disappearance of the rabbit
\end{enumerate}

\begin{enumerate}
\item the train’s arrival
\item Vesuvius’ eruption
\item the balloon’s explosion
\item the rabbit’s appearance
\end{enumerate}

We note, in this context, the grammaticality of the paradigm in (78), with nominals based on verbs sometimes lexically classified as unaccusative:

\begin{enumerate}
\item the sinking of the ship [intransitive]
\item the falling of the leaves [intransitive]
\item the moving of the planet [intransitive]
\item the twisting and turning of the yarn [intransitive]
\end{enumerate}

The verbs in (78), in turn, are so-called “variable behavior verbs”, amply discussed in the literature (cf. Perlmutter 1978; Van Valin 1991; as well as Levin and Rappaport-Hovav 1995), and shown to oscillate between the diagnostics of unaccusatives and unergatives. In addressing this matter in Borer (2005b), I argue that verbs, as such, are never specified as “unaccusative” or “unergative”, but rather unaccusativity is a property of monadic quantity predicates. In turn, and with the exception of achievements (cf. fn. 21), all so-called unaccusative (and accomplishment) “verbs” in actuality exhibit variable behavior. Their argument may merge either with ASP\textsubscript{0} to give rise to quantity and unaccusative diagnostics, or alternatively, it may merge with E where it would be interpreted as an Originator and where, in the absence of independent quantity range assignors, a non-quantity, activity reading would emerge. When turning to the cases in (78), and especially given the contrast between their grammaticality and the ungrammaticality of the cases in (73)–(75) the direct conclusion would be that these are not cases of unaccusativity or quantity, but rather cases of activity predicates, correlating directly with the grammaticality of the parallel clausal cases in (79). We note further that non-quantity modification is entirely

\textsuperscript{22} Note that the pattern of judgments in (74)–(77) further casts serious doubt on the claim (e.g. in Grimshaw 1990; Marantz 1997; Alexiadou 2001) that pre-nominal DPs in AS-nominals in English are free interpretation possessors. If that were the case, the convergence of judgments between pre- and post-nominal subjects would be a coincidence.

For some relevant discussion of some of these contrasts, see Pustejovsky (1995). The ungrammaticality of the nominals in (73)–(75) cannot be reduced to some sort of a blocking effect from the forms in (76)–(77), given the well-formedness of pairs such as formation-forming, formulation-formulating, survival-surviving, adherence-adhering, sensation-sensing, and many others, which may co-occur in similar environments and with little interpretational difference.
compatible with the cases in (78), as (80) shows. By way of completing the argument, we note that the clausal correlates of (73)–(75) are illicit in non-quantity clausal contexts, as (81) shows. Equally important is the observation that progressive, insofar as it may occur with achievements, gives rise to an anticipatory reading, not to a continuous reading, as is normally the case (and see section 4.7.2 for a detailed comparison between nominal ING_{N[V]} and ING_{PROC}):

(79) a. The ship sank for several hours but it was rescued before it reached bottom.
   b. The asteroid fell through the atmosphere for a while and then was ejected into space as a result of a missile explosion in its vicinity.
   c. The planet moved for millions of years before Ender evaporated it.
   d. I twisted and turned for long minutes in my chair, unable to answer.

(80) a. the sinking of the ship (for several hours) [intransitive]
   b. the falling of the asteroid through the atmosphere for several seconds
   c. the moving of the planet for millions of years [intransitive]
   d. the twisting and turning of the candidates (for long minutes) [intransitive]

(81) a. *The train arrived for several hours but it never made it to the station.
   b. *The argument erupted for several hours.
   c. *The balloon exploded for several seconds.
   d. *The rabbit appeared for several hours. [excluding stage performance reading]

(82) a. As the train was arriving, it was intercepted and stopped.
   b. My team was winning when I left! What happened???
   c. Go in quick! An argument is erupting which we need to stop!
   d. Don’t leave! The rabbit is (finally) appearing!

As a final piece of evidence for the non-quantity, homogeneous nature of AS-ING nominals, consider the observation, due to Mourelatos (1978), that while telic derived nominals (may) behave as count nouns, atelic ones must behave like mass. In view of that observation, consider the following contrasts:23

(83) a. the (regrettable) dismissals/*dismissings of many qualified workers (by newly appointed CEOs)
   b. the (infrequent) empowerments/*empowerings of under-represented groups (by their elected officials)

23 Grimshaw (1990) argues that AS-nominals (complex event nominals) are always singular. The claim in Mourelatos (1978) as well as the grammaticality of the plural examples in (83)–(84) indicate, first, that AS-nominals are possible as plurals, and furthermore, that the relevant distinction cannot be singular/plural, but is rather mass/count. Specifically, note that the nominals with the count singular determiner in (84) are just as bad, in atelic contexts, as the plural ones.

Ironically, the contrast which Mourelatos himself cites as evidence for his own claim is that which exists, putatively, between (ia) and (ib), both involving ING. To the extent that capsizing can pluralize (which quite a few speakers dispute), it is a counter-example to the claim that ING_{N[V]} is an atelic operator.

(i) a. three capsizings of the boat
   b. *three paintings of the Nativity [with the event reading]
c. the (gradual) promotions/*promotings of these incompetent functionaries (by their superiors)

d. the (frequent) replacements/*replacings of many humans with few machines (in thirty years)

e. the appointments/*appointings of three musicians to permanent positions (by the management)

f. the dispossessions/*dispossessings of rural land owners (by the military authorities)

(84) a. a dismissal /*a dismissing of a qualified worker (by newly appointed CEOs)

b. an empowerment/*an empowering of an under-represented group (by its elected official)

c. a promotion/*a promoting of an incompetent functionary (by his superior)

d. a replacement/*a replacing of a worker with a machine

e. an appointment/*an appointing of a musician to a permanent position (by the management)

The effects here are, across the board, extremely clear and very robust, suggesting a distinct semantics for ING, associated specifically with the absence of quantity interpretation, and thus homogeneity. In Chapter 12, I will show that similar effects obtain for R-ING nominals as well as for Synthetic Compounds with ING.

4.5 AS-ING Nominals Entail an Originator; AS-ATK Nominals need not

Event-related functional projections do not need to introduce arguments within the model assumed here—rather, they introduce events (through E) or modifications of events (through ASP). An event need not originate with an argument (e.g. it rained, Mary fell), nor does ASP need to be associated with one (e.g. the army took over). But on the other hand, if a DP (or its copy) is not semantically vacuous (i.e. it is not an expletive) and if it merges as the specifier of an aspectual node, its merger in that position will entail an interpretation as a particular participant in the event.

24 Specifically, a DP in Spec,ASP is interpreted as Subject-of-Quantity (in essence, an undergoer of quantifiable change) and a DP in the specifier of a non-stative E, if it does not have any other role, will be interpreted as an Originator of the event (and see Chapter 2, section 3 for a fuller discussion of the event structure assumed). An investigation of AS-ING nominals, in this context, reveals that they are not only homogeneous, but that they also specifically force the presence of an understood (overt or covert) Originator, thereby effectively excluding true stative readings. By way of evidence, consider the occurrence, in clausal contexts, of verbs such as love, feel, touch, sense. As already noted, these are typically ambiguous between an

24 We note, in this respect, that the only event structure related node which introduces an event participant, as such, is FSHL, and that this is, in fact, its sole function—it neither contributes to the event interpretation, nor does the participant thus emerging function as an event modifier in any direct sense.
Originator and an Experiencer reading, with world knowledge situations sometimes strongly favoring one over the other (cf. 85). In the AS-ING contexts in (86)–(87), however, only the Originator-oriented, non-stative readings are available, giving rise to the anomaly of (86d) and (87d):25

(85) a. Dennis felt the coat [Involuntary Experiencer; Originator]
   b. Jenny smelled the stew [Involuntary Experiencer; Originator]
   c. Corrine touched Gil [Involuntary Experiencer; Originator]
   d. The wall touched the fence [Involuntary Experiencer; Originator]

(86) a. The feeling of {*the cold/the coat on his shoulders} (by Dennis) [Originator only]
   b. The smelling of the stew (by Jenny) [Originator only]
   c. The touching of Gil (by Corrine) [Originator only]
   d. The wall’s touching of the fence (*by the wall) [Originator only]

(87) a. Dennis’ feeling of {*the cold/the coat on his shoulders} [Originator only]
   b. Jenny’s smelling of the stew [Originator only]
   c. Corrine’s touching of Gil [Originator only]
   d. *the wall’s touching of the fence [Originator only]

Similar effects emerge when we embed ambiguous psych/eventive predicates under ING:26

(88) a. John irritated the cats. a’. The clarinet irritated the cats.
   b. Mary annoyed the children. b’. The noise annoyed the children.
   c. The cats pleased Alexis and Bettina. c’. The music pleased Alexis and Bettina.

(89) a. John’s irritating of the cats a’. *the clarinet’s irritating of the cats
   b. Mary’s annoying of the children b’. *the noise’s annoying of the children
   c. the cats’ pleasing of Alexis and Bettina c’. *the music’s pleasing of Alexis and Bettina.

(90) a. the irritating of the dogs [Originator only]
   b. the annoying of the children [Originator only]
   c. the pleasing of Alexis and Bettina [Originator only]

25 All * assigned for readings associated with normal world circumstances. Coercive readings (#) are only marked when contrastive. Presumably, however, all cases here are licit if one is willing e.g. to concede volitional action to walls and similar, or an ability to actually manipulate coldness by touch.

The terminology of Originator and Involuntary Experiencer is opted for here, rather than eventive/stative, precisely because the nature of roles associated with stative events is neither clear nor necessarily uniform. As what is under consideration, specifically, is the Originator entailment associated with $\operatorname{ING}_{\text{N-V}^V}$, that is the specific contrast that is being highlighted. It goes without saying that insofar as some event structure is associated with the non-Originator cases, that event structure does involve specific role assignment for arguments, if present. The specifics of that structure, however, are not pursued.

26 Minimal pairs with ATK nominals are not available for independent reasons. Thus irritation, annoyance, and pleasure, if AS-nominals, have altogether different argumental configuration, allowing an Experiencer subject exclusively. See Pesetsky (1995) for some seminal discussion.
When we turn to straightforward stative predicates, we find that minimal pairs with ATK nominalizers are easy to find, and that they confirm the generalization:

(91) a. the plant’s (persistent) adherence/*adhering to the fence
    b. Guy’s (definitive) knowledge/*knowing of all the answers
    c. Ava’s (patient) endurance/*enduring of the noise
    d. the stain’s (sad) resistance/*resisting to cleaning

A final piece of evidence confirms that the restriction is, indeed, on the availability of an Originator, and not, e.g., against stativity as such. Thus consider the ungrammaticality of AS-ING with weather verbs, clearly not stative:

(92) a. *It’s (constant) raining in Utrecht (for months)
    b. *It’s (rare) snowing in Paris (for several hours)
    c. *the (constant) raining in Utrecht (for months)
    d. *the (rare) snowing in Paris (for several hours)

In Chapter 12, I discuss the effect which the properties of $\text{ING}_{N[V]}$ have in the context of R-ING nominals and Synthetic Compounds.

4.6 Accounting for Particle Shift Effects in AS-nominals

Having put together a description of the properties of $\text{ING}_{N[V]}$, what emerges, rather directly, is an account for the absence of Particle Shift in AS-ING nominals, most recently discussed by Harley and Noyer (1997) and by Sichel (2010) (relevant facts repeated in (93)–(94)):

(93) a. Kim wrote up the letter.
    b. Kim wrote the letter up.

(94) a. Kim’s writing up of the letter
    b. *Kim’s writing of the letter up

As is well established, English particles contribute to the emergence of a telic reading in contexts that are otherwise ambiguous, as is illustrated by the contrast between (95) and (96):

(95) a. Mary ate that turkey for seven days before she threw it away.
    b. I wrote that letter and wrote it and wrote it, and I am still not happy.

27 Typically, it is assumed that the ungrammaticality of (92) stems from the impossibility of expletive subjects in nominals. That, however, is an independent stipulation. In turn, and given the fact that weather verbs are nominalized with ING, this fact can now be derived.

To complete the picture we note that the only other expletives occurring in English do so in the context of adjectives and auxiliaries. Under the straightforward assumption that auxiliaries are independently blocked in AS nominals, representing either $T$ or $g$-$\text{ASP}$, these are independently blocked as derived nominals. There thus remains little reason to exclude expletives in nominals by an independent statement.
(96)  a. *Mary ate that turkey up for seven days before she threw it away.
    b. *I wrote that letter up and wrote it up and wrote it up, and I am still not happy.

Consider now the cases in (97a–c):

(97)  a. I was married to an alcoholic who drank up money faster than I could bring it home.
    b. Think of all the times you left your cell phone charger plugged into the wall and it just ate up energy (for hours/all afternoon/*in three hours).
    c. She wrote up letters demanding things be done.

In (97a–c), and in spite of the presence of the particle, the only available reading is atelic, non-quantity. It therefore follows that the particle in itself cannot assign range to ASP_Q. As the object is non-quantity and cannot do so either, the structure is licit only in case ASP_Q fails to merge. It thus emerges that (97a–c) involve the merger of FSHL, and the object is assigned partitive case in its specifier. It further emerges that the particle here cannot be a modifier of ASP_Q nor a range assignor to it, as ASP_Q, quite simply, is not present in the structure.

Minimally contrastive, now, are the cases in (98a–c). Here, we note, with a shifted particle, what emerges is a considerably deteriorated utterance:

(98)  a. ??I was married to an alcoholic who drank money up faster than I could bring it home.
    b. ??Think of all the times you left your cell phone charger plugged into the wall and it just ate energy up (for hours/all afternoon/*in three hours).
    c. ??She wrote letters up demanding things be done.

It thus emerges the “shifted” particles in (98a–c) require the presence of ASP_Q. It further emerges that they cannot assign range to it, but rather must be modifiers as, if they were range assignors, (98a–c) would be fully grammatical. As modifiers, in turn, their behavior is on a par with that of modifiers such as in-x-time. Like such modifiers, they require the presence of an otherwise licit quantity structure (i.e. range-assigned ASP_Q), but are not in themselves capable of licensing such a structure directly. According to this analysis, then, the ungrammaticality of (98) is thus exactly on a par with that of (99) (and see Borer 2005b for fuller details):

(99)  a. *I was married to an alcoholic who drank money in ten days.
    b. *She wrote letters in half an hour. [single event reading]

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28 “drank up money”: 61,500 Google hits; “drank money up”: 3 Google hits; “ate up energy”: 40,300 Google hits; “ate energy up”: 2 Google hits. The generalization observed here concerns, specifically, non-generic statements. Generic statements such as cell phones soak energy up, while not fully grammatical, are nonetheless typically judged as improved, relative to the cases in (98a–c).

Note that expressions such as this should drive prices down for a while are licit, but precisely because down, in this case, may felicitously be interpreted as directional, and need not define an end point. In conjunction with an event where such directional interpretation is difficult (e.g. break down) a directional interpretation is excluded and rather a telicity one is enforced.
We must now provide an account for the fact that the particle in cases such as (97) is clearly allowed to proceed without modifying ASP_Q, but not so in (98a–c). An explanation, however, is directly available if we assume that in (97), but not in (98a–c), the verb-particle combination is effectively a compound, and the grammatical function of UP as a modifier of ASP_Q is thus pre-empted. Verb movement (in this system to some position above ASP_Q or F_SHL) in turn applies to the verbalized constituent. In the absence of compounding, the particle will proceed to be “stranded” behind, where it will be interpreted as a modifier (or a secondary predicate) of ASP_Q. In the case of compounding, however, the particle is not a functor, and its presence is irrelevant to the licensing or the modification of ASP_Q.

Supposing a non-quantity DP as an object, the following derivations emerge:29

(100) Non-quantity:
   a. [E he [T drank+up [money_Q drank+up [C=V π\sqrt{\text{drink}+\up}]]]]
      \hspace{1cm} \text{Participant}
   b. *[E he [T drank [money_Q drink [UP_Q-mod [C=V π\sqrt{\text{drink}}]]]]]
      \hspace{1cm} \text{Participant}

(101) Quantity:
   a. *[E he [T drank+up [money_Q \llangle \text{drink}+\up \rrangle _{\text{ASP}_Q} [C=V π\sqrt{\text{drink}+\up}]]]]
      \hspace{1cm} \text{ACC S-o-Q}
   b. *[E he [T drank [money_Q \llangle \text{drink} \rrangle _{\text{ASP}_Q} [UP_Q-mod [C=V π\sqrt{\text{drink}}]]]]]
      \hspace{1cm} \text{ACC S-o-Q}

Both quantity derivations fail to converge, as there is nothing to assign range to \llangle e \rrangle_{\text{ASP}_Q}. Crucially, recall, aspectual particles such as UP are modifiers, not range assignors, and the DP in Spec, ASP_Q, money, is not a quantity DP. Of the non-quantity derivations, (100b) likewise cannot converge, as in the absence of ASP_Q, UP, a functor, is, so to speak, uninterpretable. The only licit derivation, in the absence of an independent range assignor to \llangle e \rrangle_{\text{ASP}_Q}, then, is one which allows for the compounding of the particle, as in (100a).

When we compare these derivations to those which do have an independent range assignor to \llangle e \rrangle_{\text{ASP}_Q}, e.g. a quantity DP, the following picture emerges:

29 We note, in turn, that if drink up is a compound, then drinking up would appear to present a bracketing paradox. As such, it is rather reminiscent of the bracketing paradox otherwise attested with -ing in so-called Synthetic Compounds, where much evidence is available to favor the parse [truck drive]-ing over the parse [truck] [driving]. I return to some of these matters in Chapter 12.

The specifics of particle structure both in shifted and in compounded contexts are not elaborated on here, nor do I undertake to propose a specific ExP-segment such that it is assigned range by particles, although one, presumably, would be required by the system of Extended Projections developed here. See, however, Chapter 10, section 3 for relevant discussion in the context of plural marking inside compounds. See also Chapter 6, section 4 for some general discussion of prefixes and particles.
Non-Quantity:

a. \(E \text{ he } [\text{ drank } \text{ my money } \text{ drink } \text{ up } \text{ my money }]\)

b. \(*E \text{ he } [\text{ drank } \text{ my money } \text{ drink } \text{ up } \text{ my money }]\)

Quantity:

a. \(E \text{ he } [\text{ drank } \text{ my money } \text{ my money } \text{ drink } \text{ up } \text{ my money }]\)

b. \(*E \text{ he } [\text{ drank } \text{ my money } \text{ my money } \text{ drink } \text{ up } \text{ my money }]\)

Note specifically that both derivations in (103) are licit—while UP must modify \( \text{ASP}_Q \text{ up} \), a non-head member of a compound, need not do so, but the well-formedness of \( \text{ASP}_Q \) is not contingent on such modification, as it is otherwise assigned range by \textit{my money}.

Finally, note that independent evidence for the compounding nature of non-shifted particles is available from the impossibility of modification in such cases, already noted in Jackendoff (1977), and more recently considered in Dehé (2002):

(104) a. I will look the answer right up.

b. He brought the wagon right back.

c. Please shut the gas completely off.

d. We turned the situation partway around.

(105) a. *I will look right up the answer.

b. *He brought right back the wagon.

c. *Please shut completely off the gas.

d. *We turned partway around the situation.

In turn, that the particle and its modiﬁer do, at least sometimes, form a constituent can be seen from the cases in (106) (and contrast with occurrence of the modiﬁer to the right of the particle in (107)):

(106) a. She shut the gas completely off, not partially off.

b. We turned the situation partway around, not all the way around.

(107) a. *She shut the gas off completely, not off partially.

b. *We turned the situation around partway, not around totally.

Armed now with some understanding of the role of so-called shifted particles, (the ones, note, which in actuality do not shift but rather stay put) let us return to \( \text{ING}_{N[V]} \) nominals, where such “shifted” particles are barred. At first sight, it appears that the analysis outlined here for particles is of little relevance, given the fact that in the ungrammatical (94b), the object is quantity. Viewed differently, however, the key to the ungrammaticality of (94b) is the failure of the particle, in its non-compounding merger site, to modify quantity structure in the form of \( \text{ASP}_Q \). The reason \( \text{ASP}_Q \) is absent, here, is not because it couldn’t be locally assigned range by a quantity DP, but rather \( \text{ASP}_Q \) is absent because, as already noted and amply demonstrated, nominal \( \text{ING}_{N[V]} \) not only does not license quantity structure on its own, it positively prevents such a node from merging within its scope altogether. Thus if a non-compounded
(“shifted”) particle must modify $\text{ASP}_Q$, its presence is altogether incompatible with AS-ING nominals, who just won’t let $\text{ASP}_Q$ be. That no effect emerges in the presence of compounded particles, in turn, follows from the fact that non-shifted particles are perfectly happy to exist without a merged $\text{ASP}_Q$, as was already demonstrated by (97). Returning to the structures in (100)–(103), the incompatibility of $\text{ING}_{N[V]}$ with $\text{ASP}_Q$ in conjunction with particles boils down to the wholesale exclusion of (101) and (103). The remaining options, (100a) and (102a), are expected to be licit in AS-ING nominals, and indeed, they are.

Completing the picture, recall that particles, shifted or otherwise, are altogether excluded in AS-ATK nominals, with the relevant cases repeated here from section 4.2:

(108) a. *the addition up of the numbers  
   b. *the growth up of the children [intransitive]  
   c. *the payment up of debts
(109) a. *the addition of the numbers up  
   b. *the growth of the children up [intransitive]  
   c. *the payment of debts up

The exclusion, however, seems to have little to do with the structure of AS-nominals as such, and rather, with the fact that particles, just like ditransitives, appear altogether incompatible with the Latinate vocabulary stock. Thus although $\text{ASP}_Q$ is fully licit in AS-ATK nominals, particles are nonetheless excluded as its modifiers, as are, for that matter, compounding particles. The explanation, thus, is not syntactic, but fundamentally tied in with the realizational possibilities (and see section 4.1.3 for the relevant discussion).

### 4.7 The Other INGs

#### 4.7.1 Gerund ING

Any attempt to draw similarities between gerundive ING ($\text{ING}^{\text{GER}}$) and nominal $\text{ING}_{N[V]}$ is prima facie extremely seductive, insofar as gerunds share the distribution of DPs and like nominals, allow a pre-ing form to be marked as genitive through ‘s. The similarity, it seems, is even stronger if, as I have argued here, $\text{ING}_{N[V]}$ always includes a V constituent and at times even some event structure. While the similarities are certainly intriguing, I believe any temptation to actually equate the two

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$^{30}$ By postulating the hypothetical existence of gerundive ING, $\text{ING}^{\text{GER}}$, we are in fact guilty of generalizing over a number of gerunds which may have very distinct characters (see, for instance, Reuland 1983 as well as Pullum and Zwicky 1999). All instances of $\text{ING}^{\text{GER}}$, nonetheless, do share the absence of the properties we described for $\text{ING}_{N[V]}$, and as we shall see, also the properties $\text{ING}^{\text{PROG}}$ and therefore must be distinguished from both. Insofar as this is the conclusion to be drawn here, it diverges from the conclusion in Pullum and Zwicky (1999), who specifically group $\text{ING}^{\text{GER}}$ with $\text{ING}^{\text{PROG}}$ as “inflectional” ING (and as such, as distinct from our $\text{ING}_{N[V]}$).
morphemes must be firmly resisted (contra recent attempts on the part of Sichel 2010, and Alexiadou 2009), as their semantics turns out to be extremely different. More concretely, while INGₙ[V] comes with some independent semantics, ING GER has none. In fact, ING GER neither adds nor subtracts from the meaning of the event that is embedded under it, and as such, appears to have a solely incremental function, if that. Ironically, as such it also seems to resemble more the ATK nominalizers than INGₙ[V]. More specifically, neither the homogeneous nor the Originator effects we observed with INGₙ[V] are attested, and rather, pace the absence of T and the presence of a presumed D and genitive case in its stead, the behavior of gerunds is identical to that of fuller clauses.31

Considering homogeneity effects first, note that none are attested, and that gerunds are fully licit in the presence of telicity modifiers/assignors such as gradually, twice, or in x hours:

(110)  a. Kim’s formulating several procedures in a few weeks/gradually/twice
     b. Pat’s forming three committees in three months/twice
     c. Robin’s dissolving these chemicals gradually in three hours/twice
     d. Inny’s writing the letter in two hours/gradually

Nor are achievements barred, and note, in contrast with progressives, no anticipatory reading:

(111)  a. Kim’s reaching the summit
     b. Pat’s ending the flood
     c. Robin’s finding oil
     d. the bulldozer’s hitting bedrock

(112)  a. the train arriving promptly (at 5 pm)
     b. the argument erupting suddenly
     c. the balloon’s exploding noisily
     d. the rabbit’s disappearing mysteriously

Turning to the obligatoriness of an Originator, no effects are observed either:

(113)  a. (Dennis’) feeling {the cold/the coat on his shoulders} [Voluntary Experiencer; Originator]
     b. (Jenny’s) smelling the stew [Voluntary Experiencer; Originator]
     c. (Gil’s) touching Corrine [Voluntary Experiencer; Originator]
     d. (the wall’s) touching the fence [Voluntary Experiencer, contextually]

In arguing that ING GER has distinct properties from INGₙ[V], I further disagree with Pustejovsky (1995) and Siegel (1998), who argue for their identity in event contexts, and specifically for the progressive interpretation of both. As I shall proceed to show, INGₙ[V] shares important properties with the progressive, but not so ING GER.

31 Alexiadou (2001) attributes a similar observation to Graham Katz (p.c.), who likewise observes that gerunds may be stative (and involve an Involuntary Experiencer) but not so AS-ING nominals.
(114)  
  a. (John’s) irritating the dogs  
  b. (the clarinet’s) irritating the cats  
  c. (the noise’s) annoying the children  
  d. (Mary’s) annoying the children  
  e. (the cats’) pleasing Alexis and Bettina  

[Involuntary Experiencer; Originator]  
[Involuntary Experiencer, contextually]  
[Involuntary Experiencer, contextually]  
[Involuntary Experiencer, Originator]  
[Involuntary Experiencer, Originator]  

[compare with (89)–(90)]

Similarly (and compare with (91))

(115)  
  a. the plant’s adhering to the fence  
  b. Guy’s knowing the answers  
  c. Ava’s enduring the noise  
  d. the stain’s resisting the cleaning

And finally, no effects whatsoever are observed in weather verb contexts:

(116)  
  a. Raining in Utrecht (for several days) is common.  
  b. Snowing in Paris (for several hours) is rare.  

That no effects are now observed for Particle Shift constructions, as per Chomsky’s (1970) original observation, shouldn’t come as a surprise, given the fact that INGGER clearly does not interact with quantity in any way whatsoever. Rather, what we find is the exact effects we get in clausal VPs:

(117)  
  a. Adding up numbers took my entire weekend.  
  b. Adding up numbers day in day out is certainly a way to spend a lifetime!  
  c. Eating up energy is one of the characteristics of a modern lifestyle.

(118)  
  a. Adding the numbers up took my entire weekend.  
  b. *Adding numbers up day in day out is certainly a way to spend a lifetime!  
  c. *Eating energy up is one of the characteristics of modern lifestyle.  

4.7.2 Progressive ING

That INGGER behaves so differently from ING_N[V] is even more striking in view of the fact that progressive ING (ING^PROG) is actually quite similar to it (and as such, distinct from INGGER), although at least superficially, the differences seem to outweigh the similarities. While the behavior is not identical, it nonetheless converges in entirely non-trivial ways. Importantly, ING^PROG does not project an N category (although the exact category that it does project is not self-evident. See section 5 of Chapter 7 for some discussion). When we turn to its semantic properties, however, we find an important convergence.32 Thus consider first homogeneity. Hardly surprisingly, the very same restrictions occur in the progressive, which has been independently argued to disallow culminations. Just as ING_N[V] had the power to

32 See also Portner (1992); Zucchi (1989, 1993); as well as Pustejovsky (1995); and Siegel (1998).
exclude non-Originator oriented readings and coerce contextually inappropriate cases into an Originator reading, so does ING\textsuperscript{PROG}:\footnote{Note, however, that at least in some of these cases, modification with \textit{gradually} seems better than in AS-ING nominals, again hardly a surprise given the fact that ING\textsuperscript{PROG} does not in actuality exclude the merger of ASP\textsubscript{Q}, but rather cancels its effects by negating culmination.}

(119)  a. Kim was formulating several procedures (*in a few weeks)/(*twice)
       b. Pat was forming three committees (*in a few weeks)/(*twice)
       c. Robin was dissolving these chemicals (*in a few weeks)/(*twice)
       d. Inny was writing the letter (*in two hours)

(120)  a. John is being difficult.
       b. Mary is being a doctor.

Non-Originator psych predicates, likewise, are by and large excluded, as was the case for ING\textsubscript{N[v]}, with disambiguation emerging for psych/eventive ambiguities, although, we note, the effect is at times not nearly as robust as in the case of ING\textsubscript{N[v]}:\footnote{compare with (87)}

(121)  a. Dennis is feeling {??the cold air/the coat on his shoulders}
       b. Jenny is smelling the stew. [strong eventive preference]
       c. Gil is touching Corrine. [strong eventive preference]
       d. (?)The wall is touching the fence. [compare with (87)]

(122)  a. John is irritating the dogs. [eventive only]
       b. (?)The clarinet is irritating the cats.
       c. (?)The noise is annoying the children.
       d. Mary is annoying the children. [eventive only]
       e. The cats are pleasing Alexis and Bettina [eventive only]

And similarly difficult, or alternatively highly coerced (and compare with (91)):\footnote{compare with (89)–(90)}

(123)  a. *The plant is adhering to the fence.
       b. *Guy was knowing the answers.
       c. *Ava is enduring the noise.
       d. *The stain is resisting the cleaning.

In three important contexts, however, the behavior of ING\textsuperscript{PROG} diverges from that of ING\textsubscript{N[v]}. First, no effects whatsoever are attested for weather verbs, showing that for ING\textsuperscript{PROG}, the restriction might very well be against statives as such, and an Originator entailment may not be the issue:

(124)  a. It was raining in Utrecht (last week)
       b. It was snowing in Paris (when I arrived)

Nor does ING\textsuperscript{PROG} interfere with Particle Shift:

(125)  a. Jane is writing the letters up (as we speak)
       b. He is drinking my money up.
Yet another difference emerges in the context of achievements. While for ING\textsubscript{N[v]} these were altogether impossible, in the context of ING\textsubscript{PROG} they receive, when licit, an anticipatory, about-to-happen reading. No such reading is licensed for ING\textsubscript{N[v]}:

(126) a. Kim was reaching the summit.
   b. Pat is ending the flood.
   c. (?)Robin is finding oil.
   d. (?)The bulldozer was hitting bedrock. [under idiomatic interpretation]

(127) a. The train was arriving.
   b. Vesuvius was erupting.
   c. (?)The balloon was exploding.
   d. The rabbit was disappearing.

An account which postulates a unified ING occurring in both progressives and nominals is extremely attractive. We note that at least some of the differences can clearly be attributed to the fact that progressives are embedded within a bigger propositional structure, unlike ING\textsubscript{N[v]}, which is embedded, exclusively, under nominal functional structure and which does not have a full proposition embedded under it. Thus the “availability” of the coercion cases in (120) is clearly attributable to the fact that ING\textsubscript{PROG} can be associated with auxiliaries, whatever their functional role, but auxiliaries, as such, are barred within AS-nominals.\footnote{Note, in this respect, that ING\textsubscript{GER}, even in conjunction with auxiliary be, fails to give rise to an obligatory Originator-oriented reading, and that (i–a–b) if anything, are ambiguous between an Originator and a non-Originator interpretation, and probably favor the latter, thereby indicating, very clearly, that ING\textsubscript{GER} has a function which has little to do with that of ING\textsubscript{PROG};}

34 Similarly, it is plausible to attribute the “anticipatory” reading of (126)–(127) to the presence of a modal operator associated with tense, which, likewise, could not occur within AS-nominals. Finally, the availability of Particle Shift in progressive contexts is very plausibly attributable to the fact that in full propositions, ING\textsubscript{PROG} does not function to block the merger of ASP\textsubscript{Q}, but rather, it scopes over it and “negates” it, so to speak. Insofar as the shifted particle in (125) is only licit in the presence of ASP\textsubscript{Q}, such ASP\textsubscript{Q} does merge, is assigned range (by the quantity DP in its specifier), and is modified by the shifted particle. The entire configuration is then effectively negated by being in the scope of ING\textsubscript{PROG}. This clearly is the only possible scenario, given the fact that conditions on the emergence of quantity hold within the scope of ING\textsubscript{PROG}, in spite of the absence, ultimately, of quantity interpretation:

(128) a. Jane is writing up letters/??writing letters up.
   b. He is drinking up money/??drinking money up.
   c. This computer is eating up energy/??eating energy up.

From a broader perspective, the difference between ING\textsubscript{N[v]}, by assumption blocking the merger of ASP\textsubscript{Q} and ING\textsubscript{PROG}, effectively “negating” it, boils down to

(i) a. John being smart is not something I expected.
   b. Mary being a doctor is something we always hoped for.
the well-observed distinction between inner and outer aspect. \( \text{ING}_{\text{N}[v]} \), then, impacts the properties of inner aspect, while \( \text{ING}^{\text{PROG}} \) is a case of outer aspect. The availability of the latter in clauses, but not in \( \text{AS-nominals} \), would thus follow directly from the availability in clauses, but not in \( \text{AS-nominals} \), of grammatical aspect—\( \text{G-asp} \).

Turning to the issue of the categorial difference between \( \text{ING}^{\text{PROG}} \) and \( \text{ING}_{\text{N}[v]} \), we note that some measure of unification may be available if we assume that \( \text{ING} \), in its \( \text{ING}^{\text{PROG}}/\text{ING}_{\text{N}[v]} \) instantiation, is an underspecified C-functor, insofar as it selects a Categorial Complement Space, always V, but is in itself categorically unspecified, or more likely, underspecified. If one assumes the categorial features in Chomsky (1970), \( \text{ING} \) would thus be \(+\text{N},-\text{V}\), but not specified relative to V, and with any additional categorial properties supplemented by being equivalent to the Categorial Complement Space of some dominating ExP-segment or C-functor. The nominal nature of \( \text{ING}_{\text{N}[v]} \) would then emerge from the embedding of \( \text{ING} \) under D or some other member of the nominal Extended Projection, thereby rendering it equivalent to \([+\text{N},-\text{V}]\). The participial projection, on the other hand, would follow from embedding \( \text{ING} \) under a verbal ExP-segment rendering it equivalent to \([+\text{N},+\text{V}]\), and assuming such specification to be compatible with participles (and with verbal ExP-segments). If, indeed, it is possible for C-functors and for ExP-segments to be categorically underspecified in this manner, a unified treatment for \( \text{ING}^{\text{PROG}}/\text{ING}_{\text{N}[v]} \) may be available for the categorial issue as well. I return to this matter in section 5 of Chapter 7 while discussing homophonous morphemic realizations.

We set the matter of the possible underspecification of \( \text{ING} \) aside here for future research, only to note that given the nature of the XS model, any attempt at a unification would need to appeal either to the properties of the Extended Verbal Projection dominating \( \text{ING}^{\text{PROG}} \) as pre-empting, in some way, its \( \text{Originator} \) selection, or alternatively, appeal to the properties of the Extended Nominal Projection dominating \( \text{ING}_{\text{N}[v]} \) to enforce it. Pending such unification, we note, it remains the fact that the properties of \( \text{ING}_{\text{N}[v]} \) can be derived neither from those of \( \text{ING}^{\text{PROG}} \) nor from those of \( \text{ING}^{\text{GER}} \) and thus fully justify postulating \( \text{ING}_{\text{N}[v]} \), fundamentally a syntactic, categorial function, with an additional semantic function, the nature of which will be further elucidated in Chapter 12.35

### 4.8 The Structure of Long AS-nominals—Summary

As is evident from the discussion of \( \text{ING}_{\text{N}[v]} \), AS-ING nominals are a subset of the (Long) nominal structures available for ATK nominals. Returning to the structures in (8)–(13), we note that the following schemes are attested in English AS-nominals (and

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35 And see section 5 of Chapter 7 for a few comments on the fourth English \( \text{ING} \), that occurring specifically as an adjective.
recall that ATK is a label for multiple instantiations for the otherwise semantically “bleached” functor $C_{N[v]}$:

(129) **Unaccusatives (Quantity), post-N DP:**

a. $\text{[D [EXSN}_2 C_{N[v]} \text{ of DP}_1 [N C_{N[v]} \text{ ]}] \text{ [E } DP_1 \ll e^3 \gg_e [\text{ASP}_0 DP_1^Q \ll e^Q \gg_Q [C=v^v_{\text{xyz}}]]]]]$

ATK

*INGN$_{N[v]}$

b. the arrival of the train

c. *the arriving of the train

(130) **Unaccusatives (Quantity), pre-N DP:**

a. $\text{[D DP}_1 \text{'s [EXSN}_2 C_{N[v]} \text{ of DP}_1 [N C_{N[v]} \text{ ]}] \text{ [E } DP_1^3 \ll e^3 \gg_e [C=v^v_{\text{xyz}}]]]]]$

ATK

*INGN$_{N[v]}$

b. the train’s arrival

c. *the train’s arriving

(131) **Unergatives (non-Quantity), post-N DP:**

a. $\text{[D [EXSN}_2 C_{N[v]} \text{ of DP}_1 [N C_{N[v]} \text{ ]}] \text{ [E } DP_1^3 \ll e^3 \gg_e [C=v^v_{\text{xyz}}]]]]]$

ATK

Originator

INGN$_{N[v]}$

b. the dancing of children (for several days)

c. the formation of ice crystals (for several days)

(132) **Unergatives (non-Quantity), pre-N DP:**

a. $\text{[D DP}_1 \text{'s [EXSN}_2 C_{N[v]} \text{ of DP}_1 [N C_{N[v]} \text{ ]}] \text{ [E } DP_1^3 \ll e^3 \gg_e [C=v^v_{\text{xyz}}]]]]]$

ATK

Originator

INGN$_{N[v]}$

b. the children’s attractive dancing (for several days)

c. the ice crystals’ continuous formation (for several days)

(133) **Transitive, Quantity:**

a. $\text{[D DP}_1 \text{'s [EXSN}_2 C_{N[v]} \text{ of DP}_1 [N C_{N[v]} \text{ ]}] \text{ [E } DP_1^3 \ll e^3 \gg_e [\text{ASP}_0 \text{ of } DP_2^Q \ll e^Q \gg_Q [C=v^v_{\text{xyz}}]]]]]$

ATK

Originator

S-o-Q

*INGN$_{N[v]}$

b. Mary’s formation of the committees (in seven hours)

c. *Mary’s forming of the committees (in seven hours)

(134) **Transitive, non-Quantity:**

a. $\text{[D DP}_1 \text{'s [EXSN}_2 C_{N[v]} \text{ of DP}_1 [N C_{N[v]} \text{ ]}] \text{ [E } DP_1^3 \ll e^3 \gg_e [I=\text{ of } DP_2 [C=v^v_{\text{xyz}}]]]]]$

ATK

Originator

Participant

INGN$_{N[v]}$

b. the court’s investigation of the crime

c. the court’s investigating of the crime
(135)  *Statives (intransitive, tentative structure), post-nominal:36

a. \[ D_1 [E_{-N} 2 C_N[v] [E_{-N} 1] \text{of} \ D_P \left[ N \ C_N[v] [E_{-S} D_P \left[ >_{S} \ldots D_P \left[ \ldots \text{C=V} \pi \sqrt{XYZ}] \right] \right] \right] \text{ATK} \]
\[ *\text{ING}_N[v] \]

b. the adherence of the plant to the fence

c. *the adhering of the plant to the fence

(136)  *Statives (intransitive, tentative structure), pre-nominal:

a. \[ D_1 [E_{-N} 2 C_N[v] [E_{-N} 1] D_P \left[ N \ C_N[v] [E_{-S} D_P \left[ >_{S} \ldots D_P \left[ \ldots \text{C=V} \pi \sqrt{XYZ}] \right] \right] \right] \text{ATK} \]
\[ *\text{ING}_N[v] \]

b. the wall’s adherence to the fence

c. *the wall’s adhering to the fence

In Chapter 5 I turn to the discussion of Short AS-nominals. It is within that context that the final observed contrast between AS-ING nominals and AS-ATK nominals, repeated below, will find its explanation, and where an answer will be provided for the vanishing subject in Short nominals:

(137)  a. the court’s formation of three committees

b. the court’s forming of three committees

(138)  a. the forming of three committees (by the court) (in order to . . . )

b. the formation of three committees (by the court) (in order to . . . )

(139)  a. the committees’ formation (by the court) (in order to . . . )

b. *the committees’ forming (by the court) (in order to . . . )

36 Event structures for stative eventualities are speculative. As already noted briefly in fn. 11 of Chapter 2, Marchand (1960, 1969) argues that -ance/-ence are specifically nominalizers of stative predicates. While the generalization is certainly statistically quite compelling, it is nonetheless not sufficiently general, and therefore cannot justify the postulation of a distinct C-functor, with stative predicates certainly nominalized with -ation, and eventive ones with -ance/-ence quite commonly. What might, however, be workable is postulating -ance/-ence as default spellouts for stative nominalizations. See Chapter 6 for some discussion of default spellout options.
Event Structure in Short Nominals—
the Passive Paradigm

5.1 Against PRO

The starting point of this chapter is the derivation of the forms in (1)–(2):

(1)  a. the formation of the committees
    b. the formation of the committees by the new deans
    c. the forming of the committees
    d. the forming of the committees by the new deans

(2)  a. the (organized) reaction to the austerity measures (by the Greek population)
    b. the (repeated) voting against the bill (by the young Republicans)

The nominals in (1)–(2) all have an understood subject that is not expressed. In all these cases, only one argument, direct or indirect, is present in the structure, and that argument is always the complement. And yet, the “external” argument does have properties in all cases in (1)–(2), and specifically, it can control purpose clauses, as (3) shows:

(3)  a. the forming of the committee in order to improve the faculty–administration relationship
    b. the formation of the committee in order to improve faculty–administration relationship
    c. the voting for Obama in order to restore a measure of sanity to American politics

In attempting to accommodate the presence of an implied subject in (1)–(2), one of the more frequent tacks is to postulate a PRO subject in such cases which, in turn, is the recipient of the external role, our Originator (see, most recently, van Hout and Roeper 1998). Presumably, and within the structures argued for in Chapters 3 and 4, such a PRO would merge as Spec,E, thus being interpreted as an Originator on a par with an overt DP in that position. Subsequent movement might (or might not) further raise it to Spec,D or another nominal specifier, if, for instance, in need of further licensing such as case. If that is indeed so, then at least on some level we expect properties of such covert subjects to pattern with the properties of subjects of
infinitives or (unrealized) subjects of gerunds, in all of which null pronouns, whether PRO or pro, are licensed.¹

Although the arguments for the presence of an implied subject in (1)–(2) are, I believe, compelling, and although such a subject is, as I will argue, a null pronoun, there are nevertheless equally compelling reasons to believe that the null pronominal in question does not occupy the same position as it occupies in gerunds or in infinitives, insofar as it does not share the properties of PROs which typically merge in that position. Rather, I believe, Short AS-nominals should be analyzed on a par with clausal passives, and not on a par with infinitives or gerunds. In order to show that this is so, consider the properties of PRO as often discussed in the literature. First, note, our putative PRO (in the absence of a by-phrase) need not have a controller, as (4a–c) show, and hence by the common classification of PROs, must be an arbitrary PRO:

(4) a. The forming of a complex event nominal proceeded according to plan.
   b. The formation of a complex event nominal was successful.
   c. The application for citizenship was granted.

Arbitrary PRO, as is again well established, has universal/generic, rather than existential, properties. However, the implied subjects in (4a–c) are existential, rather than generic, as I shall proceed to show. Lebeaux (1984), in discussing this matter, points out that within an appropriately defined local domain, all occurrences of uncontrolled PRO need to have a universal interpretation, and hence need to refer to the same antecedent, as illustrated by (5):²

(5) a. [PRO to organize the labor force] entails [PRO to raise salaries]
   b. [PRO to hand in assignments late] entails [PRO awarding bad grades]
   c. [PRO handing in assignments late] entails [PRO awarding bad grades]
   d. [PRO reacting to the austerity measures] entailed [PRO harassing political activists]

The examples are striking because the only interpretation available for e.g. (5b–c) is that the very same person who handed in the assignments late would be awarding bad grades, a rather implausible construal, which is nevertheless forced due to the obligatory reference of both occurrences of PRO to the same universal reference. Similarly, the identification of the subject of reacting and the subject of harassing in (5d) makes little sense; and yet, that is the only reading available. In contrast, such an odd construal is not forced in AS-nominals, as (6) shows:

¹ The claim here is neutral relative to the status of infinitival and gerundive null subjects as PROs, as is commonly assumed, or as proos, as is argued, e.g., in Bouchard (1984) or in Borer (1989b). Specifically, null subjects in infinitives and gerunds may either be referential, requiring an antecedent, or arbitrary, i.e. generic, in the absence of such an antecedent. In the subsequent discussion, PRO is used to avoid confusion, but the reader should bear in mind that the distinction here is positional, rather than contingent on the actual inherent nature of the null pronoun and that arguments provided against the presence of arbitrary generic PRO carry over to exclude an arbitrary generic pro as well.

² With thanks to Andrew McIntyre for the examples in (5b, c) and (6b).
(6) a. The organizing of the labor force entails the raising of salaries.
   b. The handing in of assignments late entails the awarding of bad marks.
   c. The destruction of the work environment {entailed/gave rise to} the reorganization of the labor force.
   d. The (organized) reaction to the austerity measures {entailed/gave rise to} the harassment of political activists.

Certainly, the most common—and available—sensible reading of (6a–d) is that which involves disjoint reference for the perpetrators of the event on the left and the perpetrators of the event on the right. That such a reading is available shows that a PRO, if indeed there is one in (6a–d), does not pattern with the PRO in the infinitives and gerunds in (5a–d).

While the behavior of the implied subject in Short AS-nominals does not tally with that of implied subjects of infinitives and gerunds, it does tally with the behavior of implied subjects in passives. In Borer (2005b), I suggest that the implicit arguments in passive constructions are null (indefinite) pronominals, pros, which may receive either an existential interpretation or a generic one, the latter in the context of a generic adverb of quantification or some other environment which facilitates such a construal. Thus the understood subject of decided in (7a) receives an existential interpretation, while the understood subject of believed in (7b) may receive a generic interpretation, being in the scope of the adverbial in the Middle Ages. Likewise, the generic interpretation of English present tense results in the emergence of a possible generic interpretation for the implied subject in (7d), but no such interpretation is readily available for (7c):

(7) a. It was decided this morning that Alex should travel to New York on his own.  
   (→by some unspecified parties)  
   b. In the Middle Ages it was believed that if you travel west you will get to India.  
   (→by everyone)  
   c. Committee work was despised. (→by some unspecified parties)  
   d. Committee work is despised. (→(possibly) by everyone)

In turn, the Lebeaux effect does not emerge with respect to implicit arguments in passive constructions. Thus consider (8a–c), where, likewise, a disjoint interpretation for the implicit arguments is not only available but is pragmatically preferred (and compare with the gerunds in (9)):

(8) a. The workers had to be organized before salaries could be raised.  
   b. The work environment had to be destroyed before the reorganization of the workforce was attempted.  
   c. The bicycle rider was beaten while he was being filmed.

(9) a. Organizing the workers (took place) before raising salaries.  
   b. Destroying the work environment before reorganizing the workforce makes no sense.  
   c. Beating the bicycle rider while filming him is really clever.
Finally, as in the case of clausal passive, a generic interpretation for the implicit subject in AS-nominals is available in appropriate contexts, where it is, presumably, licensed by a generic operator:

(10) a. In the Middle Ages, old people were particularly appreciated. [→by all]
    b. In some parts of the world, girls are excluded from school. [→by all]

(11) a. The appreciation of old people in the Middle Ages [→by all]
    b. The exclusion of girls from school in some parts of the world [→by all]

It thus emerges that the properties of the missing subjects in (1)–(2) are considerably closer to those of implicit passive arguments than to those of gerundive or infinitive covert subjects, insofar as they allow an existential reading where it is systematically excluded for infinitives and gerunds, but licit for implicit arguments in passive. This result, in turn, suggests that the best way to treat (1)–(2) is as cases of passive, in some sense. In turn, that the derivations in (1)–(2) are passives is prima facie plausible, given the presence of by-phrases, and given the fact that quite independently of the properties of AS-nominals, both variants of the passive, i.e. those with a covert subject and those with a by-phrase, are typically assumed to have a fundamentally similar derivational source.

A priori, a successful reduction of the properties of (1)–(2) to passive, under some structural execution, instantaneously stands to gain a striking advantage over analyses which do not subscribe to such passive derivation. It would enable us to dispense with the assumption that the distribution of “external” arguments in AS-nominals differs from their distribution in clauses. Such a putative asymmetry is first put forth in Chomsky (1970) by way of arguing against a syntactic derivation for derived nominals, and it has enjoyed much discussion in the literature, focusing, as it does, on the contrast in (12):

(12) a. *organized the union
    b. the organizing of the union

Contrasts such as (12a–b) have often led to the conclusion that in some crucial sense, subjects are optional in nominals, even if these nominals are otherwise assumed to be capable of assigning arguments, either directly or through the presence of an embedded event complex. In contrast, they are presumed obligatory in clauses (cf. Chomsky 1970, 1981; Roeper 1987b; Williams 1987; Safir 1987; Grimshaw 1990; Marantz 1997; Alexiadou 2001, among many others). But according to the view to be presented here, (12b) should not be compared to (12a), but rather to (13), doing away with the putative asymmetry between clauses and nominals, and reducing the missing subject in AS-nominals to the applicability of grammatical operations otherwise well attested within event structure:

(13) The union (was) organized.

I already assumed that the very same event structure projects within AS-nominals and within clauses, and that essentially, it is not subject to in-principle construction-specific constraints. In other words, there are no event structure combinations
which are attested inside nominals but which cannot be attested, in principle, within
clauses; and conversely: no event structure combinations attested in clauses are
barred, in principle, within AS-nominals. There are, to be sure, specific structural
properties which hold for (some) clauses but not for AS-nominals, and vice versa, but
they do not involve the available event structure combinations as such. Rather, they
emerge from the fact that “AS-nominal” is a name for the syntactic configuration in
which event structure is embedded under N, while, e.g., “tensed clause” is a name for
a configuration in which event structure is embedded under T and g-asp or under
modals. As a result, some differences may emerge which concern, for instance, the
range of structural cases available in AS-nominals vs. the range of structural cases
available in clauses; they may involve extra restrictions placed by functors (such as
INGN[v] or some instantiation of g-asp, respectively), or by the internal syntax of
AS-nominals as it emerges from different conditions that may constrain the move-
ment of the verb to merge with the Cn[v] functors vs. its movement to merge with T.
There is little prima facie reason to believe, however, that any of these should bear on
the realizability of the “external” argument, or on the possibility, or lack thereof, of
embedding passive under N.3

Finally, we note that should it turn out that a passive derivation for the
AS-nominals in (1)–(2) is possible, it stands to strengthen considerably the claim
that clauses and AS-nominals have substantial structure in common.

A passive analysis of Short AS-nominals, as pointed out, does have a prima facie
advantage over a PRO analysis. To be fully successful, however, it must address a
number of questions which emerge immediately in the context of the paradigm in
(1)–(2). First, as is patently evident, Short AS-nominals, by assumption passive, are
not morphologically marked as such. If we take, specifically, the participial marking
of passive in clausal cases to be crucial for the emergence of a passive con-
figuration, how can such a passive configuration emerge in its absence?

Second, some, but not all of the cases in (1)–(2) have a correlate which involves a
pre-nominal DP, as (14):

(14) a. the committee’s formation (by the officials) (in order to address that
grievance)
b. *the committee’s forming (by the officials) (in order to address that
grievance)

The null hypothesis is that the configurations in (1)–(2) and at least the licit case in
(14a) do have substantial structure in common. Concretely, and if indeed e.g. (1a) is a
case of passive, then (14a) would result from the raising of the promoted passivized
object in (1a) to Spec,D, or some other relatively high nominal specifier in which ‘s
marking is available. But if this is the case, how can we account for the illicit result of
such a “raising passive” in the presence of AS-ING nominals, as in (14b), an effect
well known and already noted and discussed in Chapter 4?

3 As I shall argue in section 5.3, PRO/pro subjects are not excluded in AS-nominals in principle, nor
would such an absolute exclusion be expected in view of their occurrence in gerunds. Rather, PRO/pro
subjects are excluded in the presence of an article.
An additional question concerns the cases in (2). If, as I will suggest, (2) is a case of passive, some attention must be paid to the fact that within the clausal domain, such (impersonal) passives are illicit, as (15) illustrates. Why should impersonal passives be licit in the AS-nominal domain, but not in other clauses?

(15) *(it) was reacted to the austerity measures (by the Greek population)

The organization of this chapter is as follows. In sections 5.2 and 5.3, I provide evidence for a passive analysis of Short AS-nominals which is independent of any specific analysis of the passive. Section 5.4 offers an outline of an analysis of the passive, along the broad lines of Baker, Johnson, and Roberts (1989), but diverging from it specifically when it comes to the role played by participial morphology. Section 5.5 contains a detailed analysis of the Short AS-nominals in (1)–(2) and addresses the availability, or lack thereof, of impersonal passive and pseudo-passive structures within Short AS-nominals. Section 5.6 tackles raising passives, showing that their systematic exclusion in AS-ING nominals follows directly from the properties of passive, the properties of event structure, the properties of ING\textit{N}[V] and independent constraints on internal merge. Finally, section 5.7 offers morphological evidence for the existence of the passive in AS-nominals. Some concluding comments are in section 5.8.

5.2 Evidence for the Passive in Hebrew AS-nominals

Consider again some aspects of AS-nominals in Hebrew already discussed in some detail in Chapters 3 and 4, and specifically the structures in (16a–b):4

(16) a. ha.hokaxa  šel ha.ṭe?ana (?al ye?ey ha.matematiqa’it )
   the.proof of the.claim (by the.mathematician)
   ‘the proof of the claim (by the mathematician)’

   b. ha.šiqqum  šel ha.ʔir (?al ye?ey ha.šilṭonot)
   the.rehabilitation of the.city (by the.authorities)
   ‘the rehabilitation of the city (by the authorities)’

The properties of (16a–b) correspond exactly to the properties of their English correlates: the by-phrase, or the missing subject, respectively, may control an implicit argument, as in (17):

(17) ha.hokaxa  šel ha.ṭe?ana (?al ye?ey ha.matematiqa’it) kedey li-zkot b-a.pras
   the.proof of the.claim (by the.mathematician) in-order to-win in-the.prize

Not surprisingly at this point, while the omission of the subject in (16) is possible, the omission of the object while retaining the subject is not compatible with maintaining an AS-nominal reading:

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4 As in Chapters 3 and 4, Construct nominals are set aside unless their properties differ from those of Free nominals in ways which are relevant to the discussion.
the proof of the mathematician in-order to-win in-the-prize

I already noted in section 4 of Chapter 3 that the Hebrew by-phrase occurs otherwise only in verbal passives, and, unlike English by, is not licensed in authorship contexts such as a picture by van Gogh. Its presence in AS-nominals thereby argues for the presence of a VP constituent. It argues with equal strength for the presence of an actual passive derivation in AS-nominals as well.

Even stronger evidence for passivization in (16a–b) comes from the fact that the Long variants of (16a–b), as in (19a–b), involve the presence of the object marker 'et, obligatory here due to the definiteness of the internal arguments. Such an object marker is, however, impossible in Hebrew Short AS-nominals, where the “internal” argument must be šel-marked (or alternatively must form a construct with the derived nominal) as in (20), and where marking with the object marker 'et leads directly to ungrammaticality, as (21a–b) show. Recall that in the presence of an overt subject (itself marked with šel), the object may not be šel-marked, as (22) shows (and see Chapter 2, section 2.1 as well as Chapter 4, section 1 for discussion):

(19) a. ha.hokaxa šel ha.matematiqait 'et ha.ţe?ana
the.proof of the.mathematician om the.claim
'the mathematician’s proof of the claim'
b. ha.šiqqum šel ha.šilānnot 'et ha.ţir
the.rehabilitation of the.authorities om the.city
'the authorities’ rehabilitation of the city’

(20) a. ha.hokaxa šel ha.ţe?ana (al yedey ha.matematiqait )
the.proof of the.claim (by the.mathematician)
b. ha.šiqqum šel ha.ţir (al yedey ha.šilānnot)
the.rehabilitation of the.city (by the.authorities)

(21) a. *ha.hokaxa 'et ha.ţe?ana (al yedey ha.matematiqait )
the.proof om the.claim (by the.mathematician)
b. *ha.šiqqum 'et ha.ţir (al yedey ha.šilānnot)
the.rehabilitation om the.city (by the.authorities)

(22) a. *ha.hokaxa šel ha.matematiqait šel ha.ţe?ana
the.proof of the.mathematician of the.claim
'the mathematician’s proof of the claim'
b. *ha.šiqqum šel ha.šilānnot šel ha.ţir
the.rehabilitation of the.authorities of the.city
'the authorities’ rehabilitation of the city’

If, indeed, the missing subject in Short AS-nominals is a PRO or any other null element occupying the very same position an overt subject would be occupying, the ungrammaticality of (21) would become entirely mysterious. Objective case is entirely oblivious to the phonological realization of the subject, occurring in Hebrew
infinitives freely in the presence of a PRO subject, as (23) shows (note that the covert subject in the embedded infinitives in (23) receives an arbitrary interpretation, thereby contrasting minimally with (21)).

(23) a. _lo barur eyx_ (PRO) _le-hokiax _et_ ha.تا?ana
not clear how to-prove _OM_ the.claim
'It is not clear how to prove the claim.'

b. _lama carix le-šaqqm _؟اري xop?
why necessary to-rehabilitate cities coast
'Why is it necessary to rehabilitate coastal towns?'

Thus the impossible objective case in (21) directly argues against the presence of a subject PRO, and for a passive analysis, where in Hebrew clausal contexts, as in English, objective case is impossible, even when the "object" is post-verbal:

(24) a. _ha.تا?ana hukexa_ (?al yedey ha.matematiqa’it)
the.claim proved.PASS (by the mathematician)

b. _ha.؟ir šuqqma_ (?al yedey ha.؟iriya)
the.city rehabilitated.PASS (by the city administration)

(25) a. _ha.شانا hukexu_ (*’et) _kol ha.фе?اناوت ha.؟؟le
this.year proved.PASS *OM all the.claims the.these
(؟al yedey ha.matematiqaim ِشل.ا؟؟n) (by our mathematicians)

b. _kol ِشانا mešuqqam_ (*’et) _eyze rexob b-ا.؟ir
every year rehabilitated.PASS *OM some street in-the.city

Further compatible with a passive analysis of Short AS-nominals is the ungrammaticality of (26a), where an ِ؟ال yedey, effectively a by-phrase, occurs without an object, directly on a par with the ungrammaticality of the Hebrew verbal case in (26b) and the English one in (26c):

(26) a. _*ha.hokaxa ِ؟ال yedey ha.matematiqa’it
the.proof by the.mathematician
‘the proof by the mathematician’

b. _*hukexa ِ؟ال yedey ha.matematiqa’it
proved.PASS by the.mathematician
‘was proven by the mathematician’

c. _*It was proved by the mathematician [expletive it]

d. _*the proving by the mathematician

5 The Hebrew constructions labeled by Hazout (1991) as gerunds and already discussed briefly in Chapter 3 do not allow for a covert subject or for an object "promotion" altogether, making them irrelevant in this context.
We thus have a structure with a covert “external” argument with all the properties of a “demoted” subject in passive. It may be an indefinite or a generic pro, contingent on the very same context that licenses such readings in clausal passive; it may be either implicit or merge as a by-phrase, and finally, the object, otherwise obligatory, loses its objective-case marking. Rather, the case assigned to the “internal” argument is precisely that which is otherwise associated with the “external” argument (through sel) in the Long derivation, when both arguments are present. That something very much on a par with the formation of verbal passive is going on here does appear rather inevitable. As we shall see, the contrastive behavior of de-adjectival nominals provides additional support for the existence of passive in de-verbal nominals.

5.3 De-adjectival Nominals

5.3.1 An asymmetry and its resolution
Two related claims I make in this work can be supported by examining de-adjectival nominals such as awareness, closeness, etc. First, I have argued that (de-verbal) AS-nominals contain an embedded VP. Second, I have claimed that the implicit argument properties in (definite) AS-nominals stem from an implicit indefinite pro which is (typically) existentially closed, on a par with that found in verbal passives, and not from the presence of an unrealized PRO subject (presumably in Spec, D), as is frequently assumed. As it turns out, support for both of these claims is found in the properties of de-adjectival nominals.

In section 7.1 of Chapter 3, I already established, based on Roy (2009), the need for an AP along with its Extended Projection within such nominals. In investigating their properties (specifically in French), Roy suggests that they be divided into “Q-nominals” (Quality nominals) and “S-nominals” (for Stative nominals), with the following properties:

(27) S-nominals
   a. Stative reading
   b. obligatory (overt) external argument
   c. constant, rapide, etc. modification possible without plural morphology
   d. de-phrase in French is an argument
   e. must appear with an article in both French and English (with the subject de-marked for French and of-marked for English) [post-nominal subjects only, see below]

6 We note in reference to the discussion in Chapter 3, section 3, that the disappearance of ‘et in the derivations in (16) provides further evidence against Siloni’s (1997) view of ‘et in AS-nominals as an inherent case marker. As is very well established, inherent case markers do not disappear under passivization.
(28) **Q-nominals**
   a. Quality reading
   b. no apparent external argument
   c. *constant, rapide*, etc. modification not possible without plural morphology
   d. *de-*phrase is not an argument
   e. can be bare in English (but not in French)

   It is S-nominals, in turn, which must embed a predicative structure, and which exclude adjectival interpretations that are not compatible with predicates, as already discussed in Chapter 3. It is therefore S-nominals that could, and should, be compared to AS-nominals (taking the latter in this context to be specifically de-verbal).

   Roy’s discussion concerns both transitive and intransitive S-nominals, and we note that within the domain of intransitive (English) S-nominals, the distribution of subjects is exactly that which we find in intransitive de-verbal AS-nominals: the subject may be either *of*-marked, by assumption in some nominal specifier, or may occur pre-nominally and be marked with ‘s:

   (29) a. the gentleness of the boys ⇔ the boys’ gentleness
   b. the popularity of this song ⇔ this song’s popularity
   c. the cowardice of the president ⇔ the president’s cowardice

   In turn, when a complement of an S-nominal is itself *of*-marked, as is the case with transitive AS-nominals, the understood subject in English must occur pre-nominally. As in AS-nominals, the subject may occur post-nominally and with *of*, providing the complement is not direct and thus not in need of *of*-insertion:

   (30) a. the court’s awareness of the problem ⇔ *the awareness of the court of the problem
   b. Pat’s consciousness of my presence ⇔ *the consciousness of Pat of my presence

   (31) a. Robin’s readiness to leave ⇔ the readiness of Robin to leave
   b. The courtier’s closeness to the king ⇔ the closeness of the courtier to the king
   c. the house’s proximity to the road ⇔ the proximity of the house to the road
   d. the party’s satisfaction with the results ⇔ the satisfaction of the party with the results

   The picture is extremely similar to that which is attested in de-verbal AS-nominals, and as such, lends independent support to some of our previous claims. Note that the existence of (dummy) *of*-markers for the complements of adjectives is unquestionable.

   7 While a structural equivalent of *E* is assumed to exist in stative structures, it goes without saying that in such contexts it does not assign an *Originator* role. Postulating, e.g., a *Subject-of-state* role in that position, we note that the movement of an argument to some nominal specifier while merging with Spec, *E-state* en route does not result in any locality violation. A fuller structure for statives is not attempted in this work. For an interesting development of structure for statives based on non-lexical syntax, see Husband (2012).
In turn, it is clear that the source of *of*-marking for the subject in the intransitive cases in (29) is the nominal domain, rather than the adjectival domain. And yet, these two *of*-markings, although quite differently licensed, cannot be concatenated, lending support to the claim that English does have a Double-*of* Filter which excludes the concatenation of *of*-marked DPs regardless of their structural source, and which effectively forces the subject, in long derivations, to move to Spec,D (see Chapter 4, section 1.2 for the relevant discussion).

Suppose we consider now the “transitive” paradigm more carefully, including under “transitive” all cases with complements, and taking the cases in (32) as our starting point:

(32)  a. the court’s awareness of the problem  
      b. Pat’s consciousness of my presence  
      c. Jill’s fondness of music  
      d. Robin’s readiness to leave  
      e. the courtier’s closeness to the king  
      f. the house’s proximity to the road  
      g. the party’s satisfaction with the counting results  
      h. my sister’s happiness with the new house

Note that the nominals in (32) are certainly S-nominals in Roy’s (2009) classification. They allow modifiers such as *constant* and *frequent*, they do not pluralize, they retain their arguments, etc.:  

(33)  a. the court’s constant awareness of the constitutional problem  
      b. Robin’s frequent readiness to leave  
      c. Guy’s closeness to the British throne from 1991 to 1996  
      d. the party’s satisfaction with the results for a few hours  
      e. Jill’s fondness of cats for several years

This said, S-nominals part company with de-verbal AS-nominals in one important respect (see Borer 1999b; Roy 2009): while the subject in (definite) AS-nominals may be missing in transitive cases, giving rise to Short AS-nominals, “Short” (definite) adjectival AS-nominals are illicit, as illustrated by (34). Note that *by*-phrases are excluded as well:

(34)  a. *the awareness of the constitutional problem (by the court)  
      b. *the consciousness of my presence (by Pat)  
      c. *the fondness of classical music (by Jill)  
      d. *the readiness to leave (by Robin)  
      e. *the closeness to the British throne (by Diana)  
      f. *the proximity to the road (by the house/Kim)  
      g. *the satisfaction with the counting results (by the party)  
      h. *the happiness with the new house (by my sister)

---

8 The preferred variant is ‘*for music’*, although most speakers do accept ‘*of music’* as well. I take the alternation to be, fundamentally, a spellout effect.

9 The impossibility of pluralization, recall, is a hallmark of non-quantity AS-nominals, which, as statives, de-adjectival nominals certainly are.
The ungrammaticality of (34) is replicated in French, as noted by Roy (2009):

(35)  a. la fierté constante *(de Jean) pour son travail
      the pride constant *(of Jean) for his work
   b. la folie *(de Tom) pour les films
      the craziness *(of Tom) for the films

No such obligatoriness is in evidence for Q-nominals, Roy’s equivalent to R-nominals within the de-adjectival domain. In turn, the ungrammaticality of (34)–(35) presents a problem for any account which does not relate the properties of derived nominals to their derivational history, a matter we already discussed in Chapter 2. They also present a problem for all accounts which subscribe to the view that the external argument need not be realized within the event structure domain in AS-nominals (or S-nominals), and rather merges optionally as a free interpretation possessor. Finally, they present a clear problem for the assumption that the subject of AS-nominals, and by extension S-nominals, may be PRO. None of these assumptions offers an account for the asymmetry which renders Short (definite) S-nominals ungrammatical, as in (34)–(35), but Short de-verbal AS-nominals perfectly licit in the very same context. Accounts that postulate a by-phrase in AS-nominals which is unrelated to the presence of a verbal constituent (e.g. Alexiadou 2001 or Siloni 1996, 1997) face an additional problem when attempting to account for the impossibility of such a by-phrase in S-nominals.

If, however, Short AS-nominals are cases of passive, as I propose here, the ungrammaticality of (34)–(35) reduces immediately to the fact that adjectival structures do not passivize. Whatever rules out the cases in (36) would directly rule out (34)–(35):10

10 Likewise, the absence of passive for APs would rule out (ia–c) under the assumption that they could only be derived from the already ungrammatical (34). The argument, however, is not conclusive insofar as the cases in (ia-c) are presumably independently ruled out by some form of the “affectedness” constraint. See section 5.6 for some discussion.

(i)  a. *the problem’s awareness
    b. *my presence’s consciousness
    c. *classical music’s fondness

Of some interest is the grammatical case in (iia), where an external argument is absent, but where its potential absence correlates with the availability of a by-phrase and with the availability of implicit argument control (note that it contrasts directly with the virtually synonymous, but still ungrammatical, (iib)):

(ii) a. the willingness to use force (by the authorities) (in order to enforce the ban)
    b. *the readiness to use force (by the authorities) (in order to enforce the ban)

Willing, then, seems to straddle a rather fine line between being an adjective and being a verb, the latter, potentially, only overtly in participial contexts. Insofar as the potential absence of the subject does correlate with a possible by-phrase and with implicit argument control, however, the case, puzzling as it might otherwise be, appears to be unusual in allowing passive where it shouldn’t occur, rather than in allowing a null subject where it should be obligatorily overt.
(36)  a. *The problem is aware (of) (by the court)
    b. *My presence is conscious (of) (by Kim)
    c. *Classical music is fond (of) (by Jill)
    d. *The throne is close to (by Marcia)
    e. *The road is proximate to (by the house/Pat)
    f. *The counting results are satisfied with (by the party)

Note that beyond appealing to the unpassivizability of AP predicates, however explained, simply nothing else needs to be said to account for the emerging pattern of (un)grammaticality. The obligatoriness of the subject and the impossibility of by-phrases are exactly what is expected. In its simplicity and directness, then, the account for the ungrammaticality of (34)–(35) lends considerable support to the analysis of Short AS-nominals as cases of passive.

We note finally that insofar as some ergative adjectives (in the sense of Cinque 1990) do have nominal correlates, we expect them to be excused from the effect documented in (34), a prediction that is verified by (37):11

(37)  a. the likelihood that Roger will be on time
    b. the possibility/probability that the boat would be released

5.3.2 Short AS-nominals, S-nominals, and scope

The contrastive properties of AS-nominals and S-nominals, the latter specifically in the context of “ability” nominals, are discussed in van Hout and Roeper (1998) as well as in Roeper and van Hout (2009). Thus Roeper and van Hout note the contrast between the scope possibilities of the AS-nominal in (38a) and the S-nominal in (38b) (neutral intonation):

(38)  a. The election/electing of nobody surprises me.
    i. I am surprised that nobody was elected.  [narrow scope]
    ii. Nobody is such that his election surprises me.  [wide scope]

11 Most ergative adjectives, however, do not have licit S-nominal correlates, as the contrast in (i)–(ii) shows. Similar restrictions hold for Tough adjectives. Although an explanation is clearly needed, we note that such de-adjectival nominals are barred even in the absence of movement, and thus may go some way towards accounting for the absence of both Raising and Tough in derived nominals:

(i)  a. *its/the obviousness that Roger will be late
    b. *its/the clarity that Roger will be of no use
    c. *its/the certainty that Roger will let us down

(ii) a. the probability/possibility/likelihood that we will get to Gaza
    b. *the easiness/difficulty/toughness/niceness/attractiveness to settle the conflict

No such difficulties emerge for Q-nominals, often the direct correlates of the ungrammatical cases in (i–ii):

(ii) a. the clarity of the water
    b. the certainty of her results
    c. the toughness of the leather
    d. the difficulty of the problem
b. The electability of nobody surprises me.

i. ??I am surprised that nobody was electable.  [narrow scope]
   ii. Nobody is such that his electability surprises me.  [wide scope]

As van Hout and Roeper (1998) and Roeper and van Hout (2009) note, the effects argue rather strongly that the argument of S-nominals must be high, but not so the argument of AS-nominals, although both are, in some sense, “themes”. The picture, however, is somewhat more subtle. Thus, completing the picture in (38a–b), consider cases in which the subject is realized in AS-nominals, in both transitive (39) and intransitive contexts. Note now that the subject receives wide scope exclusively, as in (40), thus patterning exactly with the subject of de-adjectival nominals in (38b), hardly a surprising result. When we consider, however, the object in (39), we find that it parts company with the “object” in (38a). Thus while the object in (38a) allows both wide and narrow scope, the object in (39) only allows narrow scope, and wide scope is summarily excluded without a focal stress. Note, for the sake of completeness, that there is no discernible difference here between the properties of AS-ATK and AS-ING nominals:

(39) The council’s election/electing of nobody surprises me.
   i. I am surprised that the council elected nobody.
   ii. *Nobody is such that the council electing him surprises me.

(40) The lecturing/resignation of nobody surprises me.
   i. *I am surprised that nobody lectured/resigned.
   ii. Nobody is such that their lecturing/resignation surprises me.

If, however, wide scope is excluded for objects, how can we account for the availability of such wide scope for the ambiguous (38a)?

An account, is of course, readily available, once we consider the possibility that Short AS-nominals such as those in (38a) involve passive. That passives are scopally ambiguous is one of the oldest and most robust observations within generative grammar, and has set the stage not only for post-syntactic (rather than deep-structure contingent) interpretation but also for reconstruction within the domain of A-movement. Thus consider the scope ambiguity of the passivized subject in (41) relative to the matrix subject, vs. the absence of such ambiguity in (42):

(41) a. Two men believed three women to have been expelled unjustly by the management.
   i. 2 men > 3 women (possibly 6 women in total)  [narrow scope]
   ii. 3 women > 2 men (same 3 women)  [wide scope]

b. Every voter wants some senator to be invited to his hometown (by the organizers).
   i. every > some (potentially distinct) senator  [narrow scope]
   ii. some > every (1 senator, in total, is very popular)  [wide scope]
a. Two men believed the management to have expelled three women.
   i. 2 men > 3 women (possibly 6 women in total) [narrow scope]
   ii. *3 women > 2 men (same 3 women) [wide scope]

b. Every voter wants the organizers to invite some senator.
   i. every > some (potentially distinct senator) [narrow scope]
   ii. *some > every (1 senator, in total, is very popular) [wide scope]

It thus emerges that the conclusions to be drawn from scopal interaction are as follows:

a. The logical subjects of de-adjectival nominals are born high and live high.
b. The logical objects of de-verbal nominals are born high and live high.
c. The logical objects of de-verbal nominals in the presence of an overt subject are born low and are stuck living there.
d. Not so, however, the logical objects of de-verbal nominals when there is no overt subject. Low born, they nonetheless get to live high (but nonetheless cannot entirely erase their origins).

Metaphors aside, the picture tallies, directly, with the behavior of subjects and objects in clausal contexts. As is well known, subjects of predicative adjectives are always external (see, in particular, Levin and Rappaport 1986 and much subsequent literature). The external status of transitive subjects in verbal contexts or for the verbal predicates underlying (40) is not in dispute either; nor is the internal status of direct object in transitive contexts, in some relevant sense. Finally, passivized objects display a mixture of diagnostics, associated specifically with the fact that they are assigned their event role in one position, but proceed to be promoted to become grammatical, if not logical subjects. Their scopal properties, in turn, reflect this complex history. To the extent that within AS-nominals and S-nominals the very same properties are attested thus lends extremely strong support for viewing (38a) and similar cases as instances of passive. In conjunction with the impossibility of omitting the subject in de-adjectival nominals already observed in section 5.3.1, this provides extraordinary support not just for a generalized case of passive, but specifically for a passivizable (Extended Projection of a) VP.

In order to complete the picture, note that identical effects are attested in gerunds, thereby providing an instance where AS-nominals (and S-nominals) do behave like gerunds, and where the source of the common behavior is exactly the presence of an embedded VP or AP:

a. The council electing nobody surprises me.
   i. I am surprised that the council elected nobody.
   ii. *I am not surprised that the council elected anybody.

b. Nobody being elected surprises me.
   i. I am surprised that the council elected nobody.
   ii. I am not surprised that the council elected anybody.

c. Nobody being electable surprises me.
   i. ??I am surprised that nobody is electable.
   ii. I am not surprised that anybody was electable.
5.3.3 The return of the PRO/pro

As it turns out, the ungrammaticality of (34) as well as the scope effects discussed directly above, are restricted to S-nominals which occur with an overt determiner. When the S-nominal is bare, however, as in (45) the subject may be absent (although a by-phrase remains illicit):\(^{12}\)

(45)  a. awareness of the constitutional problem (*by the court)
      b. consciousness of my presence (*by strangers)
      c. fondness of classical music (*by youngsters)
      d. readiness to leave (*by passengers)
      e. closeness to the British throne (*by sycophants)
      f. remoteness from public life (*by adolescents)
      g. happiness with a new home (*by young couples)

If passive is, indeed, ruled out in principle in S-nominals due to their adjectival source, what can account for the grammaticality of (45) when contrasted with the ungrammaticality of (34)?

Recall now that the argument against the presence of a PRO subject in AS-nominals rested on the interpretation of the missing subject in AS-nominals in Short derivations as an existential, rather than a universal one, on a par with the implicit argument in passives, and unlike the subject of gerunds or infinitives (see section 5.1 for discussion). Strikingly, an examination of the missing subject in (45) reveals that the understood subject here is interpreted as universal. Thus compared with (6), repeated here as (46), we have (47). Note that a different-subject construal for (47b, c) would be plausible enough, as (48) shows, and that furthermore, there are no independent conditions that would bar distinct subjects in such cases. Rather, it is precisely the presence of necessarily co-indexed instances of PRO that renders the cases in (47b, c) anomalous:

(46)  a. The organizing of the labor force entailed the raising of salaries.
       \(\textit{non-identical subjects reading possible}\)
      b. The destruction of the work environment entailed the reorganization of the labor force.
       \(\textit{non-identical subjects reading possible}\)

(47)  a. Awareness of the constitutional problems entailed readiness to change the law.
       \(\textit{identical subjects reading only; plausible}\)
      b. #Awareness of the constitutional problems entailed reluctance to change the law.
       \(\textit{identical subjects reading resulting in a semantic anomaly}\)
      c. #Happiness with killed foxes entailed over-sensitivity to the rights of wildlife.
       \(\textit{identical subjects reading resulting in a semantic anomaly}\)

(48)  a. The Democrats’ awareness of the constitutional problems entailed the Republicans’ reluctance to change the law.
      b. Their happiness with killed foxes entailed our over-sensitivity to the rights of wildlife.

\(^{12}\) French disallows bare Ns across the board, making the equivalent of (45) independently illicit.
The conclusion we must draw, and which is far from trivial, is that in (45), but not in (34), a null pronominal could occur, and that in that position, in the manner of the subject of gerunds and infinitives, it receives a universal (or generic) interpretation.

There is but one distinction between the cases in (34) and the cases in (45): the former occur with an article, while the latter are bare. The inevitable conclusion, then, is that an article in D is incompatible with a (generic) PRO. We now note that an article in D is independently incompatible with a pre-nominal argument, giving rise to the well-known effect in (49a–b) already discussed in a very different context in Chapter 1:

\[(49)\]
\[
\begin{align*}
&\text{a. } \^\text{John's the hat} \\
&\text{b. } \^\text{the [John's hat]}
\end{align*}
\]

The effect in (49a–b), in turn, is typically attributed to the structural competition between the definite article and the genitive marker 's (see, most notably, Abney 1987). Such an account, however, may not suffice to block occurrences of PRO (or pro) with the definite article, under the assumption that such a null pronominal is not in need of case, and thus the absence of 's would not give rise to a problem.\(^{13}\) An alternative account would bank, rather, on the account proposed in Borer (2005a), and summarized briefly in Chapter 1. According to such an account the competition is not between 's and a determiner, but rather between two competing range assignors to \(<<e>>_D\). As is well known, Saxon genitives exhibit definiteness agreement between the genitive and D. Thus in (50a) the entire DP is perforce definite, while in (50b) it is perforce indefinite:

\[(50)\]
\[
\begin{align*}
&\text{a. John's hat} \\
&\text{b. a cat's toy}
\end{align*}
\]

Suppose, then, that the genitive assigns range to \(<<e>>_D\) through some specifier-head agreement mechanism. An article in D, if present, would be a functor which would be required to assign range to the very same open value. The derivation, then, would be illicit under the assumption that such a situation, a species of vacuous quantification, is excluded. In turn, and insofar as PRO is certainly a definite DP, it is an appropriate range assignor to \(<<e>>_D\). The licit derivations involving a single range assignor to \(<<e>>_D\) are as in (51) (and see Chapter 1, section 5.3 for more details). The illicit derivations with a double range assignor are in (52), providing a direct account for the impossibility of both PRO and an overt DP occurring in Spec,D alongside an article:

\[(51)\]
\[
\begin{align*}
&\text{a. } [\text{DP} \_1[\text{DP} \_2 \text{THE}^D <<e>>_D \text{THE}^T ] \text{NP (dog's)} ] <<e>>_D \text{THE}^T ] \text{NP (tail)} ] \\
&\text{b. } [\text{DP} \_1[\text{DP} \_2 \text{PRO/John} ] <<e>>_D \text{NP (awareness)} ]
\end{align*}
\]

\[(52)\]
\[
\begin{align*}
&\text{a. } *[\text{DP} \_1[\text{DP} \_2 \text{THE}^D \_2 <<e>>_D \text{THE}^T ] \text{NP (dog's)} ] \text{THE}^D \_1 <<e>>_D ] \text{NP (tail)} ] \\
&\text{b. } *[\text{DP} \_1[\text{DP} \_2 \text{THE}^D \_2 <<e>>_D \text{THE}^T ] \text{NP (dog's)} ] \text{THE}^D \_1 <<e>>_D ] \text{NP (tail)} ]
\end{align*}
\]

\(^{13}\) Although we note that it could presumably interfere with the assignment of null case thereby likewise barring the co-occurrence of PRO and an article in D.
We note, finally, that if, indeed, an argument in Spec,D perforce assigns range to 
\[ e \], then insofar as the PRO/pro postulated for (45) is generic, the S-nominal in
its entirety should be construed as generic, which clearly is the case. We also note that
insofar as the ungrammaticality of (34) derives either from the absence of a subject, or
alternatively from the competition between a PRO-subject in Spec,D and an article,
that ungrammaticality, especially when combined with the grammaticality of (45),
suggests rather strongly that null pronouns, if indeed licit in derived nominals, may
either occur in Spec,D (as PRO), or else as the implicit subject of passive. No other
options are available.14

5.4 Passive in Broad Strokes

In attempting to elucidate what I mean by “passive”, I will assume that the analytic
form of passive in English (as well as e.g. Romance) signifies the existence, in passive,
of an embedded, dependent (sub)event, a little E, or e, possibly implicated not only in
the emergence of passive, but also in the emergence of other participial constructions.
That passive is in some sense “bi-clausal” is also the intuition put forth in Baker,
Johnson, and Roberts (1999). According to this intuition, there exists, at the core of
passive constructions, an active (sub-)event, which is in turn embedded under some
operator, call it (Passive) Voice (P-Voice or P-Vc), and it is the latter operator which
gives rise to the particular properties associated with passive, most notably the
elimination of objective case, whether accusative or partitive. Fundamentally, then,
it is the “lower” (sub-)event, e, that is implicated in the emergence of an Originator reading. Diverging from Baker et al. (who in turn followed Jaeggli 1986 on this point), I will assume that participial morphology is not, in and of itself, a recipient of the external role, but rather reflects language-specific realization properties associated with embedded sub-events. Specifically, in some grammars, and regardless of the presence or absence of an intermediate P-Vc, e may not merge with T (or with g-asp, when present), thereby resulting in the need for an auxiliary. From this perspective, participial marking is but the spellout of the verbal form in the context of such an auxiliary, as illustrated in (53), and would, presumably, be likewise spelled out in other contexts which involve e, but not necessarily passive, such as perfect contexts:

(53) \[ \begin{array}{ll}
& \text{aux} \quad \text{aux} \quad \text{V}^{\text{e},P-Vc} \quad \text{DP}_2 \\
\text{NOM} & \text{P-Vc}^{\text{e},-ptc} \quad \text{DP}_1 \quad \text{V}^{\text{e}} \quad \text{ASP}_Q \quad \text{S-o-Q} \quad \text{E}^{\text{c}=?} \\
\end{array} \]

In (53), a quantity structure, neither DP1 nor DP2 have case. Concerning DP1, our quantity object, I will assume along familiar lines that the movement of V to P-Vc extends the local domain of DP1, thereby allowing it to move to Spec,P-Vc over DP2, and subsequently to Spec,T where it receives nominative case, and then on, presumably, to Spec,E (and see fn. 17 on movement to Spec,E). In turn, it is precisely the merger of DP1 in Spec,P-Vc that results in the predication relationship between DP1

Jaeggli (1986) proposes that passive participial morphology is a clitic, of sorts, which absorbs the external thematic role, and that its co-occurrence with a by-phrase should thus be analyzed as a case of clitic doubling. This proposal, albeit within a different structural configuration, is adopted by Baker et al. (1989). This claim, however, is rejected here. Note now that the issue is independent of how the relationship between clitics and argumenthood is analyzed. Jaeggli as well as Baker et al. assume that clitics may receive an argumental interpretation directly, and by extension, so can participial morphology. Other analyses of clitics (e.g. Borer 1984; Borer and Wexler 1992; Sportiche 1993) assume instead that clitics license an otherwise null DP, itself the recipient of the relevant role. Within a clitic approach to passive, this would translate to the claim that participial morphology may license a pro which itself may be the external argument. If, however, participial morphology is altogether disassociated from the properties of passive and is but an epiphenomenon, as I suggest, that execution, likewise, must be rejected. From the perspective of the analysis to be sketched here, the participial marking in the passive is a default spellout of the verbal form in the absence of merger with T, and its particular morphological spellout does not commit us to the claim that passive is aspectually marked (e.g. as a perfect, given the identical participle) or that it necessarily entails a result interpretation of some kind.

That passive clauses are not instances of, e.g., the perfect and do not entail a result is in turn independently justified. Thus note that the -en participles in passive may be embedded under BE-\textit{-ing}, thereby giving rise to a progressive passive reading, as in (ia), with neither perfect nor result interpretation emerging. They may not, however, dominate an -\textit{-ing} participle while retaining a passive reading (cf. ib). The exact opposite holds in non-passive contexts, where an active participle with a progressive interpretation may be embedded under a perfect participle, but the converse is impossible (cf. iia–b):

(i) a. The labor force is being destroyed. (passive)
   b. the labor force has been destroying (*passive)

(ii) a. The management has been destroying the labor force. (*passive)
   b. *the management is having destroyed (the labor force)

The analysis can be extended, note, to active participles, but this matter is set aside here as it is by and large orthogonal to our plot. For an enlightening diverging perspective on participle-related matters, see Embick (2004).
and a passivized clause. Recall, before proceeding, that roles assigned to arguments are entailments from event structure, and are not essential, in and of themselves, for event interpretation to emerge. Thus E need not assign an Originator role altogether (e.g. in it rained), and a referring DP in its specifier is interpreted as an Originator only if it is not already otherwise assigned a role.

(54) is an illustration of a derivation in which DP2 is assigned Originator in Spec,e and then stays put, but DP1, otherwise assigned Subject-of-Quantity in Spec, ASP_Q re-merges first with P-Vc, then with T, where it receives NOM, and finally with E (I return below to the status of DP2). The result is a rather classical case of passive:

(54) a. \[
\text{E } \text{DP}_1 \text{ be } [T_{\text{NOM}} \text{ DP}_1 \text{ be } [P_{\text{Vc}} \text{ DP}_1 \text{ V}^{e_p_{\text{Vc}}-\text{ptc}} \text{ [e } \text{ DP}_2 \text{ V}^e \text{ ASP_Q } \text{ DP}_1 \text{ V } [C=v \text{ Ori-tor } S-o-Q]}
\]

b. The labor force was destroyed.

The boat was attacked.

We now turn to non-quantity transitives, where there is no ASP_Q, but rather, an internal argument merges with F_{SHL} where it receivesprt case. By assumption, recall, F_{SHL} is semantically vacuous, and an argument in its specifier, if not otherwise assigned a role, is interpreted as a Participant, a role which is not computed from the local syntactic context, but rather based on the entire event representation. Furthermore, recall that being semantically vacuous, F_{SHL} is licensed solely through its case assignment function, rather on a par with of in the nominal domain. As such, it is only licit if it can discharge its case function, i.e. if it has a prt-marked specifier.

In view of all this, the derivations in (55a–b) are ungrammatical. Specifically, if F_{SHL} is present in the structure as in (55a), the argument in its specifier, DP1, perforce receivesprt case. However, by assumption P-Vc is incompatible with objective case. Furthermore, we note that if DP1 is to move (via Spec,P-Vc) to merge with T, it would be doubly marked as both prt and NOM and the derivation would crash. If, alternatively, it fails to be marked as NOM (or fails to move altogether), the derivation will crash under the assumption that NOM assignment is effectively obligatory in English tensed clauses (see fn. 17). If, finally, it fails to receive prt and only receives NOM, the derivation would crash nonetheless, because F_{SHL} would not be assigning case and would hence be illicit. The alternative in (55b) avoids all these pitfalls by merging the default Participant argument directly with P-Vc and then moving it to T, where it receives NOM, and in failing to merge F_{SHL} altogether. It crashes, nonetheless, once DP1 merges with E, where, perforce, it is interpreted as an Originator, being a referring expression which is otherwise not assigned a role. The derivation is now illicit because the event in its entirety has two distinctly indexed Originators:16

16 The reader is referred to Borer (2005b) as well as to section 3 of Chapter 2 for a discussion of the fuller system. Making explicit the claims about case, I assume that NOM is assigned either in Spec,T, or, by Agree, in some lower specifier (e.g. Spec,ASP_Q for post-verbal unaccusatives where licit). An argument in Spec, ASP_Q may be optionally realized as ACC. Crucially,prt case assignment is only obligatory when F_{SHL} projects, and NOM is obligatory in the presence of T. Because ASP_Q is semantically contentful, it need not assign case. Caseless DPs, however, are illicit.
(55) a. *[^E \[T \[DP 1 \text{be} \[P-Vc \[DP 1 \text{V-ptc} \[e \[DP 2 \text{V} \[F_{\text{PRT}} \[DP 1 \text{V} \[C=V \text{PRT, Participant}

b. *[^E \[T \[DP 1 \text{be} \[P-Vc \[DP 1 \text{V-ptc} \[e \[DP 2 \text{V} \rightarrow \text{Ori-tor} \[C=V \text{Ori-tor}]

Non-quantity passive is, however, licit, and fortunately a converging derivation is available, if DP1 merges directly with P-Vc and moves to T but fails to re-merge with E. In such a derivation it receives NOM in Spec,T, but fails to receive a role locally. As it now fails to be locally associated with any role, it must be interpreted in the context of the event as a whole, i.e. as an event Participant:¹⁷

(56) a. \{[^E \[T \[DP 1 \text{be} \[P-Vc \[DP 1 \text{V-ptc} \[e \[DP 2 \text{V} \[C=V \text{Participant}

b. The car was driven (for three hours).
Poems were recited and songs were sung all day.

Note now that English does not make available any structural case for a DP in Spec.e. Unlike inherent case assigned by an assortment of semantically specialized prepositions or case particles, structural case comes at a premium. In accusative languages, at most three such structural case positions are available. One is linked to T (NOM), the second is in an objective position (ACC or PRP) and finally, a third structural case is plausibly associated with DAT in the context of an additional node (possibly PATH). No structural case is thus available for the Originator in Spec.e. It could be phonologically realized if a preposition such as by is available to assign inherent, semantically specialized case to it. Alternatively, it must remain null, a pro, in this case existentially bound by the sub-event argument heading e, itself, by assumption, dependent on the event argument in E and bound by it.¹⁸

The approach to passive sketched above, and specifically the severing of participial morphology from the passive function, now receives independent support from the existence of passive constructions without participial morphology. At least one case

¹⁷ In Borer (2005b, 2010) I argue that the (appearance) of obligatoriness for a filled Spec,E, to the extent attested, derives from the need of the event argument to be existentially closed. In turn, the obligatoriness of NOM in tensed clauses follows from the fact that movement to Spec,E must be through Spec,T. These considerations notwithstanding, I also illustrate that when the event argument can be existentially closed without a filled Spec,E, a licit derivation may emerge. The matter, we note, is largely theory-internal, and I will thus assume without further discussion that cases such as (56) do allow for such existential closure, as a fuller discussion is largely orthogonal to the structure of derived nominals or the syntax-morphology interface, where T is altogether absent. See references for a detailed discussion.

Note that to the extent that auxiliaries in English do (re-)merge overtly rather high in the tree, the derivation in (56) presupposes that the overt movement of be (or a modal) may be just to T, although I do assume that covert movement would be raising such an auxiliary or a modal to E and then further on to C.

¹⁸ Note that if DP2, the Originator, were to raise to Spec,T in the presence of P-Vc, the derivation would crash because DP1 would not be able to get case, as P-Vc is incompatible with objective case. The inevitable conclusion, and one fully compatible with the properties of passive in accusative languages, is that an argument in Spec,E or Spec,e may be a pro which is existentially bound by E or e, but not so an argument in Spec,ASPQ, or an argument in Spec,P-Vc. Insofar as such a pro is licensed exactly when it is in the specifier of an event node, be it e or E, this conclusion is fully represented in the structures proposed.
frequently discussed in the literature concerns that of Romance causatives, in which a clause embedded under the causative verb in, e.g., French or Spanish displays all the diagnostics of passive, but is missing participial morphology or any other morphological marking that may mark it as such (see Kayne 1975 and Postal 1992, i.a.). Thus consider the French cases in (57):

(57) a. Marie fera laver le chien à Jean.
Marie make.FUT wash the dog to Jean
'Marie will cause Jean to wash the dog.'
b. Marie fera laver le chien par Jean.
Marie make.FUT wash the dog by Jean
'Marie will cause the dog to be washed by Jean.'
c. Marie fera laver le chien.
Marie make.FUT wash the dog
'Marie will cause the dog to be washed.'

As Kayne (1975) points out, the behavior of faire-par constructions is identical to that of passives, with one sole exception—the marking on the “passivized” verb is an infinitive rather than participial. That the constructions are alike receives additional support from their identical behavior in the contexts of non-passivizable idioms:

(58) a. Sa famille a cassé la croûte.
his family has broken the crust
'His family had a snack.'
b. Jean a fait casser la croûte à sa famille.
Jean has made break the crust to his family

(59) a. *La croûte a été cassée par sa famille.
the crust has been broken by his family
b. *Jean a fait casser la croûte par sa famille.
c. *Jean a fait casser la croûte.
((59a–c) literal reading only)

In the account sketched above, recall, participial morphology is the result of the non-availability, in some grammars, of the movement of e to T, thereby necessitating the merger of an auxiliary, and a subsequent participial marking on the verb. Significantly, although, e.g., French does require participial constructions when passive is embedded directly under T, no participial marking is required in the embedded passives in (57b, c), precisely because the “passive” clause doesn’t include T, and is rather dependent on the T node that dominates faire. The emerging structure would thus be as in (60a) or (60b), depending on the specific type of events implicated (note that DP1 must move to receive (matrix) objective case. Further V movement is needed past DP1 and is omitted from the representation):

(60) a. **fais[ASPq/F][ASPq/F]DP1 faire [a P-Vc]DP1 V-ptc [e] DP2 V [ASPq DP1 V]c=v Ori-tor
b. **fais[ASPq/F][ASPq/F]DP1 faire [a P-Vc]DP1 V-ptc [e] DP2 V [c=v Ori-tor
An analysis of passive which is not contingent on the presence of participial morphology is further capable of giving a unified account to passive as it is attested in participial contexts and passive as it is attested in languages with synthetic passive, such as Semitic, where the properties of passive constructions are structurally virtually identical to those attested in participial languages, but in lieu of a participial form, we find a specific verbal morphology associated with verbal passive instantiations. If Semitic languages do allow the merger of e with T, the emerging derivation would be as in (61), in turn exemplified in (62). Note that unlike e.g. English or French, P-Vc is morphologically marked (and see Chapter 11 for further discussion of the Semitic picture):19

(61) a. \[ [e \text{DP}_1 \text{V-PASS} [T \text{DP}_1 \text{V-PASS} [P,V_c ] \text{DP}_1 \text{V-PASS} ] \text{DP}_2 \text{V} [\text{ASP}_Q \text{DP}_1 \text{V} [c=v ] \text{Ori-tor} ]] \text{S-o-Q}\]

b. \[
[ [e \text{DP}_1 \text{V-PASS} [T \text{DP}_1 \text{V-PASS} [P,V_c ] \text{DP}_1 \text{V-PASS} ] \text{DP}_2 \text{V} [c=v ] \text{Ori-tor} ]] \text{Participant}
\]

(62) a. ha.qbarnit šuxrar be-xaci ša?a

the.captain released.pass in-half hour

'The captain was released in half an hour.'

π\text{šxrr}; template III; active form šixrer

b. Baghdad hupceca (?al ye'dey ha.ma'tos) be-mešek xaci ša?a

Baghdad bombed.pass (by the.plane) during half hour

'Baghdad was bombed by the plane for half an hour.'

π\text{pcc}; template V; active form(fem.) hîpqica

5.5 A Passive Analysis for AS-nominals

5.5.1 Quantity structures

Armed with the argument, in section 5.1, against PRO derivations for (definite) Short AS-nominals as well as with the arguments for a passive analysis in sections 5.2 and 5.3, and having put in place an outline of an analysis for passive in section 5.4, let us turn our attention first to the passive derivation of quantity Short AS-nominals, that is, nominals whose event structure contains an ASP_Q node. In Chapter 4 I suggested that (Long) quantity transitive AS-nominals have the structure in (63) (irrelevant details omitted). Recall that as discussed at some length in that chapter, in English they may not be associated with nominalizing ING, because ING is incompatible with ASP_Q. The derivation in (63) is thus not available with ING_N[V]:

19 Both active and passive verbs in Semitic are associated with participles (active and passive respectively), and both participles are ambiguous between a verbal and an adjectival reading. In their verbal contexts, the use of the participle usually marks the presence of a modal:

(i) a. Rani haya mebbiel ‘et ha.clí lu hayit mebi’a lo sir

Rani was cook-act ptc om the.stew if were.you bring to.him pot

‘Rani would have cooked the stew had you brought him a pot.’

b. ha.clí haya mebbüsal b-a.zman (?al-yedey ha.tabas) lu hayu laru sirim mat’înim

the.stew was cook-pass ptc in time (by the cook) if were.to.us pots suitable

‘The stew would have been cooked on time (by the cook) had we had appropriate pots’. For some more relevant comments on Hebrew passive constructions, see section 5.7.
a. Active derivation, transitive, Quantity (English):
\[ [D \ V-C_{N[V]} \ [N \ V-C_{N[V]}] \ [E \ DP_2 \ V \ [ASP_Q \ of\-DP_1 \ V \ [C=V] ] ] ]

b. Active derivation, transitive, Quantity (Hebrew):
\[ [D \ V-C_{N[V]} \ [EXS-N] \ [E] \ DP_2 \ V \ [ASP_Q \ of\-DP_1 \ V \ [C=V] ] ]

Recall further that in the absence of two direct arguments, the understood subject in English need not raise to Spec,D, but may be of-marked in the very same position where šel-marked DPs are routinely found in Hebrew AS-nominals. For quantity structures, this is best illustrated by AS-nominals of unaccusatives, as in (64), exemplified in (65):

(64) Active derivation, unaccusative (English):
\[ [D \ DP_1\{'[E_{EXS-N} \ [E_{EXS-N}] \ ] \ [N \ V-C_{N[V]}] \ [E] \ [ASP_Q \ DP_1 \ V \ [C=V \ C=V] ] ] ] \]

(65) a. the frequent disintegration of the economy
b. the economy’s frequent disintegration

Suppose now we attempt to augment the structure for transitive (quantity) AS-nominals with a passive structure, in an attempt to yield the Short nominals in (66), (67), and focusing, for the time being, on cases where the understood subject in English as well as in Hebrew is post-nominal:

(66) a. the formation of the complex molecule (by the scientist)
b. the deferment of the loan payment (by the bank)
c. the dismissal of the whistle blower (by the management)
d. the fermentation of the yeast (by the brewery)

(67) a. ha.harisa šel ha.?ir (ʔal yedey ha.oyeb)
the.destruction of the.city (by the.enemy)
b. ha.pinnui šel ha.mitnaxalim (ʔal yedey ha.caba)
the.evacuation of the.settlers (by the.army)
c. ha.haqdama šel ha.bxinot (ʔal yedey cevet ha.faculta)
the.advancing of the.exams (by team the.faculty)

Crucially, recall, neither T nor g-ASP merge within AS-nominals. At the point at which the verb or the V-equivalent root move to merge with e, then, the structure is as in (68) (N movement omitted):

(68) \[ [D \ [E_{EXS-N2} \ [E_{EXS-N1}] \ [N \ C_{N[V]}] \ [E] \ DP_1 \ [p_{-VC} \ DP_1 \ [e \ DP_2 \ [ASP_Q \ DP_1 \ [Ori-tor \ S-o-Q]]] ] ] ]

Verb movement in clausal passive in English, recall, is blocked by the impossibility of e-to T (or e-to g-ASP) movement. As in AS-nominals T as well as g-ASP are altogether missing, there is little to block the movement of the verb further up, so as to merge with C_{N[V]} in both English and Hebrew, in turn giving rise to the derivation
in (69). As noted in Chapter 4, section 1, additional N movement would be required in both English and Hebrew so as to place the N to the left of the of/šel DP. While in Hebrew such movement would land the N in D, in English it would land it, presumably, in some lower head, a matter that is set aside in (69). Note that (69) gives us directly the correct word order, the correct case-marking availability, as well as the correct constituent structure for the AS-nominals in (66)–(67):

\[
\begin{align*}
\text{(69)} & \quad \text{[D [ExS-N2 \quad [N [VeP-Vc] - C_N(V)]]]_{ExS-N1} of DP1 \quad [N [VeP-Vc] - C_N(V)]]_{DP1} V_{P-Vc} \quad Ori-tor \quad S-o-Q} \\
& \quad \text{[P-Vc DP1 V_{P-Vc} \quad \_ DP2 \quad Ve V[\_ ASPQ DP1 \quad E - DP1 V}]_{C=V - ...} \quad S-o-Q}
\end{align*}
\]

It is worthwhile pausing at this point to consider a comparison between the structure of Short, passive AS-nominals and unaccusative nominals, especially as it has been proposed (cf. Alexiadou 2009; Sichel 2010) that Short nominals are, in actuality, instances of unaccusative nominals. The relevant comparison class consists of cases such as those in (70), with the structure in (71) (see Chapter 4, section 8 for discussion):

(70)  
a. the arrival of the train  
b. the accumulation of dust [intransitive reading]  
c. the unification of the workers [intransitive reading]  
d. the disappearance of the rabbit  
e. the eruption of the volcano

(71)  
Unaccusatives (quantity), post-N DP:

\[
\text{[D [ExS-N1 V - C_N(V)]]_{ExS-N2} of DP1 \quad [N V - C_N(V)] \quad E - DP1 V \quad [ASPQ DP1 V}]_{C=V - ...} \quad S-o-Q}
\]

Although the configurations display similarity, precisely insofar as unaccusatives and passives both involve the promotion of an “internal” argument, I believe that reducing the cases in (66)–(67) to the cases in (70) gives rise to more problems than it solves. While it is true that passive AS-nominals display some properties which distinguish them from passives within clausal VPs, and to which I turn shortly, it is also the case that they remain distinct from unaccusative nominalizations along exactly the same dimensions which distinguish passive clauses from unaccusative ones: the former, but not the latter, allow a by-phrase (cf. the ungrammaticality of (72a)); the former, but not the latter, allow an implicit argument control (cf. the ungrammaticality of (72b, d)). Moreover, and quite crucially, Short AS-nominals are ambiguous, where relevant, between an unaccusative and a transitive reading, a systematic ambiguity that simply cannot be captured with a single structure (cf. 73).20

20 More frequently than not, the fact that growth excludes a transitive reading is the cornerstone of analyses that seek to reduce all short nominalizations to cases of unaccusatives. As (73) shows, and as argued explicitly by Harley and Noyer (1998a, b), the behavior of growth does not generalize. I return to the properties of growth in Chapter 7, section 3.4.
(72)  a. the arrival of the train (*by the conductor)
    b. the accumulation of dust (*in order to grow tomatoes) [when intransitive]
    c. the separation of the cream (in order to make the cake) [transitive reading only]
    d. the separation of the cream (*in order to make the cake) [when intransitive]

(73)  a. the separation of the cream [ambiguous]
    b. the accumulation of dust [ambiguous]
    c. the unification of Germany [ambiguous]
    d. the crystallization of sugar [ambiguous]
    e. the fermentation of the yeast [ambiguous]

Finally, while AS-ING nominals are possible with passive Short nominals (cf. (1)–(2)), they are barred with unaccusative ones, as already discussed in Chapter 4, sections 4 and 8:

(74)  a. *the arriving of the train
    b. *the ending of the rains
    c. *the erupting of the volcano
    d. *the disappearing of the rabbit

I therefore conclude that unifying the analysis of unaccusative AS-nominals and the Short AS-nominals (66), (67) is the wrong move. Insofar as unaccusative AS-nominals and Short AS-nominals do have properties in common, this follows naturally from the affinity, amply documented, between unaccusative constructions and passives. Insofar as they are distinct, giving them an identical analysis serves to blur, rather than sharpen, the distinction between them, and to further obscure important properties of AS-nominals.

5.5.2 Non-quantity structures, transitive

Non-quantity Short AS-nominals come in two varieties. The first involves Short AS-nominals with a PP complement, as in (2), to which I turn in section 5.5.3. In turn, the subject matter of this section is non-quantity cases such as English (75) or Hebrew (76), where non-quantity emerges with a “direct” object which, by assumption, is marked as _prt in long derivations or in active clausal cases:

(75)  a. the forming of complex molecular structures (by the scientist)
    b. the smelling of the stew (by Robin)
    c. the organizing of the labor force (by the union)

(76)  a. ha.ktiba šel ha.seper (מール יeday ha.balšanit) be-mešek xameš šanìm the.writing of the.book (by the.linguist) during five years
    b. ha.šippuc šel ha.binyan (מール יeday ha.qablan) be-mešek šbuʔayim the.renovation of the.building (by the.contractor) during two weeks
    c. ha.haqra’a šel ha.hora’ot (מール יeday ha.memune) be-mešek šaloš šaʔot the.reciting of the.instructions (by the.supervisor) during three hours
I concluded in Chapter 4 that English \( \text{ING}_{\text{N}[V]} \) is incompatible with a quantity event structure, and that unlike ATK, it is never aspectually neutral. As such, its properties will serve us well in investigating the properties of (transitive) Short AS-nominals which are non-quantity, although the reader should bear in mind that ATK nominals may be non-quantity, and insofar as they do correspond to Short non-quantity AS-nominals, should allow for an identical treatment.

The analysis of passive outlined in section 5.4 offered a somewhat different structure for quantity and non-quantity passives. Specifically, I proposed that in non-quantity passives the object merges directly in Spec, \( P-Vc \) (see (56a) and related discussion). As in the case of quantity derivations, let us attempt to now embed that structure within that of English AS-nominals. T, of course, fails to be present, and by assumption, E is obligatory insofar as the well-formedness of \( e \) is always contingent on its presence. The result is as in (77):

\[
(77) \quad [D \quad [\text{ExS-N}_2] \quad [N \quad [\text{ExS-N}_1] \quad [N \quad V-C_{N[V]}] \quad [E \quad [P-V_c] \quad DP_1 \quad V \quad [e \quad DP_2 \quad V \quad [c=\ldots \quad \text{Ori-tor}]]]
\]

When we turn now to the question of case, however, problems emerge. By assumption, \( DP_2 \) may be an existentially interpreted \textit{pro} excused from case-marking. \( DP_1 \), however, is in need of case, and by assumption, such case must come from some nominal specifier. On a par with the quantity Short derivation, suppose we assume that \( DP_1 \) moves up to receive such case, as in (78). However, (78) is not a licit derivation. The reason is that \( DP_1 \), in Spec, \( P-V_c \), is not assigned a role and would thus be interpreted as an event \textit{Participant} in the context of the entire event, if it were to stay put. If, however, it were to attempt to reach Spec,ExS-N\(_1\) where it could be of-marked, it would need to land in Spec,E en route. Once landing in Spec,E, however, it would inevitably be assigned an \textit{Originator} role. As there is already a (distinct) \textit{Originator} to the event, the derivation would crash (and see the parallel illicit derivation within the verbal domain in (55b)):

\[
(78) \quad *[D \quad [\text{ExS-N}_2] \quad V-C_{N[V]} \quad [\text{ExS-N}_1] \quad [N \quad V-C_{N[V]}] \quad [E \quad [P-V_c] \quad DP_1 \quad V \quad [e \quad DP_2 \quad V \quad [c=\ldots \quad \text{Ori-tor}]]] \quad \rightarrow \text{Ori-tor} \quad \rightarrow \text{Ori-tor}
\]

A similar problem would plague the Hebrew derivation. While objective case (marked by \textit{et} for definites and proper names) is available in Long, active derivations, it is not available in Short AS-nominals, a fact which we already took to support their passive derivation. Likewise, then, an object in Hebrew is in need of case, but its movement to where such case is available would force it to merge in Spec, E on the way, with the consequences already outlined for English.

Case for \( DP_1 \)—without forcing it to merge with E—is available, however, if we assume that it could be accomplished through \textit{Agree}, thus rendering the passive derivation in (79) akin to their clausal correlates in (80), where case is assigned by T through \textit{Agree} (cf. the schematic configuration in (81)). In turn, the obligatory presence, in English clauses (but not in Hebrew) of an expletive together with the well-known definiteness restriction attested in such cases would need to emerge from
some T-specific property such as EPP or a formal equivalent. In the context in (79), finally, DP1 is an event Participant—in the presence of a full event structure and a specified Originator, and as discussed in some detail in Borer (2005b), the assignment of a unique argumental role to such a participant is a trivial algebraic matter:21

\[
\begin{align*}
&\text{(79):} & & [D \ \text{exs-N} & & \text{V-CN[v]} & & [\text{exs-N} & & \text{exs-Nofiel} & & \text{V-CN[v]} & & [\text{p-Vc} & & \text{offiel} & & \text{DP1}] & & \text{v} & & \text{e} & & \text{DP2} & & \text{V} & & \text{c=v} & & \ldots & & \text{Agree Participant Ori-tor} \\
\end{align*}
\]

\[
\begin{align*}
&\text{(80):} & & \text{a. (There) were three men fired.} \\
& & & \text{b. puṭṭru sloša ‘anašim} \\
& & & \text{fired.pas three men} \\
\end{align*}
\]

\[
\begin{align*}
&\text{(81):} & & [E \ \text{T} & & \ldots & & [\text{p-Vc} & & \text{DP1} & & \text{V} & & \text{e} & & \text{DP2} & & \text{V} & & \text{ASPQ} & & \text{V} & & \text{c=v} & & \ldots \text{ASPQ} & & \text{V} & & \text{S-o-Q} & & \text{Agree Ori-tor}] \\
\end{align*}
\]

5.5.3 Non-quantity structures, PP-complements

Consider finally the cases in (82)–(83):

\[
\begin{align*}
&\text{(82):} & & \text{a. the (organized) reaction to the austerity measures (by the Greek population)} \\
& & & \text{b. the (repeated) voting against the bill (by the young Republicans)} \\
&\text{(83):} & & \text{a. ha.hacba?a neged ha.xoq (ʔal yedey miplagot ha.opozicia)} \\
& & & \text{the.voting against the.law (by the parties the.opposition)} \\
& & & \text{b. ha.pgi?a be-xopeš ha.dibbur (ʔal yedey ha.xaqiqa ha.nokexit)} \\
& & & \text{the.hurting in-freedom the.speech (by the.legislation the.present)} \\
& & & \text{‘the blow to the freedom of speech (by the present legislation)’} \\
\end{align*}
\]

Note, specifically, that no promotion is involved in the case of (82)–(83), nor is there a case issue. The complement in these cases is marked by an inherent preposition which is not lost in the Short derivation. The configuration is a familiar one, and is associated with impersonal passives, attested productively in German, Dutch, Venetian, Serbian, and many other languages:

\[
\begin{align*}
&\text{(84):} & & \text{a. In de tuin wordt gedanst.} \\
& & & \text{in the garden become.sg danced} \\
& & & \text{‘There was dancing going on in the garden.’} \\
& & & \text{b. Op zijn begrafenis is gedanst.} \\
& & & \text{at his funeral is danced} \\
& & & \text{‘There was dancing at his funeral.’} \\
& & & \text{(Dutch, Verrips 1996; Wijnen and Verrips 1998)} \\
\end{align*}
\]

21 Specifically, I assume that Spec,P-Vc is accessible to Agree, but not so Spec,e. Note that this assumption suffices to account for the contrast between (80b) and (i) in English:

\[
\begin{align*}
&\text{(i):} & & \text{‘There were fired three men.} \\
\end{align*}
\]
English and Hebrew, at the center of our discussion of AS-nominals, do have impersonal passives, although they are more restricted.\textsuperscript{22}

Impersonal passives do not have active transitive correlates, and as has been noted in Perlmutter (1978) (and as based on impersonal passives in Dutch) are atelic, i.e. non-quantity, and as such, are excluded as unaccusatives. That the classification

\textsuperscript{22} By-phrases in impersonal passives are further restricted, even in cases where the construction is otherwise allowed. Thus note the marginality of some by-phrases in impersonal cases in Hebrew (cf. (88)). As Schoof (2003) observes, Venetian, which otherwise allows impersonal passives, likewise does not allow by-phrases in that context. In turn, it has been independently argued that at least in Hebrew, by-phrases are restricted to agentive and instrumentals (cf. especially Alexiadou and Doron 2012), a point already touched upon in Chapter 3, section 4. I will proceed to assume that the occurrence of a by-phrase, at least in Hebrew and Romance, does indicate the presence of passive, but that its impossibility or marginality do not suffice to establish the non-passive status of the clause under consideration.
concerns event types, rather than verbs as such, is also further noted by Perlmutter, who cites the grammaticality of (89), with the verb fallen ‘fall’, typically occurring in unaccusative contexts, but nonetheless grammatical in impersonal passive constructions providing the event as a whole is construed as having an Originator. To cast it in Perlmutter’s exact terms, impersonal passives are possible whenever the verb’s (single direct) argument (albeit at times covert) is controlling the activity:

(89) a. In het tweede bedrijf werd er door de nieuwe acteur op het juiste ogenblik gevallen.
    in the second act become.sg there by the new actor fallen
    ‘In the second act, the actor fell at exactly the right moment.’ (Perlmutter 1978)

b. In deze uitvoering wordt door de sopraan op magistrale wijze gestorven.
    in this performance become by the soprano in majestic fashion dies
    ‘In this performance, the soprano dies in majestic fashion.’ (Verrips 1996)

In turn, (90a–b), with a quantity interpretation, are ruled out (or are anomalous), and the nice minimal contrast in (91a–b) is noted by Verrips (1996), who likewise concludes that impersonal passives are always atelic:

(90) a. *In dit weeshuis wordt door de dinderen erg snel gegroeid.
    in this orphanage become.sg. by the children very fast grown

b. *In de zomer wordt hier door de kinderen verdronken.
    in the summer become.sg here by the children drowned

(91) a. Er werd door de kinderen lekker op het ijs gegleden.
    there became by the children nicely on the ice slid
    ‘The children enjoyed sliding on the ice.’

b. *Er werd door de sneeuw van het dak gegleden.
    there became by the snow off the roof slid

Her conclusion is further supported by the availability of atelic, but not telic, aspectual modification exemplified in (92):

(92) a. er werd urenlang/*in een uur gedanst
    there became for hours/*in an hour danced

b. hier wordt door menigeen urenlang/*in een uur gewandeld
    here become.sg by many for hours/*in an hour walked

In turn, and from the perspective of the structures adopted in this work, the absence of a quantity reading for impersonal passive is hardly problematic. Suppose, specifically, that the structure of impersonal passive is as in (93a). An attempt to embed an ASP_Q node in (93a), e.g. as in (93b), would in turn result in an illicit derivation because in the absence of either a particle of a quantity DP, \( \langle c \rangle_{ASP_Q} \) cannot be assigned range (or, following the logic in Chapters 1 and 6, in the absence of an appropriate value, \( \langle c \rangle_{ASP_Q} \) can never project as ASP_Q):
Finally, embedding the (licit) impersonal passive structure in (93a) within AS-nominals, so as to yield the cases in (82)–(83), would give rise to the licit, and non-quantity, configuration in (94):

\[
\begin{align*}
(94) & & [D \ [ExS-N \ [V-CN \ [V] \ N \ [ExS-N \ [N \ V-CN \ [V] \ [E \ V \ [e \ DP_1 \ V \ [C=V \ C=V \ldots \ (PP) \\
& & [P-VC \ V\text{-ptc} \ [e \ DP_1 \ V \ [C=V \ C=V \ldots \ (PP).]
\end{align*}
\]

The derivation of the short AS-nominals in (82)–(83), then, is rather straightforward, and unlike the case of non-quantity transitives, no case complications emerge, as the complement is inherently case-marked by a preposition which is retained in the passive variety.

One may object, at this point, based on the fact that impersonal passive, by assumption implicated in the derivation of (82)–(83), is not attested in their clausal correlates, in either English or Hebrew:23

\[
\begin{align*}
(95) & & *[i/t\text{-there}] \text{ was reacted to the austerity measures (by the Greek population)} \\
& & *[i/t\text{-there}] \text{ was voted against the bill (by the young Republicans)}
\end{align*}
\]

23 At least in English, the limitations on impersonal passive in clausal constructions may correlate with the availability of so-called "pseudo-passives", as in (i). In the absence of preposition stranding of any kind in Hebrew, these are not available:

(i) a. The austerity measures were (strongly) reacted to (by the Greek population).
   b. The bill was (yet again) voted against (by the young Republicans).
   c. The bed was slept in (by the youngest bear).
   d. The resolution was talked about (by the press).

Pseudo-passive is not available in AS-nominals, as the strong ungrammaticality of (ii) illustrates:

(ii) a. *the reaction of the austerity measures to (by the Greek population)
   b. *the voting of the bill against (by the young Republicans)
   c. *the sleeping of the bed in (by the youngest bear)

(iii) a. *the reaction to of the austerity measures (by the Greek population)
   b. *the voting against of the bill (by the young Republicans)
   c. *the sleeping in of the bed (by the youngest bear)

Insofar as pseudo-passives are typically analyzed as cases of reanalysis, the cases in (ii) are directly excluded. Under the plausible assumption that reanalysis with N is blocked, and that reanalyzed forms cannot incorporate with a nominal suffix, this would account for the ungrammaticality of (iii).

The cases in (iii) present an interesting contrast with cases of compounded particles, as in (iv) (see Chapter 4, section 7 for some discussion), thereby suggesting that the grammar of compounded particles in particular and of compounds in general cannot be equated with whatever reanalysis may license pseudo-passive:

(iv) a. the pulling apart of the structure
   b. the breaking down of law and order
   c. the putting together of the grant proposal
   d. the splitting up of the twins
The objection, while potentially valid, is nonetheless extremely hard to evaluate in the absence of a clearer picture of what licenses impersonal passive to begin with, and what grammatical factors conspire to make clausal impersonal passive fully productive in some languages but not in others. Specifically, we note, and insofar as UG does allow for impersonal passives, it is their absence in some contexts that is in need of explanation, rather than their presence, and so, by Occam’s Razor, the presence of the impersonal passive in AS-nominals is not in need of explanation. Rather, it is the ungrammaticality of (95)–(96) that is puzzling. Typically, the customary practice is to appeal to lexical listing whenever the properties of clausal (Extended) VPs and the properties of AS-nominals do not match. In the case under consideration, and given the availability of the impersonal passive in UG, it is the properties of the clausal VPs that are deviant, and hence in need of “listing”, rather than the properties of AS-nominals, thereby hardly providing evidence for the listedness of the latter. Finally, we note that even under the account of AS-nominals offered here, structural distinctions do remain between the internal structure of clauses and the internal structure of AS-nominals, which manifest themselves in a distinct array of functional nodes and in the crucial presence, for AS-nominals, of directly dominating nominal ExP-segments. It thus emerges that any account of the limitations on impersonal passive in clauses in English and Hebrew must avail itself of these specific structural factors in seeking an explanation.

5.5.4 Hebrew, supplemental: scope, potential objections, and conative variants

5.5.4.1 The scope of arguments As was demonstrated for English following van Hout and Roeper (1998), so in Hebrew, scope effects favor a passive analysis for Short AS-nominals. Hebrew has negative concord, and as a result the actual equivalents of (38a–b) are only licit with negation. As predicted, a negation in the matrix clause could license a negative polarity item for transitive and intransitive subjects of AS-nominals, for the sole argument of Short AS-nominals (by assumption passive), and for the subject of de-adjectival nominal. In all such cases, wide scope is the only possible option. Licensing of the object of transitive AS-nominals, however, is illicit:

(97) a. Transitive, subject

\[ \text{lo hiskamti im ha.hapara şel šum mu?amad } \text{et ha.xoq} \]

no agreed.1.sg with the.violation.TRANS of any candidate om the.law

‘I didn’t agree with any candidate’s violation of the law.’

b. Transitive, object

\[ *\text{lo hiskamti im ha.hapara šel ha.mu?amad šum xoq (šehu)}^{24} \]

no agreed.1.sg with the.violation.TRANS of any candidate any law (that is)

‘I didn’t agree with the candidate’s violation of any law.’ (that might exist)

---

24 Recall that (’et-less) light objects are barred in AS-nominals. The parenthetical material provides extra weight to ensure that the ungrammaticality is not thus triggered.
c. Intransitive, subject
\[ l\text{o} \text{ hiskamti} \text{ im} \text{ ha.hitpaṭṭrut/ha.šira} \text{ šel af exad} \]
no agreed.1.sg with the.resignation/the.singing of anybody

d. S-nominal
\[ l\text{o} \text{ hupta?ti} \text{ min} \text{ ha.ṭippšut} \text{ šel af exad} \]
no surprised.1.sg from the.stupidity of anybody

e. Short AS-nominals (passive), logical object
\[ l\text{o} \text{ hiskamti} \text{ im} \text{ ha.hapara} \text{ šel šum xoq/šum dabar} \]
no agreed.1.sg with the.violationTRANS of any law/anything

Scope ambiguities such as those attested with nobody in English can, in turn, be illustrated with indefinites. Here, exactly on a par with English, we find obligatory wide scope for subjects of transitives and intransitives in AS-nominals, and for subjects of S-nominals, but an ambiguity for the subject of Short AS-nominals. Yet again, objects allow narrow scope exclusively:

(98) a. Transitive, subject
\[ hupta?ti \text{ min} \text{ ha.hapara} \text{ šel šney sarim} \text{ ′et} \text{ ha.xoq.} \]
surprised.1.sg from the.violation of two minister om the.law
‘There are two ministers such that it surprises me that they violated the law.’
*I was surprised that (some) two ministers violated the law.’

b. Transitive, object
\[ hupta?ti \text{ min} \text{ ha.hapara} \text{ šel Ran šney xuqim.} \]
surprised.1.sg from the.violation of Ran two laws
‘There are two laws such that it surprised me that Ran violated them.’
‘I was surprised by Ran’s violation of (some) two laws.’

c. Intransitive, subject
\[ hupta?ti \text{ min} \text{ ha.hitpaṭṭrut/ha.šira} \text{ šel šney mu?amadim.} \]
surprised.1.sg from the.resignation/the.singing of two candidates
‘There are two candidates such that their resignation/singing surprised me.’
*I was surprised that (some) two candidates resigned/sang.’

d. S-nominal
\[ hupta?ti \text{ min} \text{ ha.ṭippšut} \text{ šel šney mu?amadim.} \]
surprised.1.sg from the.stupidity of two candidates
‘There are two candidates such that their stupidity surprised me.’
*I was surprised by the stupidity of (some) two candidates.’

e. Short AS-nominals (passive), logical object
\[ hupta?ti \text{ min} \text{ ha.hapara} \text{ šel šney xuqim} \]
surprised.1.sg from the.violation of two laws
‘There are two laws such that I was surprised by the fact that they were violated.’
‘I was surprised by the violation of (some) two laws.’
As was true for English, it is clear that Hebrew Short AS-nominals do not lend themselves to an analysis which equates them with Long AS-nominals with a PRO subject—if that were the case, we would have expected exclusively narrow scope readings. Yet, equally clear is the conclusion that the single argument of Short AS-nominals, its logical object, is simultaneously an object and a subject, allowing, uniquely, both narrow and wide scope. This is exactly the picture we find in verbal passives, and is highly illustrative of reconstruction effects. As such, it lends strong structural support for viewing Short AS-nominals as cases of the passive, a conclusion otherwise amply supported.

5.5.4.2 Potential objections While the presence of VPs in AS-nominals has been endorsed by Hazout (1991, 1995) as well as by Engelhardt (1998, 2002), both, nonetheless, bring forth some arguments against analyzing Short AS-nominals in Hebrew as passives. The arguments mostly concern cases where clausal passive and Short AS-nominals part company. According to Hazout, the parallelism breaks down in two types of cases—some involve Short AS-nominals which do not have clausal passive correlates, and the others involve clausal passives that do not have Short AS-nominal correlates. As an illustration of the first case, consider the contrasts in (99)–(101):25

(99) a. ha.caba calax 'et ha.te?ala
   the.army crossed om the.canal
b. ha.saxqanim hitxilu 'et ha.hacaga
   the.actors started om the.play

(100) a.*ha.te?ala niclexa ?al yedey ha.caba
   the.canal crossed.pass by the.army
b.*ha.hacaga hutxela ?al yedey ha.saxqanim
   the.play start.pass by the.actors

(101) a. ha.clixa šel ha.te?ala be-zehirut (?al yedey ha.caba)
   the.crossing of the.canal in-carefulness (by the.army)
b. hatxalat ha.hacaga
   starting the.play

By illustration of the second case, and as already noted in Chapter 3, section 4, some verbs which select a PP complement rather than a direct object in Hebrew may nonetheless passivize. The output of such passives results, importantly, in the loss of the preposition (cf. Berman 1978). However, when we turn to the short AS-nominals corresponding to these, we discover that the preposition is retained:

25 The ungrammaticality of (100a) is as assigned by Hazout. For many speakers, including myself, the clausal passive of calax 'cross', ranges from marginal to fully grammatical.
(102) a. Dan țippel b-a.maxala
   Dan treated in-the.disease
   ‘Dan treated the disease.’

b. Dan xabaț b-a.keset
   Dan beat in-the.comforter
   ‘Dan beat the comforter.’

c ha.caba yara b-a.mapginim
the.army shot in-the.demonstrators
   ‘The army shot at the demonstrators.’

d. Rani yara b-a.totax
   Rani shot in-the.cannon
   ‘Rani shot the cannon.’

(103) a. ha.maxala țuppla (?al yedey Dan)
   the.disease treated.PASS (by Dan)
   ‘The disease was treated (by Dan).’

b. ha.keset nexbeța
   the.comforter beaten.PASS
   ‘The comforter was beaten.’

c. ha.mapginim noru (?al yedey ha.caba)
   the.demonstrators shot.PASS (by the army)
   ‘The demonstrators were shot (by the army).’

d. ha.totax nora (?al yedey ha.xayal)
   the.cannon shot.PASS (by the soldier)
   ‘The gun was shot (by the soldier).’

(104) a. ha.țippul b-a.maxala (?al yedey Dan)
   the.treatment in-the.disease (by Dan)

b. ha.xabața b-a.keset (?al yedey Dan)
   the.beating in-the.comforter (by Dan)

c. ha.yeriya b-a.mapginim (?al yedey ha.xayal)
   the.shooting in-the.demonstrators (by the soldier)

d. ha.yeriya b-a.totax (?al yedey ha.xayal)
   the.shooting in-the.cannon (by the soldier)

A closer look at the relevant cases reveals that they all represent an idiosyncrasy within the clausal domain and not within the AS-nominals domain. Suppose we consider first the contrast between the illicit clausal passive in (100) when compared with the cases in (101). We note, first, that what is under consideration is really only the asymmetry between (100a) and (101a), for the simple reason that contra Hazout’s claim, (101b) is in fact illicit as an AS-nominal, whether Short or Long, thus rendering
this case irrelevant. Rather, (101b) is only licit as an R-nominal, referring to the specific point of time that can be described as “the beginning of the play”, rather than to an actual starting event:

(105) a. *hatxalat ha.saxqanim ’et ha.hacaga \(\text{(be-mehirut)}\)
    starting the.actors om the.play (quickly)

b. hatxalat ha.hacaga \(\text{(?al yedey ha.saxqanim) (\text{(be-mehirut)}\}}\)
    starting the.play ( by the actors) ( quickly)

Turning to (100a), we note that insofar as the passive of \(\text{calax ‘cross (specifically water obstacles)’}\) is illicit for some speakers (cf. fn. 25), this appears, primarily, to be an accidental gap within the clausal passive paradigm. All the more so given the fact that its close synonym, \(\text{xaca, likewise ‘cross (in general)’}\) does give rise to unquestionably well-formed passives, as (105) shows:

(106) a. ha.caba xaca ’et ha.te?ala
    the.army crossed om the.canal

b. ha.te?ala nexceta \(\text{(?al-yedey ha.caba)}\)
    the.canal crossed.pass by the.army

c. ha.xacaya šel ha.te?ala be-mehirut \(\text{(?al yedey ha.caba)}\)
    the.crossing of the.canal in-carefulness (by the army)

I therefore believe that there is, in actuality, little of interest in the absence of a passive verbal form for \(\text{calax, it being, it would appear, an accidental morpho-phonological gap which cannot, and should not, receive a syntactic, semantic, or a morpho-syntactic explanation.}\)

5.5.4.3 Hebrew Conative Alternation and a realization gap Consider now the vanishing prepositions in (103) as well as the contrast between (103) and (104). Here, a closer investigation of the facts turns out to be quite illuminating. Importantly, there are salient meaning differences between (102) and (104), on the one hand, and (103) on the other. While the cases with an overt preposition, be it the active clausal cases or the Short AS-nominals, have an activity, non-quantity reading, the clausal passive cases in which the preposition has vanished are most salient as quantity predicates. Thus the interpretation of (103c) rather strongly implies that the demonstrators were actually hit and (103a) is not likely to be uttered unless the issue that was attended to was resolved and dispensed with. Not so with the presence of the preposition, in both

\[\text{26 One obvious possible reason for the gap may emerge from an interference from the common occurrence of derivatives of the same root, } \sqrt{\text{clx, with Content related to ‘success’. We note that the active verb, calax, is in Qal, a paradigm which lacks a dedicated morphological passive, and which is altogether riddled with item-specific morpho-phonological exceptions, a theoretical matter of some significance which I return to in considerable detail in Chapter 11.}\]
actives and AS-nominals. Here, in all likelihood, the issue still requires attention, and the demonstrators may have been shot at, but the shots may have missed.

The effects, in turn, are not surprising, and are directly reminiscent of the effects typically discussed under the heading of the “Conative Alternation” and illustrated for English in (107) (and see especially Levin 1993, for a fuller discussion):

\[(107)\]

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<td>a.</td>
<td>I pulled at/∅ the rope.</td>
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<td>b.</td>
<td>I hit at/∅ the wall.</td>
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<td>c.</td>
<td>I ate at/∅ the chicken.</td>
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<td>d.</td>
<td>I swatted at/∅ the fly.</td>
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<td>e.</td>
<td>I shot at/∅ the birds.</td>
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Descriptively, the Conative Alternation involves a (mostly) identical thematic object which is licensed either as a direct argument or as a P-object. The preposition, in English, is always at. We note that insofar as the preposition is fixed, it cannot be argued to be lexically selected by individual verbs. While it may contribute some meaning (see, for instance, Ghomeshi and Massam 1994, who propose that English at defines a path), one thing is relatively clear—in the absence of a preposition, the interpretation favors, although doesn’t mandate, a quantity construal. When the preposition is present, on the other hand, quantity interpretation is excluded. The explanation, first highlighted in Tenny (1987) (and see also S. Rosen 1999), has to do with the privileged relationship between a direct argument and telicity/quantity, first noted and analyzed in Verkuyl (1972), and specifically, in the model used here, with the fact that quantity DPs must be available in these cases in order to assign range to ASP_Q.

Hebrew, as it turns out, has a rather large paradigm which exhibits the Conative Alternation, and where the preposition in use is be-, literally ‘in’. Thus consider the cases in (108)–(109). As in English, all cases allow both a direct object variant and a be-object variant. While a quantity direct object does not bring about an obligatory quantity interpretation, such an interpretation is certainly the more salient one in its presence. In turn, when a preposition is present, quantity construal is blocked:

\[(108)\]

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<td>‘et</td>
<td>ha.šaken</td>
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<td>c.</td>
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<td>‘et</td>
<td>ha.seper</td>
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<td>d.</td>
<td>nahagti</td>
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<td>pulled.1.sg</td>
<td>om</td>
<td>the.rope</td>
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<td>b.</td>
<td>beat.1.sg</td>
<td>om</td>
<td>the.neighbor</td>
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<td>c.</td>
<td>read.1.sg</td>
<td>om</td>
<td>the.book</td>
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<td>d.</td>
<td>drove.1.sg</td>
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<td>c.</td>
<td>qarati</td>
<td>b-a.seper</td>
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<td>d.</td>
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<td>b.</td>
<td>beat.1.sg</td>
<td>in-the.drum</td>
<td></td>
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<tr>
<td>c.</td>
<td>read.1.sg</td>
<td>in-the.book</td>
<td></td>
</tr>
<tr>
<td>d.</td>
<td>drove.1.sg</td>
<td>in-the.Ford</td>
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As in English, the choice between the quantity and the non-quantity variants is context dependent. A drum is thus easier to ‘beat at’ and not so easy to ‘beat (up)’, unlike, e.g., a neighbor; a nail, on the other hand, is easier to ‘knock in’ than a door, where ‘knocking at’ seems more plausible, guiding the choice of objects in (108)–(109). Particularly telling is the different flavor for baxar, in (f), literally ‘choose’ or ‘elect’, but corresponding in its different instantiations to different English verbs, one which clearly implies a complete action, ‘choose, elect’ and the second which is considerably more consistent with activity, ‘vote for’.

When we turn to the clausal passive correlates of (108)–(109), we find that all do have a passive correlate, and that in all cases, the construal of the passive corresponds to the non-prepositional variant and favors a quantity interpretation. In turn, in all cases, the prepositional variant does not have a clausal passive correlate. Particularly illustrative of this fact is the oddity of precisely those objects which strongly favor a non-quantity reading. Note that the ‘vote for’ interpretation is not available for the passive in (110fo):

(110) a. ha.xebebil nimšak
    the.rope pulled.PASS

b. ha.šaken huka b'. #ha.top huka
    the.neighbor hit.PASS the.drum hit.PASS

c. ha.seper niqra
    the.book read.PASS

d. ha.ford ninhag
    the.Ford driven.PASS

e. ha.masmer nidpaq e'. #ha.delet nidpeqa
    the.nail knocked.PASS the.door knocked.PASS

f. ha.mu?amad nibxar
    the.candidate elected.PASS/chosen.PASS
    ‘the candidate was elected/chosen’
    ‘the candidate was voted for’

Turning to AS-nominals, we note that both Long and Short AS-nominals exhibit the full range of possibilities attested in the active. In other words, Short AS-nominals, in contrast with the clausal passive cases in (110) do have a prepositional variety. Note finally that the interpretational effects exhibited in the active cases are preserved across the board in AS-nominals (Construct forms with the logical object provided where Free forms are awkward for independent
reasons; Construct forms are excluded across the board in Semitic with PP complements): 27

(111) Long AS-nominals:

a. ha.mešika šel Rami b-/- et ha.xebel
   the.pulling of Rami in/om the rope
b. ha.haka’a šel.i b-a.top ’/et ha.šaken
   the.beating of.me in-the.drum /om the.neighbor
c. ha.qri’a šel Rami b-/-’et ha.seper
   the.reading of Rami in/om the.book
d. ha.nehiga šel.ax b-/-’et ha.mekonit
   the.driving of.you in/om the.car
e. ha.dpiqa šel Rami b-a.delet/’et ha.masmer
   the.knocking of Rami in-the.door/om the.nail
f. ha.bxira šel.anu b-a.mu?amad/’et ha.mu?amad
   the.election of.us in-the.candidate/om the.candidate

(112) Short AS-nominals:

a. ha.mešika b-’šel ha.xebel (mešikat ha.xebel)
   the.pulling in/-of the rope (pulling the.rope)
b. ha.haka’a b-a.top ’šel ha.šaken
   the.beating in-the.drum /of the.neighbor
c. ha.qri’a b-’šel ha.seper (qri’at ha.seper)
   the.reading in/-of the.book (reading the.book)
d. ha.nehiga b-’šel ha.mekonit (nehigat ha.mekonit)
   the.driving in/-of the.car (driving the.car)
e. ha.dpiqa b-a.delet/ šel ha.masmer (dpiqat ha.masmer)
   knocked in-the.door/of the.nail (knocking the.nail)
f. ha.bxira b-’šel ha.mu?amad (bxirat ha.mu?amad)
   the.election in-the/of the.candidate (election the.candidate)

There are a number of obvious conclusions from the paradigm in (108)–(112). First, we note that for all these cases, regular clausal verbal passive is derived from the preposition-less active variant, retaining its (ability to have) quantity interpretation,

27 H. Rosen (1956) argues that in argumental context, the formation of a construct between a head and an object (in the absence of a subject) is obligatory. The effect is real enough for some cases in (112), where non-constructs are quite awkward, but unfortunately, it does not generalize, as the fully grammatical cases in (i) show. An explanation is not attempted. (See fn. 15 of Chapter 3 for some related matters.)

(i) ha.gziza šel ha.se?ar; ha.hadlaqà šel ha.or; ha.hapqada šel ha.kesep
   the.shearing of the.hair; the.lighting of the.light; the.depositing of the.money; etc.
and not from the variant in which a preposition is attested. This is, of course, a fortunate result unless one wishes to endorse, universally, a process of preposition evaporation. In turn, AS-nominals, Short or Long, occur with both P-object and the direct object, and when they do, they retain whatever (non-)quantity possibilities are associated with their source variant.

Let us now return to our original paradigm in (102)–(104). When we compare the three verbs exemplified there—and to the best of my knowledge these are the only three—with the cases in (108)–(109), we find that in the active, they are associated with the P-variant and as such, they have the predictable properties. What is missing, however, is the direct object variant. Nonetheless, the clausal verbal passives in (103) must have been derived from such a variant, because among their possible interpretations there is at least one—and the most salient one, in fact—which entails quantity, and which is not available for the putative source forms with be-. Under the assumption that event structure is retained in verbal passive, it thus emerges that the passive forms in (103) are not derived from the attested active cases, but rather, it appears, from a variant of the active cases which does not have a preposition, and which allows a quantity reading. As such, these too become cases of a morphophonological gap, rather akin to the derivation of, say, aggressor and aggressive from a verbal source which, for whatever reason, may not be realized as an active independent verbal form (and note that the phonological properties of aggress or of transitive yara ‘shoot’, xabat ‘hit’, and tippel ‘treat, attend to’ could not be the problem here, as we do know what they are and they are phonologically well formed). Put differently, I suggest that yara ‘shoot’, xabat, ‘beat’, and tippel ‘treat, attend to’ belong with the alternating cases in (108)–(109), and with their passive forms in (103) corresponding to that active member of the paradigm which is, in turn, morpho-phonologically unrealizable. That there are three such verbs in Hebrew certainly lends support to an account based on an accidental gap, rather than a systematic semantic or syntactic operation.

A second look at the Short AS-nominals constructed from such verbs now reveals that alongside the P version in (104a–d), by assumption cases of impersonal passive, there does exist a direct argument version, albeit at times with some idiosyncratic

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28 The verb yara ‘shoot’, does have a direct object variant, providing the object is the projectile being shot (bullets, missiles, arrows, etc.). In turn, a projectile is not felicitous with a P-object:

(i) a. Ran yara b-a.qešet
    Ran shot in-the.bow

b. Ran yara b-a.ʔec
    Ran shot in-the.tree

c. *Ran yara b-a.xec
    Ran shot in-the.arrow

(ii) a. ??Ran yara et ha.qešet
    Ran shot in-the.bow

b. *Ran yara et ha.ʔec
    Ran shot in-the.tree

c. Ran yara et ha.xec
    Ran shot the.arrow
morpho-phonological twists. For *xabaṭa* ‘beating’, a Short AS-nominal with a direct argument is available straightforwardly as in (99). In turn, while the Short free AS-nominal corresponding to *tippul* in (104a) is not available with a direct argument, its **Construct** variant is licit (cf. 114). Finally, while a direct passive version for *yeriya*, on a par with (104c, d) is never available (cf. 115a–b), there exists, in actuality, an alternative morpho-phonological derived nominal for the very same verb, *yeri*, likewise ‘shooting’, which is a Short AS-nominal and which freely allows both the P-variant and the direct variant (cf. 116). In section 5.7 I return to the morphological difference between *yeri*-type AS-nominals and *yeriya*-type AS-nominals. For our discussion here, suffice it to say that *yeri* and its paradigm-mates, all of a Biblical Hebrew origin, are obligatorily Short AS-nominals, i.e. always passive, and are excluded both as Long AS-nominals and as R-Nominals. They further do not allow šel, with the result that construct formation is obligatory with a direct argument:

(113) a. *ha.xabaṭa*  šel *ha.keset*
   the.beating of the.comforter [Free nominal]

   b. *xabaṭat*  *ha.keset*
   beating the.comforter [Construct]

(114) a. *tippul*  šel *ha.maxala*
   the.treatment of the.disease [Free nominal]

   b. *tippul*  *ha.maxala*
   treatment the.disease [Construct]

(115) a. *ha.yeriya*  šel {*ha.mapginim/??ha.totax*}
   the.shooting of the.demonstrators/the.cannon [Free nominal]

   b. *yeriyat* {*ha.mapginim/??ha.totax*}
   shooting the.demonstrators/the cannon [Construct]

(116) a. *yeri*  *ha.mapginim/ha.totax* (*al yedey ha.caba*)
   shooting the.demonstrators/the cannon (by the.army)
   *kedey*  *la.?acor*  ‘et  *ha.mexa’a*
   in order to.stop  om of the.protest
   ‘the shooting of the demonstrators/the cannon (by the army) in order to
   stop the protest’

   b. *ha.yeri*  b-a.mapginim/b-a.totax (*al yedey ha.caba*)
   shooting in-the.demonstrators/in-the.cannon (by the.army)
   *kedey*  *la.?acor*  ‘et  *ha.mexa’a*
   in order to.stop  om the.protest
   ‘the shooting at the demonstrators/of the gun (by the army) in order to stop
   the protest’

   c. *ha.yeri*  šel *ha.mapginim/ha.totax* (*al yedey ha.caba*)
   the.shooting of the.demonstrators/the.gun (by the.army)

   d. *yeri*  *ha.caba*  ‘et/b-  *ha.mapginim/ha.totax*
   shooting the.army om/in- the.demonstrators/the.cannon
Finally, we note that yet again, it is within AS-nominals that the picture is systematic, while within the verbal paradigm some surprising gaps are attested, all of them, it would appear, of a morpho-phonological nature. Insofar as the model advanced here assumes the existence of an underspecified phonological index associated with a late full spellout, the existence of some morpho-phonological gaps in the local context of the (categorized) root is neither surprising nor troubling. In turn, and insofar as it is the AS-nominal paradigm that is regular, rather than that of clausal occurrences, it hardly supports a lexical listing view of their derivation, nor a rejection of the passive analysis as such.

5.5.4.4 Tough nominals Engelhardt (1998, 2002), analyzing the cases in (117) as involving passive (Tough-like) AS-nominals, points out that in these cases the preposition does disappear obligatorily. From this she concludes that while passive is possible in AS-nominals, the cases in which a preposition is retained, i.e. cases analyzed here as impersonal passive, cannot be thus derived:

\[(117) \text{ha.ba?aya qa?a le-?ippul} \quad (*b.a)\]
the.problem hard to-treatment (in.it)

The argument, however, suffers from one major flaw. Very importantly, Tough nominals never allow any complements, including in cases where such complements are orthogonal to passive or where within the clausal domain impersonal passive clearly is licit:

\[(118)\]

\[a. \text{ha.seper qal le-qri’a} \quad (*b.o)\]
the.book easy to-reading (in.it)

\[b. \text{*ha.nose qa?e le-ktiba ?al.av} \quad \text{[cf. licit (88b, 119e)]}\]
the.topic hard to-writing about.

c. \text{*ha.na?ara qa?a ?le-dibur b.a} \quad \text{[cf. licit (88c, 119f)]}
the.girl easy to-taking in.her

d. \text{ha.matanot qa?ot le-mi?loax (*l-a.yeladim)} \quad \text{[cf. licit (119a–b)]}
the.gifts hard to-sending (to-the.children)

e. \text{ha.meyda? qal le-mesira (*le-?itonaim)} \quad \text{[cf. licit (119c–d)]}
the.information easy to-transmission (to-journalists)

\[(119)\]

\[a. \text{ha.matanot ni?lexu l-a.yeladim} \quad \text{[cf. licit (119a–b)]}\]
the.presents sent.PASS to-the.children

\[b. \text{ha.mi?loax ?el ha.matanot l-a.yeladim} \quad \text{[cf. licit (119a–b)]}\]
the.sending of the.presents to-the.children

c. \text{ha.meyda? nimsar l-a.?itonaim} \quad \text{[cf. licit (119c–d)]}
the.information delivered.PASS to-the.journalists

d. \text{ha.mesira ?el ha.meyda? l-a.?itonaim} \quad \text{[cf. licit (119c–d)]}
the.delivering of the.information to-the.journalists

e. \text{niktab rabot ?al ha.nose.} \quad \text{[cf. licit (119c–d)]}
write.PASS much on the.topic

‘The topic was amply written about.’
In view of this, some additional restrictions clearly apply to the derivation of Tough nominals. Assuming, with Engelhardt, that Tough nominals do involve the promotion of an argument, it remains the case that as no constituent whatsoever can follow the nominal, the only possible input to such a passive is cases which involve, exclusively, a sole direct argument, a restriction clearly not motivated by the properties of passive within the clausal domain in Hebrew. As such, then, Tough AS-nominals, even if they do involve passive, cannot provide an argument concerning the existence, or lack thereof, of passive in non-Tough Short AS-nominals.

If yeri, as I shall argue in section 5.7, is a morpho-phonological instantiation only compatible with a passive derivation, its occurrence in Tough nominals supports Engelhardt’s claim that they involve, among other factors, an obligatory passivization. In turn, and insofar as yeri also appears in Short AS-nominals, both with and without a preposition, it strongly argues that if Tough nominals are passive, so must Short AS-nominals be, P-variety included. It thus emerges that whatever arguments Engelhardt summons to support her view of Tough nominals as passives actually bolster the case for Short AS-nominals as passive, rather than weaken it.

5.6 Raising Passive

5.6.1 Raising passive and quantity

One of the clear consequences of combining the architecture of AS-nominals with that of e is that there is no particular reason to block our Subject-of-Quantity from moving to the nominal domain, to be then of-marked as in (68) above (repeated here as (121)), or, in English, further to Spec,D, where it would be marked by the English genitive marker ’s, thereby occurring pre-nominally, as in (122). This movement is expected to be grammatical here exactly as it is, indeed, for regular Long AS-nominal cases, in the derivation in (63a):
The structure in (122) would, in turn, be that of the nominals in (123):

(123)  
   a. the station’s (deliberate) destruction (by the enemy) (in order to intimidate the rebels)  
   b. the ban’s (deliberate) enforcement (by the Coast Guard)  
   c. the loan’s (intentional) deferment (by my bank)  
   d. Mary’s (conspiratorial) dismissal (by her employee)

We already noted in Chapter 4, section 3.2 that Grimshaw’s attempt to analyze cases such as (123) as result nominals (our R-nominals) is rather detrimental to the overall attempt to put in place a successful typology distinguishing R-nominals from AS-nominals, given the overwhelming event-structure-like properties associated with such cases. But even within accounts which do classify the nominals in (123) as AS-nominals and which do subscribe to the view that AS-nominals do have an embedded event complex, approaches do exist which question the raising of the (understood) object over the nominal. Thus Alexiadou (2001) suggests, following ideas by Roberts (1987) and Doron and Rappaport-Hovav (1991), that the theme argument in so-called passive nominals (“raising passive” in the present terminology) does not raise, but merges directly in Spec,D. To accommodate the AS-nominal interpretation which emerges, Alexiadou (2001) proposes that raising passive nominals involve a DP-internal event structure with a stative $v$ (BECOME), denoting a kind of ingressive aspect which indicates an instantaneous change of state, i.e. achievement. In turn, regular AS-nominals involve the projection of a HAPPEN $v$.\footnote{Many of Alexiadou’s (2001) arguments in support of the claim that pre-nominal objects merge directly in Spec,D are based on rather weak judgments. As the analysis is altogether abandoned in Alexiadou (2009), a detailed review is not attempted.}

The assumption that pre-nominal objects are associated with achievement structures is, in turn, intended to capture the fact, otherwise argued for, that pre-nominal objects are only compatible with telic, quantity structures (in fact, not solely achievements, but accomplishments as well). That this is indeed the case was independently pointed out by Tenny (1987, 1994), Snyder (1998), and Egerland (1996), and can be illustrated by the contrast between (124) and (125):

(124)  
   a. the peasants’ dispossession {??for several decades/in several decades}  
   b. the ban’s enforcement {??for several weeks/in two hours}  
   c. the decision’s postponement (*for several weeks) [with the intended reading]
(125)  a. the dispossession of the peasants {for several decades/in several decades}
b. the enforcement of the ban {for several weeks/in two hours}
c. the postponement of the decision for several weeks [with the intended reading]

The restriction is frequently attributed to the “Affectedness Constraint” first formulated by M. Anderson (1979) to account for the ungrammaticality of (126a–c):

(126)  a. *French’s knowledge (by Kim)
b. *math’s understanding (by Pat)
c. *the flight’s fearing (by Robin)

The ungrammaticality of (126a–c) compares with the grammaticality of (127a–c), showing the source of the ungrammaticality in (126a–c) to clearly reside with the pre-nominal position:

(127)  a. knowledge of French (by Kim)
b. understanding of math (by Pat)
c. the fearing of the flight (by Robin)

The licit cases in (127a–c) are clearly not telic. However, it is worthwhile noting that contrary to what is commonly claimed, the Affectedness Constraint, so called, does not necessarily define a uniform set. The two established tests for (lack of) Affectedness in the literature involve pre-nominal objects, as in (126a–c), and middle formation (cf. Jaeggli 1986; Roberts 1987, i.a.). However, middle formation is possible with some non-quantity events, as in (128), and is excluded for some quantity events, notably events of consumption and creation, as illustrated by (129):

(128)  a. This car drives easily.
b. This rope pulls with difficulty.

(129)  a. *Schools build/construct easily.
b. *This concerto composes with difficulties.
c. *This ice cream consumes with difficulties.

A considerably better match with otherwise established tests of quantity is available in the pre-nominal domain, where pre-nominal objects of consumption and creation nominals are licit:

(130)  a. the school’s construction by the municipality in two years
b. the concerto’s composition by Mozart in a mere two weeks
c. the ice cream’s consumption in three minutes

In view of the discussion thus far, consider now the ungrammaticality of (131) when contrasted with the grammaticality of (132) on the one hand and of (133) on the other:
a. *children’s dispossession
b. *troops’ deployment
c. *workers’ dismissals
d. *quicksilver’s crystallization
e. *revenues’ diminishment

(132) a. the children’s dispossession
b. the troops’ deployment
c. [many workers’] dismissals
d. the quicksilver’s (unanticipated) crystallization
e. the revenues’ diminishment

(133) a. the dispossession of children (for many years/*in three years)
b. the deployment of troops (for two months/*in two months)
c. the dismissals of workers (for a decade/*in a week)
d. The (unanticipated) crystallization of quicksilver (for 2 seconds)
   (destroyed the process).
e. the diminishment of revenues (for months/*in such a short time)

Any thematic constraint that applies specifically to pre-nominal objects would be
rather hard to state, given this contrast, nor could it be maintained that bare plurals
or mass are independently barred in pre-nominal position. Rather, such pre-nominal
bare plurals and mass are licit, providing no event is implicated, as (134) shows. They
are further licit if understood as correlating with the external rather than the internal
argument, as (135) shows:

(134) a. Disabled children’s parents are going to protest this decision.
b. Oxen’s pictures were lying on the table.
c. Workers’ houses were demolished this morning.
d. Hunger and hormones determine food’s appeal.

(135) a. children’s destruction of valuable furniture
b. employers’ dismissal of minority workers
c. Workers’ unionization in response to pay cuts

Rather, it is clear that the pre-nominal DP must be a quantity DP precisely when it
is a logical object, and precisely in contexts in which a quantity reading is obligatory.
These properties, in turn, are not properties typically associated with Spec,D. Rather,
they spell out the very profile of the node we have been referring to as ASP_Q, a node
which is implicated in quantity reading and which is licensed (most typically) by a
quantity DP. An explanation, then, is hardly likely to emerge from investigating the
properties of Spec,D as such. Rather, an explanatory system would involve the raising
to the pre-nominal position from within the domain of the event the very quantity
object that was implicated in the assignment of range to ASP_Q. It is thus precisely
because bare plurals and mass cannot license quantity interpretation that they cannot
be found in the pre-nominal position of Short AS-nominals.
In the next section I turn to accounting for the obligatoriness of quantity interpretation in the presence of a pre-nominal object, and more specifically to an explanation as to why only objects which assign range to ASP_Q may raise to that position. I note before proceeding that regardless of the specifics of the execution, the fact that pre-nominal objects in Short AS-nominals must be (nominal) quantity, when combined with the obligatory event quantity interpretation of these very AS-nominals, strongly argues for the (external) merge of the object in Spec,ASP_Q, as in (122), and for its subsequent raising to Spec,D. Ipso facto, then, it also argues against the direct merger of the logical object in Spec,D.

5.6.2 Raising to Spec,D and non-quantity

I suggested directly above that an explanatory account would have the pre-nominal (understood) objects in AS-nominals raised from within the event domain, where they licensed quantity event structure. This conclusion, while empirically warranted, nonetheless leaves us in need of explanation. Yes, pre-nominal objects in AS-nominals always correlate with quantity structures. But why?

Note now that pre-nominal objects are only available in Short AS-nominals. In Long derivations, they are altogether barred for locality reasons, and the only pre-nominal argument allowed is the external, “subject”. If Short AS-nominals are cases of passive, then it follows that all cases of pre-nominal objects in AS-nominals are cases of passive, with the addition of raising; and hence quite literally “raising passive”. The conclusion in section 5.6.1., once restated in these terms, thus amounts to saying that non-quantity passive AS-nominals, to the extent that they occur, do not allow their sole realized argument to move to Spec,D. For the sake of completeness, we note that cases of impersonal passives, as discussed in section 5.5.3., are irrelevant under the straightforward assumption that PPs may not move to Spec,D, and that the prepositions in such cases cannot be stranded (cf. fn. 23). Under consideration, then, are the cases of non-quantity “personal” passives in AS-nominals, analyzed in section 5.2.

But once the structure of such AS-nominals is reconsidered, as in (79) (repeated here as (136)), the answer to this question becomes directly clear:

\[
(136) \quad [D \rightarrow_{EQual} V-C_N[v] \rightarrow_{EXS-N} N^{offsel} \rightarrow_{V-C_N[v]} \rightarrow_{EQual} E \rightarrow_{P-VC} \rightarrow_{ofsel} \rightarrow_{DP1} V \rightarrow_{DP2} V \rightarrow_{Ic=v} V... \rightarrow_{Participant Ori-tor}
\]

Recall that movement to Spec,D perforce entails movement to Spec,E. Recall further that an element moving to Spec,E will receive an Originator role unless otherwise assigned a role. It therefore follows that the only elements that can move to Spec,D, through Spec,E, are either elements already assigned role elsewhere, or alternatively, elements that may receive an Originator role without resulting in the presence of two non-identified Originators. Subjects-of-Quantity, otherwise assigned a role in Spec,ASP_Q can thus move through Spec,E to Spec,D with impunity, giving rise to the pre-nominal object cases together with the quantity reading already noted directly
above (cf. 122). Finally, a DP which is otherwise not assigned a role could thus move, thereby acquiring an Originator role and resulting in a licit derivation, providing no additional Originator is present in the structure assigned specifically at Spec,e. What is impossible, however, is the movement of a DP which is otherwise not assigned a role locally, and precisely in cases which involve the presence of another Originator. In Borer (2005b) I argued extensively that non-quantity is but the absence of quantity, and is not associated with a dedicated structure. As a result, direct objects in non-quantity structures are never semantically licensed in their local external merge site. Rather, as already noted, they merge as the specifiers of an otherwise semantically inert node, FSHL, whose sole function is to assign objective, partitive case to them. Their interpretation, in turn, is computed based on the event as a whole (see Chapter 2, section 3 for a brief review). If such arguments (re-)merge with E, however, they would be assigned an Originator role in that position. If another Originator is already present in the derivation, in Spec,e, the derivation would crash. It therefore follows that if movement to Spec,D entails merger at Spec,E en route, such “participant” arguments may never move to Spec,D. That AS-nominals with pre-nominal objects may only be quantity and may only emerge from quantity event structure now follows in full.

The excluded non-quantity aspectual modification in (124) is now likewise explained. For it to be licit, the event would need to be a non-quantity one, and thus the object would have to have emerged in the absence of quantity structure. But in such a structure it would be assigned an Originator role in Spec,E, on its way to Spec,D, and the derivation would crash, as the structure already has a (distinct) implicit Originator otherwise indexed. The contrasts between (131) on the one hand and (132)–(133) on the other hand follow as well. As bare plurals or mass nominals cannot license quantity structures, the prenominal object could only have originated (grammatically) in a non-quantity structure, and with no local role assigned to it. It, too, would be landing an Originator role en route to Spec,D, resulting in the crashing of the derivation. Not so (132), in which the pre-nominal object is quantity, or (133), in which the object is assigned case through Agree, and thus need not move to Spec,E altogether.

Finally, consider AS-ING nominals. While Short AS-ING nominals are possible, both with quantity and non-quantity objects (cf. 137), and with all other diagnostics of passive already discussed, pre-nominal objects are barred across the board and regardless of their quantity specification (cf. 138–139), an effect that has led at least some scholars to postulate a radically different structure to AS-ING nominals and AS-ATK nominals (adjectives provided to avoid a gerundive construal):30

(137)  a. the dispossessing of (the) children (by the state) (in order to fill its coffers)
b. the deploying of (hundreds of) troops (by Greece) (in order to discourage protest)

30 See Chapter 2, section 5 as well as Chapter 4, section 3 for a review.
c. dismissing of (the) workers (by the management)
d. the crystallizing of (the) quicksilver (by the chemist) (in order to control for impurities)
e. the diminishing of (the) support (by the government)

(138) a. *children’s (cruel) dispossessing (in/for several decades)
b. *troops’ (rapid) deploying (in/for several months)
c. *workers’ (sudden) dismissing (in/for several months)
d. *quicksilver’s (unanticipated) crystallizing (in/for several months)
e. *support’s (sad) diminishing (in/for several months)

(139) a. *the children’s (cruel) dispossessing (in/for several months)
b. *the troops’ (rapid) deploying (in/for several months)
c. *many workers’ (sudden) dismissing (in/for several months)
d. *the quicksilver’s (unanticipated) crystallizing (in/for several months)
e. *the support’s (sad) diminishing (in/for several months)

Much of Chapter 4 was devoted to substantiating the claim that ING in [V] is semantically incompatible with quantity structure and that it entails an Originator. That AS-ING nominals specifically, are incompatible with quantity interpretation was likewise massively substantiated. If, however, quantity structure is never licit in the scope of ING in [V], it follows that any object in the scope of ING in [V] cannot be a Subject-of-Quantity, and if direct, may only be a default event Participant. In Long AS-nominals, such an object would merge with FShL, as per the derivation in (140) (and see Chapter 4, section 1, structure (9a) as well as section 8 of Chapter 4, example (134)):

\[(140) \quad [D \quad DP_1's_{[\text{ExS-N}_2 \text{CN}[V]} \quad [\text{ExS-N}_1 \text{DP}_1 \quad [C_{\text{CN}[V]} \quad [E_{\text{DP}_1} \quad \exists_{/H11270} \quad e_{/H11271} \quad E \quad [\text{FSHL of DP}_2 \quad [C_{\text{SV}} \quad \text{IGINN}_1] \quad \text{ATK \quad Originator \quad Participant}]\quad \text{INGN}_1]\quad \text{IGINN}_1] \quad \text{IGINN}_1] \quad \text{IGINN}_1] \quad \text{IGINN}_1] \quad \text{IGINN}_1] \quad \text{IGINN}_1] \quad \text{IGINN}_1] \quad \text{IGINN}_1] \quad \text{IGINN}_1] \quad \text{IGINN}_1]]\]

In Short AS-nominals, however, the object would follow the path delineated by DP1 in (136). ASP_Q is by assumption absent here. In turn, Short AS-nominals are incompatible with objective case, thereby disallowing FShL. As a result, DP1 may only merge with P-Vc (passive voice), where it would proceed to receive case through Agree, giving rise to a licit derivation. However, an attempt to raise such an object would perforce pass through Spec,E, where it would obligatorily be matched with an Originator role. The derivation would thereby crash, having two Originators. Rather than attribute, then, the ungrammaticality of (138–139) to the universal impossibility of object raising to Spec,D, it should be attributed to the aspectual properties of ING in [V], for which there is ample independent evidence. Crucially, note, there is nothing “special” about ING in [V] nominals which is not otherwise attested in ATK nominals. Rather, insofar as ATK nominals may scope over either a quantity or a non-quantity event, and insofar as ING in [V] nominals may only scope over a non-quantity event, the behavior of ING in [V] nominals is, as predicted, a subset of the behavior of ATK nominals.
By way of completing the paradigm, consider the cases of pre-nominal arguments in (141) and (142):

(141) a. *the train’s final arriving [and compare with the train’s arrival]
b. *the rabbit’s complete disappearing [and compare with the rabbit’s disappearance]
c. *the volcano’s violent erupting [and compare with the volcano’s eruption]

(142) Intransitive construal:
   a. the ship’s (rapid) sinking
   b. the asteroid’s (unnoticed) dropping
   c. the planet’s (slow) moving
   d. the candidate’s (unsightly) twisting and turning

The post-nominal correlates of these cases, under an intransitive derivation, were already discussed in section 4.1 of Chapter 4 and are repeated here:

(143) a. *the arriving of the train [and compare with the arrival of the train]
b. *the disappearing of the rabbit [and compare with the disappearance of the rabbit]
c. *the erupting of the volcano [and compare with the eruption of the volcano]

(144) Intransitive construal:
   a. the sinking of the ship (for several hours/*in several hours)
   b. the falling of the asteroid through the atmosphere (for several seconds/*in several seconds)
   c. the moving of the planet (for millions of years/*in a decade)
   d. the twisting and turning of the candidates (for long minutes/*in five minutes)

We note that insofar as the cases in (141) are ungrammatical in a fashion directly parallel to the ungrammaticality of the cases in (143), this is exactly what is expected, given the inherent quantity structure of achievement predicates and hence their incompatibility with ING$_{N[V]}$. In turn, such parallelism is not necessarily expected if pre-nominal subjects merge externally in their surface position. Considering now the cases in (142), we note that here, raising to the pre-nominal position is possible in the presence of ING$_{N[V]}$. However, and as already noted for the correlate cases in (144), these are cases of monadic variable verbs, so called—cases which easily lend themselves to both quantity and non-quantity construals. In the contexts of ING$_{N[V]}$, the only possible construal is that of unergatives—Originators in the context of atelic, non-quantity predicates. Yet again, the parallelism between the pre- and post-nominal occurrences would be mysterious if such structures are fundamentally distinct.

5.7 Dedicated Passive Nominals, Hebrew

Precisely because the analysis of passive adopted here severs participial marking from the passive, it makes no predictions whatsoever on the existence, or lack thereof,
of morphological marking for passive AS-nominals. That no such marking is, indeed, present in English or German or Romance is thus not problematic in any sense. On the other hand, the analysis of passive put forth here does not bar such specialized marking. Insofar as the structure of Short and Long AS-nominals is assumed to be different, the existence of a morphological marking to that effect is certainly possible.

Hebrew, as it turns out, does mark this syntactic difference, in a narrow, but relatively well-defined domain. Within that domain, we find that two possible morphological instantiations of AS-nominals for the same verb exist side by side. While one of them typically has the full range of AS-nominals, both Long and Short, the other is restricted to Short AS-nominals with passive properties.31

The existence of a second type of derived nominal in Modern Hebrew is noted, in the generative literature, by Doron and Rappaport-Hovav (1991). Unfailingly, these second variants are associated with verbs otherwise occurring in the first template (binyan I, Qal) and represent, historically, an older, presumed Biblical layer in synchronic Hebrew morphology (henceforth BH for Biblical Hebrew). On the other hand, the more productive nominal form used for Qal represents a layer of Rabbinical Hebrew in synchronic Hebrew morphology (henceforth RH for Rabbinical Hebrew), with the latter being, grammatically, a relatively close antecedent of Modern Hebrew. Importantly, for all cases under consideration here, one verb may be associated with two distinct derived nominals, one with BH characteristics and the other with RH characteristics. Some illustrative pairs are in (145):32

(145) Root Verb BH-type forms RH-type forms
a. "\HRS haras heres harisa 'destruction' 
   "\RCX racax recax recixa 'murder'
   "\QTL qatal getel qtila 'killing'
   "\HRG harag hereg hariga 'killing'
   "\XQR xaqar xequer xaqira 'investigation'
   "\YRH yara yeri (yeriya) 'shooting'

31 Some exceptions to this morphological generalization are attested, and specifically, recall that yeriya 'shooting', was possible as Long and as Short, but the latter only with a P-variant. See fn. 35 for an important point on the nature of the morphological variation under discussion here and the exceptions attested within it.

32 The reader should bear in mind that all judgments and argumentation are based on Modern Hebrew, and that the identification of forms as BH or RH is intended to isolate two distinct but co-existent morphological sub-strata active in Modern Hebrew, which happen to be related to different historical periods in the development of the language. As such their properties may, but need not, be identical to the grammatical constraints that may have been associated with them at the historical point at which they emerged.

33 The actual template for the RH forms is \[r_1r_2r_3A\] and with \(r_1r_2r_3\) root radicals and capitalized letters standing for tematic information. The cluster \(r_1r_2\) is broken with a schwa where not phonologically licit, and with [a] when \(r_1\) is a pharyngeal consonant. As I shall argue in Chapter 11, Qal is not a true binyan, i.e. verbs thus inflected are not headed by functors but rather represent V-equivalent roots in the context of dominating ExP-segments. The result is a paradigm riddled with root-specific phonological information. Nonetheless, it is important to bear in mind that what might be unpredictable is the set of possible phonological realizations in a given syntactic context. The syntax, however, is entirely regular and cannot possibly be attributable to any listedness effects.
Before proceeding to characterize the grammatical properties of these distinct nominals, an important theoretical clarification is in order. In some templates, or binyanim, Hebrew, as already noted in section 5.4 (cf. (62) and related discussion), marks passive directly on the verb through the existence of a particular vocalic melody. However, there are no specialized nominal forms that go with these particular melodies, and they do not constitute an independent paradigm, lacking, as they do, an infinitive and a separate derived nominal. Rather, there is a unique, single derived nominal for each of these binyanim occurring in both Short and Long variants. For Qal, the specific paradigm under consideration here, things are somewhat different, insofar as it does not have its own internal passive, and its passive in the verbal domain, where available, consists of an exaptation of another binyan, Binyan II, as the following pairs illustrate, and where the availability of a passive construal is marked by a licit by-phrase:

<table>
<thead>
<tr>
<th>Qal</th>
<th>Binyan II</th>
</tr>
</thead>
<tbody>
<tr>
<td>racax ‘murder’</td>
<td>nircax (al yedey) ‘was murdered by’</td>
</tr>
<tr>
<td>katab ‘write’</td>
<td>niktab (al yedey) ‘was written by’</td>
</tr>
<tr>
<td>‘edit’</td>
<td>ne’erak (al yedey) ‘was edited by’</td>
</tr>
</tbody>
</table>

Binyan II, however, has an independent existence from that of Qal. It has its own full paradigm complete with a (regular) derived nominal, and most importantly, while the forms in (146) do a reasonable job as passives of Qal, the majority of binyan II forms are in actuality inchoatives which need not have a Qal correlate and which even when they do, do not function as its passive (and see Alexiadou and Doron 2012 for a detailed discussion):

<table>
<thead>
<tr>
<th>Qal</th>
<th>Binyan II</th>
</tr>
</thead>
<tbody>
<tr>
<td>nidlaq (*al yedey)</td>
<td>nirtab (*al yedey)</td>
</tr>
<tr>
<td>‘become lit (by)’</td>
<td>‘become wet (by)’</td>
</tr>
<tr>
<td>nipsaq (*al yedey)</td>
<td>stop.intrans. (by)</td>
</tr>
<tr>
<td>‘stop. (by)’</td>
<td></td>
</tr>
<tr>
<td>nišbar (*al yedey)</td>
<td>nigrar (*al yedey)</td>
</tr>
<tr>
<td>‘break.intrans. (by)’</td>
<td>‘end.intrans. (by)’</td>
</tr>
</tbody>
</table>

Derived nominals in binyan II, and quite apart from their specific interpretation, are altogether very awkward to present-day speakers. To the extent that such awkwardness can be set aside, however, the derived nominals in binyan II corresponding to the cases in (146) can and indeed must occur as passive AS-nominals,

---

34 In this particular case, the meaning of the BH form is more specific than that of either verb or RH nominal, in referring specifically to the picking of tree-growing fruit.
with exactly the characteristics expected, i.e. a Short AS-nominal, a by-phrase, an implicit argument control, and so on. As such, they certainly lend direct and conclusive evidence for the possibility of passive within AS-nominals:

\[ (148) \]

(a) \( ?\text{ha.heracat} \) the.murdering.PASS \( \text{šel} \) Rabin \( (?\text{al yedey Yig’al ?amir}) \)

(b) \( ?\text{ha.hikatbut} \) the.writing.PASS \( \text{šel} \) ha.ma’amar \( (?\text{al yedey Neta}) \)

(c) \( ?\text{ha.he?arkut} \) the.editing.PASS \( \text{šel} \) ha.ma’amar \( (?\text{al yedey ha.student}) \)

Importantly, and especially in the context of the awkwardness of the nominals in (148), the nominals actually under consideration here, and which pattern syntactically exactly with those in (148), are not morphologically earmarked as either passive or active. The RH variant, rather, is simply the most predictable derived nominal correlating with Qal verbs across the board. The BH variant, in turn, belongs to a large class of nouns which are typically not derived from a verbal source, and that likewise seem to have been exapted by some instances of Qal to realize a particular configuration. These are all matters that I return to in some detail in Chapter 11, where they will turn out to be pivotal in distinguishing the behavior of roots and the behavior of functors.

Turning to the distinct syntactic characterization of the two forms, and from the perspective presented here, the most important distinction between the BH forms and the RH forms consists of the fact that while RH nominals are, in principle, possible as both Long and Short AS-nominals, BH nominals are only possible as Short AS-nominals, as illustrated in (149)–(156) by the two minimal pairs heres/\( \text{harisa} \) ‘destruction (transitive)’ and qaṭip/\( \text{qṭip} \) ‘picking’. Note that BH forms may only occur as Construct nominals, while RH forms may occur both as Free nominals and as Constructs:

\[ (149) \]

(RH, Free nominal, Long)

a. \( \text{ha.harisa} \) the.destruction of the.enemy \( \text{šel} \) ha.'oyeb \( 'et \) ha.?ir \( \text{om} \) the.city

b. \( \text{ha.qṭip} \) the.picking of the.boys \( \text{šel} \) ha.yeladim \( 'et \) ha.tapuxim \( \text{om} \) the.apples

\[ (i) \]

(i) is by way of confirming that the awkwardness effect is not specific to passives:

(a) \( ?\text{ha.higamrut} \) the.end.II of the.cand \( \text{šel} \) ha.sukaryot \( (*?\text{al yedey Xagai}) \)

(b) \( ?\text{ha.hikabut} \) the.extinguish.II of the.light \( \text{šel} \) ha.or \( (*?\text{al yedey Neta}) \)

(c) \( ?\text{ha.heratbut} \) the.wet.II of the.article \( \text{šel} \) ha.ma’amar \( (*?\text{al yedey ha.student}) \)
(150) RH, Free nominal, Short
a. ha.harisa šel ha.?ir (qa?al yedey ha.'oyeb)
   the.destruction of the.city (by the.enemy)
b. ha.qtipa šel ha.tapuxim (qa?al yedey ha.yeladim)
   the.picking of the.apples (by the.boys)

(151) RH, Construct nominal, Long
a. harisat ha.'oyeb 'et ha.?ir
   destruction the.enemy om the.city
b. qtipat ha.yeladim 'et ha.tapuxim
   picking the.boys om the.apples

(152) RH, Construct nominal, Short
a. harisat ha.?ir (qa?al yedey ha.'oyeb)
   destruction the.city (by the.enemy)
b. qtipat ha.tapuxim (qa?al yedey ha.yeladim)
   picking the.apples (by the.boys)

(153) *BH, Free nominal, Long
a. *ha.heris šel ha.'oyeb 'et ha.?ir
   the.destruction of the.enemy om the.city
b. *ha.qtip šel ha.yeladim 'et ha.tapuxim
   the.picking of the.boys om the.apples

(154) *BH, Free nominal, Short
a. *ha.heris šel ha.?ir (qa?al yedey ha.'oyeb)
   the.destruction of the.city (by the.enemy)
b. *ha.qtip šel ha.tapuxim (qa?al yedey ha.yeladim)
   the.picking of the.apples (by the.boys)

(155) *BH, Construct nominal, Long
a. *heris ha.'oyeb 'et ha.?ir
   destruction the.enemy om the.city
b. *qtip ha.yeladim 'et ha.tapuxim
   picking the.boys om the.apples

(156) BH, Construct nominal, Short
a. heris ha.?ir (qa?al yedey ha.'oyeb)
   destruction the.city (by the.enemy)
b. qtip ha.tapuxim (qa?al yedey ha.yeladim)
   picking the.apples (by the.boys)
That the distribution of BH forms patterns exactly with that of Short AS-nominals can be further illustrated by the ungrammaticality of (157), where 'et co-occurs with the absence of a subject (cf. (21) in section 5.2 and related discussion) as well as by the availability of implicit argument control in (158). We note that modification by adverbs is possible, ruling out the possibility that BH forms with arguments are an exotic variant of an R nominal. Furthermore, and as noted by Doron and Rappaport-Hovav (1991), arguments are obligatory BH nominals, and bare forms, while possible for RH nominals, are excluded as BH nominals (159):

(157) a. *ha.heres 'et ha.?ir (ʔal yedey ha.’oyeb)
   destruction om the.city (by.the.enemy)
   b. *ha.qaṭîp 'et ha.tapuxim (ʔal yedey ha.yeladîm)
      picking om the.apples (by.the.boys)

(158) a. heres ha.kalkala le’at le’at (ʔal yedey ha.šîltonot)
   destruction the.economy gradually (by.the.authorities)
   kedey le-massed 'et ha.kibbuš
   in order to-institutionalize om the.occupation
   b. qaṭîp ha.tapuxim be-yeʔilut (ʔal yedey ha.mitnadbîm)
      picking the.apples competently (by.the.volunteers)
      kedey la-ʔazor l-a.ikar
      in order to help to-the.farmer

(159) a. *ha.heres/*ha.qeṭel/*ha.xeqer duvax b-a.ʔitonim
      the.destruction/the.killing/the.investigation report.pass in-the.press
      b. ha.harisa/ha.qṭila/ha.xaqira duvixa b-a.ʔitonim
         the.destruction/the.killing/the.investigation report.pass in-the.press

Doron and Rappaport-Hovav, relying on Goldenberg (1994), mention that in Biblical Hebrew, these forms, the sole instantiations of derived nominals, existed with neither ‘et, otherwise available in Biblical Hebrew, nor šel insertion, otherwise not available in Biblical Hebrew, both diagnostics which they have kept. Šel as a genitive marker for referential DP is a development which is associated with the influence of Aramaic, where a genitive preposition, de, exists. I already suggested that it šel available in nominal specifiers, on a par with of. Construct genitive, on the other hand, appears to require the formation of a prosodic unit between the head and the complement, thus allowing genitive marking for the non-head, overtly marked in Classical Arabic. Given the absence of šel for BH forms, even in their Modern Hebrew use, the natural assumption would be that the choice of realization is sensitive to the specific array of nominal ExP-segments, and that the BH spellout is barred in the presence of whatever ExP-segments are linked to šel-marking. Construct formation thus remains as the only means for assigning (genitive) case to the non-head.

More puzzling is the unavailability of ‘et in BH nominals precisely because ‘et is available in Biblical Hebrew, and its absence in BH nominals cannot be thus accounted for. The question, then, is why ‘et may not co-occur with BH nominals, in Modern Hebrew, or for that matter, in Biblical Hebrew.

Recall now that I suggested that the existence of ‘et in Hebrew derived nominals, vs. the absence of accusative case marking in e.g. English nominals, stems from the
fact that ‘et-marking is independent of T and g-asp, while English accusative case is contingent on either. Suppose we now go on to assume that severing ‘et from the need for T-licensing is a development associated, specifically, with Rabbinical Hebrew. If that is, indeed, the case, it emerges that in Biblical Hebrew, on a par with e.g. German (or for that matter Romance or Polish), only one argument could be realized within AS-nominals. German, as we saw (see Chapter 4, section 1.2) resolved the conundrum by forcing the realization of quantity arguments (presumably under a passive derivation) but allowing either argument to be realized in non-quantity structures. Biblical Hebrew, on the other hand, resolved the conundrum by forcing a passive derivation for all AS-nominals. It is this specific context for its spellout, then, that it carries on to Modern Hebrew, where AS-nominals need not be passive across the board, and where a reanalyzed ‘et is licit. The specific derivations for the BH forms, in Modern Hebrew as well as presumably in Biblical Hebrew, are thus as in (160) (quantity structure) and (161) (non-quantity) (irrelevant structural details omitted):36,37

\[(160)\]

\[
\begin{align*}
D &\rightarrow ExS-N1 \\
&\rightarrow DP1 \\
&\rightarrow ExS-N1 \\
&\rightarrow C_{n[v]} \\
&\rightarrow E \\
&\rightarrow DP1 \\
&\rightarrow E \\
&\rightarrow P-Vc \\
&\rightarrow DP2 \\
&\rightarrow DP1 \\
&\rightarrow ASP_{t} \\
&\rightarrow DP1 \\
&\rightarrow C=V \\
&\rightarrow \pi\sqrt{QCR}
\end{align*}
\]

36 We note as an aside that although BH nominals do not allow objective case, and as such appear to pattern with English, adverbs are nonetheless completely licit, showing that a unified explanation for the two phenomena, as based on the absence of both in English, is not the correct route to follow.

37 The structures in (160–161) presuppose that adjacency is sufficient for the formation of the Construct prosodic unit. While this can certainly be the case for referential non-heads, Construct formation with non-referential non-heads is more severely constrained. See Borer (2013) for some discussion.
Thus insofar as BH nominalizations in Modern Hebrew have come to mark a very specific variety of AS-nominals—that which is associated with Short AS-nominals, and with their passive properties—this morphological specialization represents direct evidence from within the realm of morphology for the structural distinction between Short and Long AS-nominals, a structural distinction which, I submit, directly reflects the presence of passive structure embedded in the former, but not in the latter.\(^{38}\)

\(^{38}\) As Doron and Rappaport-Hovav (1991) observe, the relevant BH forms do not pluralize, and note that this generalization applies to the forms in (145a) as well as to the forms in (145b):

<table>
<thead>
<tr>
<th>(i)</th>
<th>BH forms</th>
<th>RH forms</th>
</tr>
</thead>
<tbody>
<tr>
<td>a.</td>
<td>heres *harasim 'destruction(*s)'</td>
<td>harisa harisot 'destruction(s)'</td>
</tr>
<tr>
<td>b.</td>
<td>recax *recaxim 'murder(*s)'</td>
<td>recixa recixot 'murder(s)'</td>
</tr>
<tr>
<td>c.</td>
<td>hereg *haragim 'killing(*s)'</td>
<td>hariga harigot 'killing(s)'</td>
</tr>
<tr>
<td>d.</td>
<td>qetel *qṭalim 'killing(*s)'</td>
<td>qṭila qṭilot 'killing(s)'</td>
</tr>
<tr>
<td>e.</td>
<td>qaṭip *qṭipim '(fruit) picking(*s)'</td>
<td>qṭipa qṭipot 'picking(s)'</td>
</tr>
<tr>
<td>f.</td>
<td>bacir *bcirim 'grape harvest(*s)'</td>
<td>bcira bcirot 'grape harvest(s)'</td>
</tr>
<tr>
<td>g.</td>
<td>*asip *asipim 'late harvest(*s)'</td>
<td>*asipa *asipot 'collection(s)'</td>
</tr>
<tr>
<td>h.</td>
<td>qacir *qcirim 'grain harvest(*s)'</td>
<td>qcira qcirot 'grain harvest(s)'</td>
</tr>
<tr>
<td>i.</td>
<td>xariš *xarišim 'plowing(*s)'</td>
<td>xariša xarišot 'plowing(s)'</td>
</tr>
</tbody>
</table>

The observation is intriguing, insofar as it corresponds to Grimshaw’s (1990) original claim that AS-nominals cannot pluralize. It is somewhat puzzling, however, from the perspective I outlined in
5.8 Concluding Comments

In section 5.1, after establishing the prima facie advantages of a passive analysis over postulating a PRO subject in Short (articled) AS-nominals, I also noted a number of questions that such a passive analysis must address. These central issues are listed in (162):

(162) a. Where has the morphology gone?
b. Some, but not all Short AS-nominals may have a pre-nominal DP. What is the source of that difference between those that do and those that don’t?
c. Short AS-ING nominals never allow a pre-nominal DP. Why should that be?
d. Short AS-nominals are possible with PP complements, but not so clausal passive. Why should that be?

To the reader who has endured to this point, it should be evident that most of these questions have been answered, and that independent evidence for a passive analysis of AS-nominals is in fact rather compelling. The analysis of passive adopted here, we note, did not make passive structure contingent on passive morphology, insofar as I explicitly assumed that “passive” participial morphology is never an argument, nor is passive voice contingent on its existence. As a result, it was possible to combine under one analysis the structure of periphrastic passive with the structure of synthetic passive (as in Hebrew), as well as give a direct account for passive cases which emerge without any morphological marking altogether, as in Romance causatives or in Short AS-nominals. Such an analysis benefited from a comparison with de-adjectival nominals, where (definite) Short nominals are excluded, and from the discussion

Chapter 4, section 4.1, according to which the actual restriction is against the occurrence of count nouns as non-quantity AS-nominals, given the fact that the BH instantiations certainly can correspond to quantity structures.

Upon a closer look, however, what emerges is that although plural may be excluded, singular is not, making the forms in (i) count, although not plural. Specifically, and seeking a test that would be licit in conjunction with AS-nominals and with Construct nominals, we note that ordinals are incompatible with mass construal, as (ii) illustrates (cases in (iii) are Constructs):

(ii) a. #ha.xol ha.rišon; #ha.xacac ha.šeṇi; #ha.nešeq ha.šiliši
   the.sand the.first the.pebble the.second the.weaponry the.third
   ‘the first sand; the second pebble; the third weaponry’
b. # xol ha.xaccer ha.rišon; #xacac ha.qirot ha.šeṇi; #nešeq ha.yexida ha.šiliši
   sand.m the.yard.f the.first.m pebble the.walls the.second weaponry.m the.unit.f the.third.m
   ‘the first sea sand; the second wall pebble; the third weaponry of the unit’

They are, however, fully licit with the BH AS-nominals:

(iii) a. heres ha.ʔarti ha.rišon ?al yeley ha.caba
   destruction.m the.city.f the.first.m by the.army
b. xariš ha.sadot ha.šeṇi ?al yeley ha.ikar
   plowing.sg the.fields.pl the.second.sg by the.farmer
c. yerī ha.mapginim ha.šiliši ?al yeley ha.xayalim
   shooting.sg the.demonstrators the.third.sg by the.soldiers
of scopal effects which directly suggested that the argument of Short AS-nominals is higher than objects of transitive Long AS-nominals.

The account, in turn, did not exclude the possibility that passive structure could be morphologically marked within AS-nominals, insofar as Voice-P may, in some cases, set up a context which may give rise to a distinct phonological realization from that available in its absence. That such a dedicated realization is possible was in turn shown directly by considering the specialized function of parallel nominal realizations in Hebrew, where a unique realization has come to be associated, for some roots, with the exclusive properties of Short AS-nominals.

A single answer was provided for the puzzles in (162b, c). Pre-nominal DPs in Short AS-nominals may only correspond to Subjects-of-Quantity, and to a quantity event. The reason, I suggested, was that in the absence of a dedicated non-quantity structure, objects in such constructions are not locally assigned a role. Any movement of such a DP-object to Spec,D would perforce deposit it in Spec,E, en route, where it would receive an Originator role. While such a role, in and of itself, would not lead to ungrammaticality, it would be incompatible with any derivation in which there exists yet another argument with such a role. As by assumption an external argument is part of any passive derivation, albeit as a covert pro, such a derivation could never give rise to a licit “passive” AS-nominal. The account, as I showed, was not specific to Short AS-ING nominals, but rather covered all cases of non-quantity Short nominals, regardless of the nature of the nominalizer. Insofar as AS-ING nominals are always non-quantity, and insofar as other derived nominals may be either quantity or non-quantity, there is little reason to postulate, for AS-ING nominals, a distinct structure from that of other derived nominals. There is a structural difference, to be sure, between quantity events and non-quantity events, and AS-ING nominals may only be associated with the latter, but that very same structure is identically available for AS-ATK nominals as well, and exactly in such cases, pre-nominal objects in Short AS-nominals are similarly barred.

Finally, the answer to (162d) remained somewhat incomplete. I argued that the presence of PPs in Short AS-nominals corresponds to impersonal passive, and pointed out that rather systematically, to the extent that the clausal paradigm and the AS-nominal paradigm part ways, the exceptional behavior is typically associated with the clausal paradigm and not with the nominal paradigm, insofar as impersonal passives within the clausal domain seem to be limited in ways which do not apply within AS-nominals. Listedness, then, to the extent that it is necessary, would be that which would exclude impersonal passive in the verbal domain in some cases, but not in others, in both English and Hebrew. Pending, however, a better understanding of what might block impersonal passives in clausal cases, a full answer to the asymmetry between clausal impersonal passive and impersonal passive in Short AS-nominals must await future research.
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Part II

True to Form
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The Skeleton

6.1 Preliminaries: Bare Phrase Structure

6.1.1 Projections and categories

Within X’-theory as well as within its predecessors, the properties of the phrase marker were independent of those of terminals. While presumably the properties of, e.g., N’ were linked to those of N^0, insofar as N^0 could not be directly dominated by, e.g., V’, such linking did not extend to lexical terminals. Thus the fact that, e.g., classification or cat could be inserted under N but not so classify was, in effect, an independent matching constraint. By assumption, cat was listed as N. In turn, classification was an N as a result of an independent word formation operation that created it and thus labeled it. Likewise, classify was independently labeled as V by the word formation operation that created it. The categorial labels on such “words” to be inserted as terminals into the syntactic tree were not directly related to the categorial node labels manipulated by phrase structural operations. Rather, the insertion of, e.g., classification, under V was (implicitly) assumed to give rise to a mismatch and hence to ungrammaticality.1 Matching systems, as is often noted, are fundamentally redundant, and the case under consideration here is a typical one. The fully explicit system would require a categorial marking for hierarchical structures (mechanism 1); an independently generated categorial marking for terminals (listed or morpho-derived) (mechanism 2); and a formal mechanism capable of comparing the two (mechanism 3).

With Bare Phrase Structure (BPS), Chomsky (1995a) proposed to eliminate this redundancy by doing away with inherent labeling for phrasal structures together with a substantial chunk of the architectural constraints on their well-formedness. What are retained are listed category labels for lexical entries.2 N^0 no longer exists as a

1 Under discussion here is the manner in which X’-theory was largely utilized in the 1980s and 90s, in conjunction with the existence of an independent (semi-)generative component of word formation which is ordered prior to syntactic insertion, a system I reviewed broadly in Chapter 1. See also Chapter 2 for a discussion of the original concept of X’-theory as outlined in Chomsky (1970), which, in present-day terminology, is neither a word-formation system nor a matching system, but rather a spellout system.

2 Although I will reject this aspect of the BPS system, the logic here is a solid one, and follows, ironically enough, the same logic which guides lexicalist accounts. According to this logic, and insofar as some listing in natural language is inevitable, listedness should be made to perform as much grammatical work as is possible. If, indeed, there is no alternative to listing, e.g., cat as an N, then the most parsimonious system
syntactic primitive. Rather, categorial labels are properties only of terminals, and phrase markers are but the projection of those terminals, together with their categorial properties, and hence, effectively: \(<cat^{min}, (cat), (cat), \ldots, cat^{max}>\), \(<classification^{min}, (classification), (classification), \ldots, classification^{max}>\) etc. as well as \(cat^{min/max}\). It is worthwhile stressing, for the sake of explicitness, that the BPS system is not reducible to the listing of category-less lexical items; that is, it is not sufficient to characterize syntactic projections as \(<cat^{min}, (cat), (cat), \ldots, cat^{max}>\). Rather, \(cat\), or \(classification\), must be listed with a syntactic category, i.e. \(cat_N\), and hence both \(cat^{min}\) and \(cat^{max}\) are crucially also \(cat_N\). That this must be the case is obvious when one considers the fact that some constituents, but not others, may licitly merge with determiners, and that whatever information is associated with, e.g., \(cat\) and \(classification\) allowing them to merge with a determiner, but disallowing, e.g., \(classify\) to merge with a determiner, is formally equivalent to listing \(cat\) and \(classification\), but not \(classify\), as nouns. All the more so given the fact that the very same terminals that allow a determiner would also allow e.g. plural marking, again never possible with \(classify\), thereby showing a systematic clustering of properties, which we might as well label “\(N\)”.

There are, however, some fundamental problems with the assumption that phrase markers are by necessity the projection of category-labeled lexical terminals. At least one of these problems concerns the status of null nodes. Perhaps a couple of illustrations might be illuminating.

Consider, first, the well-known fact that the English complementizer \(that\) may be missing in some contexts, e.g. (1b), when compared to (1a). Within an approach that projects structure from terminals, there are two ways of accommodating this state of affairs. According to one, in (1a) the clausal complement is a CP but in (1b) it is a TP (or an equivalent thereof). According to the second alternative, in (1b) C projects from an abstract, phonologically unrealized complementizer. These two different options are in (2a, b) respectively:

(1) a. Genevieve said that Chikkie saw Dante on the roof of the Conservatoire.
   b. Genevieve said Chikkie saw Dante on the roof of the Conservatoire.

(2) a. Genevieve said [\(T\)-pst Chikkie saw Dante …]
   b. Genevieve said [\(C\)-feature \(C\)-feature [\(T\)-pst Chikkie saw Dante …]]

Now, as is well known, (1b), but not (1a), allows the embedded subject to move to the higher left periphery:

(3) a. *Who did Genevieve say that saw Dante on the roof of the Conservatoire?
   b. Who did Genevieve say saw Dante on the roof of the Conservatoire?

would dictate deriving, from that listed category, the predictable categorial specification of all instances of \(N\) which dominate it. The \(N\)-ness of nodes dominating \(cat\), then, would be inherited from the \(N\)-ness of \(cat\) (and see Collins 2002 for a system along such lines). To the extent that I will reject this approach, it is precisely because I will categorically deny the need to list \(cat\) as \(N\), opting instead for the claim that substantive “monomorphs”, roots, are devoid of categorial properties (and see work within the Distributed Morphology framework for a similar logic).
Under the structural option in (2a), an account might actually be readily available. In the absence of an intermediate CP in (2a), the movement of the subject is arguably local and hence possible. The account, nonetheless, encounters immediate problems, insofar as it requires the assumption that every (bridge) verb that allows a CP complement also allows a TP complement. As such it neglects to offer an explanation for a myriad of interpretational effects, including modal interpretation and the interpretation of tense, all arguably mediated through C, and all equally applicable to (1a) and (1b). As for option (2b), it, too, could presumably account for that-\(t\) effects, by the simple statement that the abstract complementizer under consideration is different from that exactly insofar as it does not create that-\(t\) effects. The “explanation”, one notes, is circular and non-falsifiable, capitalizing on what is its major typological shortcoming—a failure to capture the fact that, rather systematically, complementizers that fail to give rise to that-\(t\) effects are phonologically null, although, by assumption, the phonological properties of complementizers should be irrelevant. In turn, note, if one gives up on the assumption that all phrases project from lexical terminals, one could retain what is clearly the most natural account, namely, that when that is absent, C is truly empty and dominates no terminal whatsoever, and as such, is potentially an available escape hatch for subject movement.\(^3\)

A second illustration turns out to have very much the same properties, favoring the existence of radically empty nodes that could not have projected from a lexical terminal (and where by “radically empty node” I refer to a node that is devoid of any properties and is, as such, distinct from e.g. a null phonological realization of a pronoun). Consider the system proposed in Borer (2005a), in essence following various results of Milsark (1974), Diesing (1992), Szabolcsi (1989), Stowell (1991), Longobardi (1994), and others. According to that approach, D is essential for the emergence of individual reference (type \(<e>\)), and so-called weak nominals (i.e. non-specific indefinites, weak quantificational expressions) involve the presence of an empty D. Suppose an empty D, and possibly any empty node, is a variable in need of binding, and empty D, specifically, is subject to existential closure, thereby accounting for the weak reading. Suppose further, as has been argued rather extensively, that existential closure is structurally prevented from binding a D in a pre-verbal position. The resulting range of structures, from indefinite bare plurals to bare singulars (e.g. in Hebrew) to weak quantificational structures are in (4) (irrelevant details omitted; e=radically empty node):

\[
(4) \quad \begin{align*}
\text{a. } & [\text{DP } e] [\text{NP } \text{dogs }] \\
\text{b. } & [\text{DP } e [\# \text{ a/one}] [\text{NP } \text{dog }]]
\end{align*}
\]

\[\begin{align*}
\text{c. } & [\text{DP } e [\# \text{ some/three}] [\text{NP } \text{dogs }]]
\end{align*}\]

\(^3\) A third option would be to attribute the effects to some spellout mechanism, which would fail to spell out that in the presence of a subject trace. As the effect is restricted to subject traces, however, the formulation of such a spellout mechanism is not a trivial matter.
The analysis, we note, has clear merits, for it accounts for the fact that weak expressions are extremely frequently, typologically, barred in pre-verbal subject positions, as well as for the possibility for at least some weak determiners to occur with the definite article in English and other languages (e.g. *the many girls; the four boys*; etc.). In turn, the analysis, under this or any other execution, crucially relies on there being no terminal in D, and on the assumption that radically empty heads are in need of extra syntactic licensing. If, on the other hand, phrases are the projection of lexical terminals, an analysis along the lines of (4) cannot be maintained as such. In turn, modifications of the analysis so as to accommodate its fundamental insights turn out to be quite awkward. One could, for instance, assume that weak nominals are truncated structures and are not DPs altogether. Very unfortunately, that would result in a non-unified structure for argumental and individual reference. Nor is it obvious how such an account would handle the subject/object asymmetries frequently attested with weak nominals. Alternatively, one could postulate a phonologically null but syntactically real terminal in D, such as a variable feature or a “weak” determiner feature. But as in the case of null complementizers, under such an account the correlation between a variable feature or a weak determiner feature and the absence of phonological realization would become a coincidence, as would be the absence of the opposite configuration, i.e. a phonologically unrealized strong determiner alongside an obligatorily realized weak one. As it turns out, typologically (in languages which otherwise do realize determiners) it is exactly “null” determiners which correlate tenaciously with a weak interpretation and with positional restrictions barring them in pre-verbal positions. But why should that be so, if their “null-ness” is but a superficial failure of phonological realization?

The illustrations above concern functional nodes, and I return to the categorial properties of functional structure in greater detail in sections 6.2–6.4. Consider however the ramifications which a strict BPS approach has for non-functional vocabulary. I already noted, at some length, in Borer (2005a, b), that listing substantive vocabulary—what I referred to in Chapter 1 as Content units—together with their insertion environment (however derived), leads to a failure to capture the massive contextual variability that is attested with mono-morphemic non-functional terminals. I also noted there that the very same effects are attested relative to the categorial properties of such items, insofar as listing roots with a category fails to capture the massive categorial variability associated with them. Thus consider the

Further complicating the issue is the fact that bare QPs or NumPs/#Ps have been argued to receive a distinct interpretation from that of weak nominals (e.g. “measure phrases” of some sort). In order to distinguish between measure phrases and weak nominals in the absence of D, then, one would have to postulate an additional node, distinct from both D or Q/Num/#, which is responsible for weak nominals (possibly under D). But as it is not obvious what would populate that node, this node would need to remain phonologically empty, thus replicating exactly whatever problem exists for a phonologically empty D.

Importantly, the point of the illustrations from the domain of CP and DP is not to defend any one particular analysis of that-1 effects or weak nominals, but rather to give an illustration of the theoretical cost of forcing all categorial structure to project from lexically listed terminals, including features. The latter, we note, is an inevitable result of a strict application of the Bare Phrase Structure system.
example in (5), based on Borer (2005a), and taking our non-functional terminals, by definition roots, to be walk, boat, and finger:

(5)  
  a. The boat walked the finger.
  b. The finger boated the walk.
  c. The walk fingered the boat.

(5) illustrates the fact that non-functional terminals, roots, occur very frequently as both nouns and verbs. While some of the meanings in (5) may not be straightforward, it would be erroneous, in my view, to attribute whatever anomaly may be associated with some meaning to ungrammaticality, especially when compared with cases of truly ungrammatical instances of categorial selections such as those in (6b, c):

(6)  
  a. The brotherhood exemplified kindness.
  b. *The exemplify brotherhooded kindness.
  c. *The brotherhood kindnessed the exemplify.

If, however, syntactic category were to be perforce associated with the terminals in (5), it would mean that boat, walk, and finger would need to be listed with a category, and an independent account would be required to explain the rather clear contrast between the ungrammaticality of (6b, c) on the one hand, and the mere contextual oddity of (5a–c). Such an account, then, would need to accommodate the “homomorphic” occurrence in a different categorial environment of finger, walk, and boat, but not brotherhood, exemplify, and kindness. One could, for instance, conceive of listing each of finger, walk, and boat twice, once as N and once as V (but listing exemplify and brotherhood only once). A number of immediate problems, however, militate against such an account. First, double listing is extremely redundant. Second, for some reason, such double listing would need to be available extremely productively for mono-morphs (and compounds headed by mono-morphs) but not for derivatives (I return to this point at greater length in Chapter 7). Finally, the process exemplified in (5) is extremely productive synchronically, in that newly introduced vocabulary surfaces with verbal and nominal instantiations almost immediately (to wit, to email, to network, an embed ...), while older forms tend to actually become more canonical in a single categorial context. The logic of listing would dictate the opposite, however—listedness is presumably incremental and use-reinforced, and hence likely to increase, rather than decrease, for better established vocabulary. By a similar logic, one expects the most newly coined items, by assumption newly listed, to display the least variation, but instead, they show the most.

Finally, and rather ironically, the notion of category-less stems, as put forward in Chomsky (1970) (see Chapter 1, structure (2), essentially repeated here as (7)) is fundamentally inconsistent with a strict application of BPS, insofar as the structure in (7) fundamentally presupposes the existence of categorial structure independent of the properties of the terminals, an impossibility in BPS:

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6 See Chapter 7 for a further discussion of this generalization and its delimitation.
In what follows I will assume without further discussion that the double listing of forms such as walk\textsubscript{V}/walk\textsubscript{N}, finger\textsubscript{V}/finger\textsubscript{N} is prima facie disadvantageous, and, pending some overwhelming evidence in its favor, is to be rejected. In turn, I have already argued in detail in Part I of this work that the formation of complex words is available in the syntax and that as such their architecture is no different from that of complex phrases. All this points towards the existence of only one computational, hierarchy-building system, responsible, uniformly, for the construction of phrases, including “words”, the latter but phrases which happen to constitute a (language-specific) domain for the application of certain phonological rules.

In view of this, consider options for stating the relatedness of pairs such as walk\textsubscript{V}/walk\textsubscript{N}, finger\textsubscript{V}/finger\textsubscript{N}. One obvious option would be to assume that one of the forms, e.g. finger, is listed as N, and the verbal form is derived from it by means of \(\mathcal{O}_{\text{v}}\) affixation; walk is listed as V and the nominal form is derived from it, likewise by means of a zero affix, this time \(\mathcal{O}_{\text{n}}\). This option, note, is compatible with a strict interpretation of BPS, if we assume \(\mathcal{O}_{\text{n}}\) and \(\mathcal{O}_{\text{v}}\) are listed terminals, in the required sense, very much on a par with the already (by assumption) listed finger\textsubscript{N} and walk\textsubscript{V}. Under such an execution, not only will finger\textsubscript{N} project, but so will \(\mathcal{O}_{\text{v}}\) which merges with it. Crucially, note, under such an execution \(\mathcal{O}_{\text{n}}\) and \(\mathcal{O}_{\text{v}}\) are distinct terminals, and we do not expect them to share properties any more than we expect walk\textsubscript{V} and finger\textsubscript{N} to have much in common (or, for that matter, -ize\textsubscript{V} and -ness\textsubscript{N}):

\[
\begin{align*}
\text{(8) a.} & \quad \begin{array}{c}
\mathcal{O}_{\text{n}} \\
\end{array} & \quad \begin{array}{c}
\text{walk}_{\text{V}} \\
\end{array} \\
/\pi\text{finger, walk}/ \\
\text{b.} & \quad \begin{array}{c}
\mathcal{O}_{\text{v}} \\
\end{array} & \quad \begin{array}{c}
\text{finger}_{\text{N}} \\
\end{array} \\
/\pi\text{finger, walk}/
\end{align*}
\]

A second option would be to derive both the nominal and the verbal instantiations of walk and finger from a common source. This second option, likewise, is available in two versions. One, following the execution of much work within Distributed Morphology, is as depicted in (9). Note specifically that while \(n\) (realized as \(\mathcal{O}\)) and \(v\) (likewise realized as \(\mathcal{O}\)) may be viewed as lexical terminals in this system, the result is nonetheless in violation of a strict implementation of BPS due to the presence of a root, by assumption devoid of category and incapable of projecting. Note that here, too, we do not expect the zero instantiations of \(n\) and \(v\) to have much in common, insofar as their phonological realization is orthogonal to their featural value:
The final option, to be endorsed here (and see also Borer 2003, 2005a), is akin to the structure in (7), insofar as it subscribes to the view that roots are categorized by their syntactic merger environment, and as such is, as we already saw, inherently incompatible with the strict execution of BPS. It is nonetheless clearly distinct from (7) insofar as it assumes, rather crucially, that destruction is not the nominal realization of a root, but rather a complex, derived form, in which /πtion/ is the realization of a CN[v]-functor. In this approach, note, there are no zero-realized categorial instantiations which mediate either between the V and N instantiations or between the root and the categorial instantiation. Equally crucially, as we shall see, while the realization /πdestruction/ corresponds to (at least) bi-morphemic, branching structure, this is never the case under this instantiation for finger or walk which spell out a single terminal:

Chapter 7 is devoted to an in-detail argumentation against the existence in English of zero categorizers, be they zero instances of n and v, or zero instantiations of derivational categorial morphemes, as in more traditional approaches. Anticipating these conclusions, we note that the remaining option is as in (10), and indeed, I will adopt here the contextual approach to categorization as delineated rather broadly in (10), and as already used in the executions in Chapters 2–5.7 This option, however, requires giving up on the assumption that categorial

\footnote{Conversion" as such, is an extremely difficult operation to represent syntactically, and thus if complex words are to be formed syntactically, must be excluded from our formal vocabulary. On the other hand, insofar as Conversion is an operation which relates pairs of phonologically identical but categorially distinct mono-morphs, as it typically appears to be, these are precisely the properties of the categorization system to be presented here, in which pairs such as walk, walk, finger, finger, are, indeed, mono-morphs and thus equally complex. See section 6.2 as well as Chapter 7 for further discussion.}

---

(9) a. 

```
    0
   /\  /
  /\  /
 n   √FINGER; √WALK
    \   /
      \  /
       \/
       \ /
     /   /
    /   /
 n∅finger, walk/
```

b. 

```
    0
   /\  /
  /\  /
 v   √FINGER; √WALK
    \   /
      \  /
       \/
       \ /
     /   /
    /   /
 v∅finger, walk/
```

Chapter 7 is devoted to an in-detail argumentation against the existence in English of zero categorizers, be they zero instances of n and v, or zero instantiations of derivational categorial morphemes, as in more traditional approaches. Anticipating these conclusions, we note that the remaining option is as in (10), and indeed, I will adopt here the contextual approach to categorization as delineated rather broadly in (10), and as already used in the executions in Chapters 2–5.7 This option, however, requires giving up on the assumption that categorial

\footnote{Conversion" as such, is an extremely difficult operation to represent syntactically, and thus if complex words are to be formed syntactically, must be excluded from our formal vocabulary. On the other hand, insofar as Conversion is an operation which relates pairs of phonologically identical but categorially distinct mono-morphs, as it typically appears to be, these are precisely the properties of the categorization system to be presented here, in which pairs such as walk, walk, finger, finger, are, indeed, mono-morphs and thus equally complex. See section 6.2 as well as Chapter 7 for further discussion.}

---

(10) a. 

```
    T,Asp,Cn[v]
    \   /
     \  /
      \/
       \ /
        /  /
       /
 T,Asp,Cn[v] [c=Vπ√FINGER; π√WALK]
      /   /
     /   /
 n∅ed; en; ing/ finger, walk/
```

b. 

```
    D, #, Div, Cn[x]
    \   /
     \  /
      \/
       \ /
        /  /
       /
 D, #, Div, Cn[x] [c=Vπ√FINGER; π√WALK]
      /   /
     /   /
 n∅the; three; -s; -al/ finger, walk/
```

c. 

```
    Cn[v]
    \   /
     \  /
      \/
       \ /
        /  /
       /
 Cn[v] [c=Vπ√FINGER; π√WALK]
      /   /
     /   /
 n∅ing/ finger, walk/
```

information comes from listed terminals, be they roots or functional elements. While in e.g. (10a) there is a constituent \( \{_{C=V}^{\pi_{\sqrt{\text{FINGER}}}} \} \) which is \( V \)-equivalent, and hence may project \( V \), this information is not listed with \( ^{\pi_{\sqrt{\text{FINGER}}}} \), and is specifically not its inherent property but a property it comes to have through its merger context. The functors which are responsible for the emergence of such a \( V \)-equivalent context, in turn, themselves either project as ExP-segments (and see section 6.3 for their categorial properties), or, if C-functors, may project a different category altogether (e.g. N). If we are to subscribe to the structures in (10a–c), then, we must give up on the idea that categorial information always projects from terminals. As for roots, we must give up on the idea that they have a category altogether, assuming, rather, that whatever categorial properties they (appear to) have, emerge in some other way.\(^8\)

Recall, now, that our starting point concerned the attempt to reduce a fundamental redundancy in previous systems, whereby category was specified twice—once in listed entries, and yet another time as labels of phrasal constituents. In BPS, as we noted, Chomsky (1995a) attempted to do away with this redundancy by eliminating categorial labels, as primitives, on phrasal constituents. The system, in turn, crucially involved the projection of categorial information from listed terminals, and hence entailed the existence of a terminal with categorial properties as the \( X_{\text{min}} \) of all syntactic projections. We reviewed a number of problems with this specific assumption both within the domain of functors and within the domain of non-functional terminals, roots, to conclude that such projection of categorial information exclusively from an otherwise listed terminal is inconsistent with an attempt to derive complex words syntactically—ultimately, the main aim of the present project.

6.1.2 Architecture

While the BPS assumption that projection must proceed from labeled terminals is incompatible with the existence of non-categorial roots, and hence with the syntactic formation of words from them, much else in the architecture of BPS is particularly suitable for the formation of complex words syntactically, sharply contrasting, as such, with \( X' \)-theory. In fact, for the past two decades, and within the framework of the ongoing debate on the existence, or lack thereof, of an independent word formation component, the incompatibility of word structure with \( X' \)-theory has been repeatedly noted and highlighted, and consistently used to argue against reintegrating the formation of complex words into the syntax. The matter is reviewed in some detail in Lieber (1992) as well as in Borer (1998), and more recently by Ackema and Neeleman (2004). All point out the inherent incompatibility between the hierarchical properties of word-internal structures and \( X' \)-theory. To wit, consider a complex word such as *compositional*, focusing specifically on an attempt to

\(^8\) Another BPS-inspired option would be to have category-less roots project, giving rise to a RootP, a categorially unspecified syntactic phrase (see especially Harley 2009a; but also Embick 2004). For some comments on the empirical and conceptual ramifications of this claim see Chapter 12, section 2.3.
model the relationship between the instances of N and A within X’-theory. A rather brute force application would yield the structure in (11):

\[
\begin{array}{c}
\text{V} \\
/ \text{N}^0 \\
/ \text{A}^0 \\
/ \text{A}' \\
/ \text{N}'
\end{array}
\]

(11), in turn, is flawed in a number of ways, some more serious than others. There is no N0 or A0, note, nor does V project, leaving the overall compatibility of the structure with X’-theory in doubt. In general, there is little evidence, or need, for the type of projection-internal structure one finds in syntactic constituents that was used to lend support to the tripartite projection in X’-theory—there is no specifier in any obvious sense, nor is the sister of the head semantically selected in any sense, a standard assumption regarding complements. More serious, however, is the fact that, formally speaking, and as has been noted in the literature very frequently, morphological structures exhibit recursion at a very local level. To capture the properties of morphological structures, both instances of N in (11) would effectively need to be cases of N0, and both instances of A, cases of A0. The reason is that -al, as an A suffix, need not attach to N0, but may attach to N0 as well, as in (12a), or alternatively, -al would be specified as attaching to any projection of N, making its status, with respect to X’-theory, rather unclear. Nor do other affixes escape this conundrum. To wit, -ity, which could enter the structure in (12b), thereby allowing attachment to a (hypothetical) A’ (or A'0) also attaches to underived stems, presumably A0, such as (12c):

\[
\begin{array}{c}
\text{V} \\
/ \text{N}^0 \\
/ \text{A}^0 \\
/ \text{A}' \\
/ \text{N}'
\end{array}
\]

The unfortunate lack of clarity, relative to X’-theory, of morphological structures can be well illustrated when we consider an attempt to merge morphological structures with additional constituents. Under the plausible assumption that by X’-theory kind and unkind are as in (13), the consequent assumption must be not only that e.g. -ness attaches to both A and A’, but so does e.g. very:
The situation is an entirely general one, and hence listing affixes as taking a disjunction of projections as their complements \((A^0, A', A'')\) as well as all modifiers as taking all projections of such categories would clearly amount to missing the point, nor is such situation typically attested in \(X'\)-theoretic configurations (e.g. \(T\) does not in actuality merge with \(\{V^0, V', V''\}\)). Rather, the conclusion frequently drawn (most recently by Ackema and Neeleman 2004), is that it provides evidence for the formally distinct nature of syntax and word formation.

Viewed from a different perspective, the reason for the formal incompatibility here stems precisely from the very central property of \(X'\)-theory that was abandoned, summarily, in the BPS system. From the perspective of \(X'\)-theory, bar levels such as \(X^0, X', \text{ and } X''\) are primitives with distinct formal properties. A construct such as \(N'\) is a conjunction of whatever properties it has by virtue of being \([N]\) and whatever properties it has by virtue of being an instance of \(X'\). The former gives it categorial identity, the latter states a network of dependencies which it, indeed, at times must enter (e.g. \(X'\) must dominate \(X^0\); \(X'\) may dominate a complement, etc.). These properties, in turn, are primitives. The \(X'\) property of e.g. \(N'\) is explicitly a primitive, and not derived, e.g. from immediately dominating \(N^0\). The property \([N]\) is likewise a primitive, and is not inherited from \(N^0\) or \(N''\) in any way. With the benefit of hindsight, the redundancy is evident, as is the inherent elegance of the BPS-based substitute. We already noted that in BPS, indeed, there are no primitive categorial labels associated with structures as such. Beyond that, and considerably more importantly, projection-internal relationships are no longer encoded through
a line of primitive bar levels. There no longer is N⁰, N′, or N″, nor is any projection line limited to three (core) members. Rather, definitionally, the lowest instantiation of a categorial projection is X\text{min}, and the highest is X\text{max}. X\text{min}, definitionally, cannot dominate any structure. X\text{max}, by definition, cannot be dominated by another instance of X (belonging to the same projection). The nodes intervening between X\text{min} and X\text{max}, if there are any, must be of type X. There can be any number of these intermediate nodes, including none. In fact, the very same node may be X\text{min/mix}, simultaneously, thereby disallowing any element of type X to dominate it, and barring anything from being embedded under it. Relative to the structures in \(11\)–\(12\), we now note that all affixes are cases of X\text{min}, and that the constituent with which they merge is always X\text{max}. As a consequence, the affix must project:

\[
\begin{align*}
(14) & \quad \text{a. } A\text{max} \\
& \quad \text{N\text{min/mix} A\text{min}} \\
& \quad \text{form} \\
& \quad \text{-al} \\
& \quad \text{b. } N\text{max} \\
& \quad \text{A\text{max}} \\
& \quad \text{N\text{min}} \\
& \quad \text{-ity} \\
& \quad \text{c. } N\text{max} \\
& \quad \text{A\text{min/mix} N\text{min}} \\
& \quad \text{fecund} \\
& \quad \text{-ity} \\
& \quad \text{V\text{min/mix} N\text{min}} \\
& \quad \text{compose} \\
& \quad \text{-tion}
\end{align*}
\]

In turn, these are exactly the properties we find in syntactic merger. Given the merger of two constituents, A,B, it is always the case that one of them will project, and the other one will be a case of X\text{max}, giving us the set of configurations in (15) (linear order issues set aside; see section 6.4 for discussion):

\[
(15) \begin{align*}
& \quad \text{a. } A\text{max} \\
& \quad \text{A\text{min} B\text{min/mix}} \\
& \quad \text{\{that TP\}} \\
& \quad \text{\{about John\}} \\
& \quad \text{b. } A\text{max} \\
& \quad \text{B\text{min/mix}} \\
& \quad \text{Mary} \\
& \quad \text{(SUBJ) A\text{min} W\text{min/mix}} \\
& \quad \text{\{proud (of) her son\}}
\end{align*}
\]

Not only is BPS easily extendible to the formation of complex words, note, but given BPS, the absence of syntactic structures of the type in (14) must be stipulated. The issue is perhaps easiest to see in the context of compounds, where one could not resort to statements about the particular properties of affixes which might restrict their syntactic distribution. Thus observe the following compounds (and note that here we can easily construct cases with projections that include more than just two members):
The derivation of the compounds in (16) via Merge is a straightforward matter in a BPS-type approach. (16c) for example involves the initial merger of two roots, call them \([\text{C}_\pi^\text{HEAD}]\) and \([\text{C}_\pi^\text{STONE}]\). Setting aside for the time being the determination of the projecting member (but see section 6.4), we note that one member does project, in this case \([\text{C}_\pi^\text{HEAD}]\). Upon additional merger with a third root, \([\text{C}_\pi^\text{STONE}]\), \([\text{C}_\pi^\text{HEAD}]\) proceeds to project again, with the highest instantiation of \([\text{C}_\pi^\text{HEAD}]\) being \([\text{C}_\pi^\text{HEAD}]_{\text{max}}\) and the lowest \([\text{C}_\pi^\text{HEAD}]_{\text{min}}\). Finally, and by assumption in its syntactic context, \([\text{C}_\pi^\text{HEAD}]\) is rendered N-equivalent, e.g. by a determiner, making its lowest instantiation N_{\text{min}} and its highest instantiation N_{\text{max}}. \([\text{C}_\pi^\text{STONE}]\), in turn, is an instance of C_{\text{max/min}}, being both the highest and the lowest instantiation of its kind. The configuration in (16c) thus results.\(^9\) While matters of linearization remain outstanding (see section 6.4), any BPS-based approach to phrase structure would actually need to avail itself of a stipulation to exclude the derivations in (16).

Given the discussion above, and based on the relevant premises of BPS, (17) is a summary of the architectural assumptions adopted in this work:

\(^9\) For reasons of space, properties of primary compounds remain largely undiscussed in this work. For concreteness, suppose we assume the existence of an English-specific categorization context, the Compound Frame, which renders the left member of the compound (the circled constituent) in the configuration in (i) +N-equivalent (N/A-equivalent). It is worthwhile noting that while the categorization frame here is certainly contextual, it is contingent on a structural configuration rather than on the properties of a functor. For a more detailed discussion see Borer (forthcoming):

i. (the)

\[
\begin{align*}
[\text{C}_\pi^\text{HEAD}]_{\text{min}} & & [\text{C}_\pi^\text{HEAD}]_{\text{min}} \\
\text{+N-equivalent} & & \\
[\text{C}_\pi^\text{STONE}]_{\text{min/max}} & & [\text{C}_\pi^\text{HEAD}]_{\text{max}}
\end{align*}
\]
a. Complex constituents are constructed through incremental binary merger.  
b. Binary mergers are inherently asymmetrical, with one member of the pair projecting, and the other, definitionally, an instance of X\textsuperscript{max}.  
c. Notwithstanding linearization restrictions which are fundamentally external to the merger system as such, either member of the pair may project.

I will, however, reject the BPS assumption that syntactic structure projects exclusively from properties of listed terminals, with categorial labels, or alternatively, without labels altogether (see Collins 2002 for the latter assumption). I already noted above the disadvantages of the system both for roots, by assumption devoid of category, and for functional heads, where postulating radically empty heads turns out to give rise to considerable explanatory consequences. Even more radically, and as the reader may recall from the discussion in Chapter 1 (and see section 6.2.1 below for some review), I argued that segments of Extended Projections, ExP-segments, comprise, precisely, radically empty terminals, instances of \llangle c \rrangle; these are in turn assigned range as well as categorial membership by S-functors, with the latter potentially occupying a rather broad range of syntactic positions, including specifiers, adverbs, and adjuncts. It thus emerges that the present system does not just subscribe to the view that categorial information cannot be listed with (projecting) terminals, but is invested in its opposite for both roots and ExP-segments.

Having put in place a preliminary architecture for the syntactic formation of complex words based on the combinatorial merger operations available through BPS and along the lines in (14) and (16), we are now in a position to elaborate on the type of questions that emerge within such an execution. For instance, what determines projection and hence headedness? Why, for instance, is it -\textit{al} that projects in (14a) and not \textit{form}? Why is it -\textit{ity} that projects in (14b) and not -\textit{al}, etc.? Even more fundamentally, and from the point of view of the architectural considerations just outlined, what \textbf{are} -\textit{ity} and -\textit{al}? In Chapter 1 I proposed that these are C-functors, (i.e. an instance of C\textsubscript{N[A]}\text{spelling out as /p\textit{ity}/ and an instance of C\textsubscript{A[N]}\text{spelling out as /p\textit{al}/} and that as such, this is a class of functors distinct from S-functors. What, however, is the evidence for the distinction, and how do the formal properties of C-functors bear on the structure of complex words? Turning to roots, I proposed that the reservoir of roots, so called, is identical to the reservoir of all phonological indices in a language. Even more broadly, arguably it corresponds to the reservoir of all possible phonological representations in the language altogether, with or without an index. What, however, are the consequences of this assumption? What is an “index” in the relevant sense, and what evidence can be summoned in its favor?

A second set of questions regards issues which we can broadly characterize as involving locality. Salient among such questions are the mechanisms which allow certain stems, or possibly roots, to choose certain affixes (e.g. govern-\textit{ment} but arriv-\textit{al}). Within this domain we also find questions concerning the applicability to syntactically derived words of distinctions such as morpheme-boundary type, or alternatively, level-based affixation. Within approaches that subscribe to the Level Ordering Hypothesis, affixes with a + boundary define a distinct phonological, morphological, and interpretational domain which must be embedded within the
domain defined by # boundaries. Can this picture, to the extent that it is valid, be mapped onto a syntactic representation of complex words? By extension, we must also ask whether the notion “phase”, as in Chomsky (2001) and subsequent developments, is relevant for complex structures such as those in (14) and (16), and if so, how and what are its ramifications? The determination of what may or may not be a phase within complex words, note, is particularly salient when we consider the rather complex structures proposed for AS-nominals in Chapters 3–5, and where, by assumption, a derivative such as formation involves moving form through successive mergers and across substantial structure to re-merge with -ation.

Finally, and rather importantly, how does Content emerge in this system, especially given the claim that neither roots nor functors have Content, as such (although, note, the latter may and indeed at times must have a semantically rigid designation)?

The remainder of this chapter as well as Chapters 7–10 are devoted to an elucidation of issues concerning the actual unfolding of derivations. In the next few sections of Chapter 6, I will embark upon attempting to make more precise the nature of functors. Section 6.2 discusses the properties of C-functors. In section 6.3 I compare the formal properties of C-functors and S-functors by way of highlighting their distinct nature and the need for both. The distinction will be anchored in the observation that C-functors are not ExP-segments, but S-functors definitionally are (range assignors to heads of) ExP-segments. In that context, a specific proposal is put forward on the formal properties of Extended Projections. A tentative note on adjunction, linearization, and prefixes concludes this chapter.

In Chapter 7 I take on the matter of categorization for otherwise category-less roots, and Chapter 8 is an in-depth discussion of the properties of roots. Chapter 9 takes on the assignment of Content and issues of spellout, proposing a model of the former in the context of the latter, and showing that the appropriate description of the facts must be derivational, rather than representational. The final step of the execution is in Chapter 10, taking this last conclusion as its starting point and proposing a phase-based account for the emergence of complex words.

Before proceeding, it is worthwhile noting, yet again, that at the very least, the information in (18) must remain listed, and it is my firm belief that this information must remain listed in all accounts of natural language that subscribe to the arbitrariness of the sign. While approaches may vary as to what functors are or are not, or on what possible functions do or do not exist, it is hard to envision a model of language which has no functors altogether or no listed functions, or, for that matter, a model of language in which some phonological information or non-compositional Content need not be listed. In turn, not all listed items have the same properties, nor do they interact with the structure in identical ways. Their properties and their emergence are thus at the core of any grammatical explanation:

(18) What (it appears) we must list:
   a. Functors and their function
   b. Phonological indices (roots and root-specific phonological information; functors, if any, e.g. /p the/)
   c. Non-compositional Content for both simple and complex constituents
6.2 C-functors

6.2.1 S-functors and C-functors—an overview

In Chapter 1, I suggested that there exists a reservoir of “functors”, each effectively naming a rigidly designating function. I further suggested that there are two formally distinct functors: S-functors and C-functors. In elaborating on the nature of S-functors, I suggested that their main function is a semantic one, and consists of assigning semantic range to an otherwise open syntactic position, effectively a node merging as an empty set. To illustrate, if we take THE\textsuperscript{0} to be an S-functor naming the function THE, it will assign the semantic range THE (whatever it turns out to be) to an empty syntactic position. Plausibly THE shares a set of semantic properties with e.g. THAT or THIS and possibly other functors. Whatever it is that is shared among such functors (and which is syntactically relevant) is what we may refer to as D.\textsuperscript{10} That the (projecting) open syntactic position assigned range by THE comes to be marked as \(\ll<e>_D\), thus amounts to a (syntactically instantiated) generalization over the types of functors that can assign range to the same empty position, and the placement of that node, call it D, relative to other nodes within the Extended Projection (e.g. above or below \(\ll<e>_\#\). See section 6.3 for a fuller discussion).\textsuperscript{11}

\begin{equation}
\text{(19)}
\end{equation}

\begin{tikzpicture}
  \node (ZP) {ZP};
  \node (D) at (1,0) {D};
  \node (Dmax) at (0,1.5) {D\textsubscript{max}};
  \node (THE) at (-1,-1) {THE\textsuperscript{0}};
  \node (eTHE) at (-1.5,-1.5) {\ll<e>\text{THE}\textsubscript{D}};
  \node (headpair) at (0.5,-2) {\text{\textless Head-Pair}};
  \path (ZP) edge node [left] {} (THE);
  \path (THE) edge node [left] {} (eTHE);
  \path (eTHE) edge node [left] {} (headpair);
\end{tikzpicture}

Importantly, instances of projecting \(\ll<e>\) are possible not only in the context of free functional morphs such as THE (with the presumed phonological index giving

\textsuperscript{10} See Chapter 1, section 5.1, and section 6.3 below on formal labels.

\textsuperscript{11} The system does not exclude the possibility that, e.g., THE names more than one function (i.e. is ambiguous) or that its function is somewhat differently interpreted in conjunction with distinct formal contexts. What it \textit{does} exclude is the possibility that THE is altogether devoid of rigid designation or fixed selectional properties.

In section 6.1.1, recall, I discussed the status of instances of \(\ll<e>_\#\) in which no range assignor is available, or so it appeared, and where, I argued, grammaticality may only emerge in the context of existential closure. In the context of the present text discussion, this assertion amounts to stating that \(\ll<e>\), as such, is illicit, and that existential closure amounts to range assignment very much along the lines of range potentially assigned to \(\ll<e>_\#\) by adverbs of quantification, discussed in some detail in Chapter 1. In both cases, it stands to reason that such range assignment would also be complicit in labeling the relevant open value, and thus as \(\ll<e^{\exists}>\_\#\) and \(\ll<e^{\text{MOST}}>\_\#\) respectively. What is clearly required, in this context, is postulating both \(\exists\) and MOST(LY) as functors, one an instance of \(\exists\textsuperscript{11}\), and the other an instance of MOST\textsuperscript{a}. 
rise to /π/ the /), but also when the S-functor member of the head-pair is abstract, where by “abstract” I refer to functors that have no phonological index, e.g. PST. In such cases, by assumption, a phonologically realizable element must re-merge, effectively, in the position of 〈e〉, thus coming to be the recipient of the relevant value associated with the abstract S-functor. The emerging representation is as in (20). Note that the head V re-merging as 〈V^{PST}_π〉 in (20) may be either a (category equivalent) root or a complex derivative. What is of significance from the perspective of the system here, however, is the fact that the re-merger as 〈V^{PST}_π〉 does not amount to the addition of structural complexity. By this logic, and under the assumption that e.g. [C=V_p√jump] is not a branching structure, neither is 〈[C=V_p√jump\^{PST}_π]〉. Similarly, and assuming that, e.g., behead is a branching, bi-morphemic structure, so is 〈[V_{behead}^{PST}_π]〉. More importantly, and noting that the head-pair in (19) is structurally identical to the head-pair in (20), in both (19) and (20), phonological realization corresponds to the single (circled) terminal. While in (19) it is the S-functor, in (20) it is the re-merged head in /π/ jumped; ate/ (and see Chapter 1, section 3.2 for the realizational logic employed here in favoring a mono-morphemic approach to English past tense. See directly below for more relevant discussion):

While S-functors are semantic, C-functors, I suggested, are syntactic, with their fundamental function being the division of categorial space. Specifically, they project a particular category type and define a complementary categorial space, their Categorial Complement Space (CCS). C-functors, I noted, may have a semantic value (e.g., ABLE, ER, ING). However, and unlike S-functors, such a semantic value, if present, is neither sufficient nor necessary to characterize their categorial properties. Insofar as C-functors are functions over syntactic categories, they are perforce part of the syntactic computation and part of the syntactic architecture. It thus emerges, rather ironically, that it is so-called “derivation” which is syntactic, rather than so-called “inflection”. This said, we note importantly that notions such as “derivation” and “inflection” are altogether a misnomer from the perspective of the present approach. Specifically, “inflection”—if we take such a term to refer e.g. to the realization of past tense or plural in English—is, in the model being developed here, no more than a particular phonological realization scheme associated with abstract S-functors, themselves a language-specific and potentially accidental subset of S-functors. Thus in English, THE has a phonological index, by assumption, but not so PST. The opposite picture, i.e. an abstract THE but a phonologically indexed
occurrence of tense is not only plausible, it is directly attested. As we shall see in section 6.3, what makes the formal notion of S-functors a coherent one and as such distinct from the formal notion C-functor is not a realization mode, but the fact that they are range assignors to empty sets which in turn come to be segments of Extended Projections, ExP-segments.

We note now that the syntactic complexity of, e.g., English *the cat* is not in dispute, nor does it traditionally come under the discussion of word formation, syntactic or otherwise, although the status of *the* as a grammatical formative, and hence, in our terms, a functor, is not in dispute either. What is in dispute, however, is whether there is a constituent which may be spelled out as *jumped* or *ate*, respectively, and which is of equal complexity to a constituent that may be spelled out as *jump* and *eat*; similarly, whether there is a constituent that may be spelled out as formal or classify but is nonetheless as syntactically complex as form or class. Consulting, yet again, the structures in (19)–(20), note that the question specifically does not concern the overall complexity of the structure in which such representations are embedded, insofar as we can take it for granted that for both structures, an equivalent structure without a functor (be it THE or PST) is less complex. The question, rather, concerns the nature of correspondence between structure and spellout. A representation such as \(/\pi\text{the cat}/\) perforce does not correspond to a single terminal and is thus more appropriately \(/\pi\text{the}/+/\pi\text{cat}/\). If the structure in (20) is on the right track, however, then *ate* and *jumped* do not correspond to *the cat*. Rather, they correspond to *cat* alone. What corresponds to *the*, in turn, is an abstract, unrealized S-functor. In other words, and continuing to take *the cat* as our point of comparison, the representation of *jumped* or *ate* is \(/\pi\emptyset/+/\pi\{\text{jumped; ate}\}/\).

Following a similar expository line, a similar question applies to e.g. \(/\pi\text{classify}/\). Does *classify* represent the spellout of a single, non-branching terminal, as presumably is the case for e.g. \(/\pi\text{class}/\), or rather, is it \(/\pi\text{class}/+/\pi\text{ify}/\), on a par with \(/\pi\text{the}/+/\pi\text{cat}/\), or maybe \(/\pi\emptyset/+/\pi\text{classify}/\) like \(/\pi\emptyset/+/\pi\{\text{ate; jumped}\}/\)? By extension, then, the question is whether the (presupposed) relatedness of *eat* to *ate* or *jump to jumped* is to be captured by appealing to the same formal mechanism which relates *class* and *classify or form and formal*.

A brief general perusal of the answers given in the literature to these questions reveals the entire range of possible answers, diverging both along their approach to morphemes in general, and along their approach to the desirability, or lack thereof, of a unified treatment for “inflection” and “derivation”. To illustrate: Beard (1995) denies the existence of added terminals for both “inflection” and “derivation” (“morphemes”, rather, are names for operations in his system). As a result, in his system, the relative complexity of *jump, jumped, eat, ate, class, and classify* is identical, or more accurately, is largely (morphologically) irrelevant. In turn, and insofar as *class* is related in some fashion to *classify*, that relation is formally of the same sort as that which holds between *jump* and *jumped* (and see also Aronoff 1994). When we turn to Halle and Marantz (1993), or Embick and Marantz (2008) and Embick (2010), we find that like Beard (1995), they subscribe to the view that the relations between *eat* and *ate* should be characterized along the same line as those which hold between *class* and *classify*. However, unlike Beard, they subscribe to the
view that morphemes are terminals. As a result, and insofar as classify the verb is derived from class the noun (or more accurately class the root), both jumped and classify are more complex than jump or class, respectively. Finally, while Anderson (1982, 1992) subscribes to the view that the relationship between jump and jumped, or eat and ate does not add structural complexity, he does assume that classify, derived from class, gives rise to increased structural complexity. Anderson, then, retains some measure of distinction between “inflection” and “derivation”, and specifically, allows for morphemes as terminals in the latter (albeit in a non-syntactic WF component), but not in the former.12

The answer to be given to these questions here is most akin to this last perspective. I already outlined in some detail the claim that forms such as jumped and ate are no more complex than jump and eat.13 In turn, I will endorse the view that the relationship between class and classify involves increased structural complexity, and by extension, that there is a direct sense in which classify is derived from class.

6.2.2 C-functors in a root-based system: categorial selection?

Like S-functors, C-functors are rigid designators, where by “rigid designation”, recall, I refer not only to a semantic function, but any function, be it semantic or syntactic, which is constant across derivations and contexts. Unlike S-functors, however, they are not modifiers, nor do they assign range to otherwise empty heads. In fact, a closer examination of their properties reveals that they are the most endoskeletal or endocentric objects in an otherwise exoskeletal system, in having, in essence, the complete set of formal properties typically associated with, e.g., Chomsky’s (1965) lexical entries. The table in (21) may serve as an illustration of this fact, comparing some of the proposed formal properties of C-functors with those of S-functors on the one hand, and those of roots, on the other hand (CCS=Categorial Complement Space, effectively subcategorization):14

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12 See also Matthews (1972, 1991) on a formally distinct approach to “inflection” and “derivation”.
13 As the central subject matter of this book is “derivation”, no attempt is made here at a fully articulated mapping between representations such as e.g. /VPST; PL.3/ and an actual realization, although the account does tacitly assume the existence of a sufficiently phonologically specific list, a paradigm, in conjunction with each (relevant) phonological index, complete, presumably, with default values for exponents and so on. It is important to stress, however, and contrary to Aronoff (1994), that the “paradigm” under consideration here does not include slots for the realization of C-functors. The choice of derivational affixal realization certainly can be conditioned by properties of the root, and root allomorphs certainly are at times conditioned by derivational affixation, but such conditioning, when compared to “inflection” is minimal; it routinely allows for more than a single realization (e.g., transmission/transmittal); and, for roots, can typically be characterized, although probably not triggered, by the phonological environment, rather than by the structural complexity as such (e.g. ceive → cept /__[+front], as in susceptible vs. conceivable).
14 A note on notation may be in order. (Reference to) spellout, regardless of framework, is marked as italics encased in slashes and a π-superscript (no attempt is made at accurate phonological representations, however). All semantic functions (S- and C-) are capitalized, e.g. THE, ABLE, PST (with the exception of n, a, and v, categorical functions within Distributed Morphology). Roots, except in XSM, are in small caps and are marked with capitals. Roots as phonological indices, as in XSM, are supplemented by a π-superscript. Otherwise unmarked italics (e.g., annuity, -al) are intended as theory-neutral references. With the exception of n, a, and v, bold italics are reserved for prefixes, cases, I assume, of incorporated particles. See section 6.4 for discussion.
That many C-functors (e.g. \(C_A[N]=/\pi\text{all}/\), \(C_N[V]=/\pi\text{ation}/\), \(C_A[V]=/\pi\text{ive}/\)) do not exhibit semantic selection is relatively straightforward. It is hard to see, in compositional cases, what e.g. ATION\(_N[V]\) is adding to \textit{classify} in \textit{classification} beyond making it an N, in turn potentially embedded under DP and hence referential, or what \(AL_A[N]\) would be adding to \textit{classification} in \textit{classiﬁcational} beyond making it A and hence potentially embedded in a predicate structure. A clear illustration of such an absence of semantic properties emerges when we consider triplets such as those in (22):

(22)  
\begin{enumerate}
  \item concerned, sympathetic, kind  
  \item cruel, malicious, vindictive
\end{enumerate}

Insofar as \textit{kind} and \textit{cruel} can convey a Content which is close enough to that which is conveyed by the more complex forms, it is clear that complexity, in itself, plays no role. It also appears rather clear that ED\(_A[V/N]\), IC\(_A[N]\), and OUS\(_A[N]\), could all be equally happily translated into the meaning of \textit{with} (concern; sympathy; malice), further showing that these sufﬁxes, as such, have little impact on the emerging Content. Finally, note, the actual category of the base has little effect on the emerging Content as well, with e.g. \textit{vindictive} having a V base (\textit{vindicate}) and \textit{malicious} having

C-functors, when devoid of a semantic function, are notated as \(C_X[Y]\), with X standing for the categorial value projected, and [Y] for the CCS (Categorial Complement Space). The fact that \(C_N[V]\) may be realized as \{\textit{ation}, \textit{ence}, \textit{ance}, \textit{al}, \textit{ment}\} is otherwise not reﬂected in the representation. C-functors which happen to have a semantic function are named as such (e.g. ABLE\(_A[V]\) vs. \(C_A[V]\), the latter e.g. with the spellout /\pi\text{ive}/\). This general notation notwithstanding, the reader will ﬁnd references to e.g. ATK (\textit{ation and kin}; \(C_N[V]\)) or ATK\(_N[V]\), as well as to IFY or IFY\(_V[N]\) used to facilitate exposition where what is under consideration are properties of that particular instantiation, although neither ATK nor IFY are semantic functions.

\[15\] It is at least plausible to assume that in the absence of a category, notions such as maximal and minimal may be vacuous, thereby making properties (b) and (d) in the case of S-functors contingent on property (a). All the more so, we note, if roots can only project in the context of being categorized. The latter, however, is by no means universally agreed upon, a matter I return to directly below. Beyond this, the correlation, while attractive, is not pursued further insofar as it involves the properties of S-functors, altogether not the central focus of this work.

\[16\] Note, in this context, that while the (head) root in the compound in (16) seems to project without a category, such a category does come to be associated contextually with the projection as a whole.
an N base (malice). It thus appears that beyond converting, e.g., vindicate or malice, respectively, into A forms (and with the obvious syntactic consequences), OUS_A[N] or IVE_A[V] are accomplishing nothing here that could be considered semantic selection, nor is the semantic outcome, whatever it might be, contingent on the categorial specifics of their CCS.

It is thus clear that S-selection of any sort is not necessary for C-functions. This notwithstanding, C-functors sometimes do have a semantic value. As we already noted, ABLE is a modal, and ING, as in Chapter 4 (and see also Chapter 12), is atelic and agentive. It is worth noting, however, that such semantics, even when present, does not determine their CSS-selection, nor is it clear that it is a transitive function of any sort, making its existence not sufficient to derive meaningfully any of the properties of C-functors. By way of illustration, consider the C-functor LESS_A[N]. It seems relatively obvious that it does have a semantic value, and specifically, let us take it to have the meaning LACKING. In conjunction with its complement, we note, this is quite reasonable, (cheerless = lacking cheer; airless = lacking air; etc.). We note, first, that while LACKING presumably does require an argument, it is not at all obvious why LACKING should take an N complement, rather than an A or a V or an ADV for that matter (e.g. *instantiateless 'failing to instantiate'; *obviousless 'lacking the property "obvious"' etc.). There is no way, then, to derive the fact that LESS has an N CCS from the interpretation of LACKING. Going further, and bearing in mind that LESS does have N as its CCS, we note that the specific semantic interpretation that emerges from the conjunction of LESS and its CCS need not be compositional altogether. Thus consider helpless or harmless. Helpless certainly does entail lacking something, but of what, exactly? On its most salient reading, it is more akin to powerless or, at best, lacking the ability to help oneself. Nor does harmless mean lacking harm. These are, plausibly, cases of a non-compositional reading for N-LESS constituents, but what is worthy of note is that the semantic meaning of LACKING continues to be associated with the occurrence of LESS in both harmless (presumably lacking the ability to do harm) and helpless. Rather, it is the relationship between LESS and help or harm that is different, insofar as help or harm are not in actuality interpreted as semantic arguments of LESS. And so, while LESS retains its semantics, by assumption LACKING, and while it retains its syntactic category as well as its categorial selection properties, there is clearly no necessary convergence here between the semantic argument and the syntactic one. When we consider, in comparison, the properties of S-functors, the difference becomes clear. For S-functors, a semantic transitive function is always in place, the categorial nature of the argument is directly derived from that semantic function, and the result is unfailingly compositional.\(^\text{17}\)

\(^{17}\) We note that the affix-less cannot be trivially combined with the degree modifier less, as the latter does not mean LACKING, but rather LESS. We further note that while a compounding analysis for e.g. airless may appear tempting, English does not have a productive rule of N+A compounding, nor is it obvious that less, in its independent occurrence, is a case of A, given the fact that less may modify both nouns and adjectives. The result, note, is always fully compositional:

(i) less air; less unhappy; less harm; less help
Consider now ING\textsubscript{N[v]}, which, as I already noted in Chapter 4, and as shall be discussed in some detail in Chapter 12, has its own semantics, specifically involving HOMOGENEITY (common to all non-gerundive instantiations of ING) and an incorporated ER-like pronominal clitic with an Originator entailment. While ample reasoning was provided for the need for ING to select a V in order for an AS-nominal to emerge, in R-nominals the fact that the CCS of ING must be V clearly does not follow from its semantics. Specifically, the (simple) event reading typically associated with ING\textsubscript{N[v]} R-nominals does not emerge from the verbal CCS of ING\textsubscript{N[v]}, but rather from ING\textsubscript{N[v]} itself. Nor does a simple event interpretation require V, as is clear from underived nouns such as \textit{class, lesson, party}, etc. Therefore if ING\textsubscript{N[v]}, when heading an R-nominal, must nonetheless select V as its CCS, this cannot possibly follow from its semantics, as it is hard to see why such a simple event reading could not emerge in conjunction with either N or A (e.g. *crueling or *Englishing, with a reading of engaging in cruelty or engaging in making or becoming English).\textsuperscript{18}

Returning now to the table in (21), we note that, formally, properties (b) and (d) are a single property within a BPS system (but not in an $X'$-theoretical model), and that (23) must hold:

\begin{equation}
\text{X projects } \iff \text{X has a complement}
\end{equation}

In turn, and insofar as so many C-functors do not have a semantic function altogether, and insofar as even when they do, their CCS cannot be reduced to such a semantic function and must be independently listed, it emerges that the basic property of C-functors is not their obligatory $X^{\text{min}}$ nature, but rather the obligatory existence of a CCS, leading in turn to an obligatory transitivity and hence to an obligatory projection. We note that here, too, the logic is endocentric, insofar as it is the listed properties of C-functors that guide their syntactic instantiation.

(24) provides some concrete illustrations of the properties of C-functors, taking as our starting point the C-functors ING and ATK (-\textit{ation}+\textit{kin}) and supplementing them with the properties of the C-functors LESS and AL, both of category A (and see Chapter 12, section 5 for a more detailed discussion of the semantic properties of ING\textsubscript{N[v]}):

\begin{enumerate}
\item a. a new translation; an official certification; gratification theory; customer satisfaction
\item b. satisfied customer; interesting book; unbearable consequences; derivative research
\end{enumerate}

\textsuperscript{18} Within a narrower domain, Alexiadou (2009) makes an explicit argument to the contrary, suggesting that insofar as -\textit{ing} nominals, even when not AS-nominals, denote an event, they must incorporate a verbal constituent. In turn, of course, the claim appeals to the assumption that the choice of C labels is inherently associated with meaning, and hence an event is always, in some sense, V. The view, we note, harks back to an attempt to derive syntactic properties from lexical semantics, and is rejected as such in Borer (2005b) as well as here, where it is assumed explicitly that event interpretation is a property of functional nodes, and not of lexical categories as such.

The text discussion notes that V is not necessary for a (simple) event reading to emerge. We note, by way of supplementing that argument, that the presence of V is not sufficient to give rise to an event either. If V, as such, entailed an event interpretation, it is not clear where such an event reading could have possibly vanished to in so many cases of verbal derivatives which lack it, some listed in (i) (many, note, clearly not root-based and reasonably compositional):

\begin{enumerate}
\item a. a new translation; an official certification; gratification theory; customer satisfaction
\item b. satisfied customer; interesting book; unbearable consequences; derivative research
\end{enumerate}
The picture of C-functors, as per the list in (21) and the illustrations in (24), is very much the classical one, with the caveat that it is syntactic, rather than morphology-specific. According to it, and as emerging from a tradition championed by Lieber (1980), Selkirk (1982), and Williams (1981a, b), English derivational suffixes are heads with a categorial specification which in turn select a categorial complement of some fixed type, resulting in the obligatory formation of a (binary) branching structure and projection. In line with Lieber (1980) we may take the latter to be their core property, making them, by definition, always syntactically transitive, thus accounting for their obligatory projection.

While the properties of C-functors thus described hark back to structural morphological accounts prevalent in the 1980s, it nonetheless remains the case that those approaches were firmly committed to the existence of fully specified entries for underived words, complete with category and C-selection (or its equivalents) of their own, where applicable. Within such approaches, if ATION is an affix of type N which selects a base of type V, the fact that ATION attaches to globalize, a derived verb, as well as to form, otherwise presumably underived, is of no particular interest. By assumption, form is a listed verbal entry, and thus serves as an appropriate base for ATION affixation. Slightly more complicated are cases such as nation. Here, the base, <nat>, never occurs on its own, and its category is not self-evident, to say the least. In such cases, and frequently appealing to Aronoff’s (1976) distinction between productive and analytic morphology, the assumption, typically, is that <nat> is effectively analyzed as a verb in the construction it appears in, although it is not, in itself, an independent entry (I return to the status of <nat> and similar unattested bases in Chapter 9, section 1).

From syntactic root-based perspectives, however, some aspects of the table in (21) appear rather controversial. Before we turn to discussing them, however, let us take a brief pause and clarify some rather fundamental assumptions made here and in the rest of this book concerning categories and what they stand for.

Perhaps the clearest case in which a controversy may emerge concerns (21b), according to which C-functors do come with a specific categorial selection frame but not so S-functors. This claim as well is not new. Thus, for instance, Lieber (1980) suggests that an affix such as ATION has both a category and a subcategorization frame, but not so inflectional suffixes (in her system) which are certainly deprived of a category and possibly of subcategorization as well. Nonetheless, the claim faces two rather diametrically opposed challenges. The first challenge is not to the proposed properties of C-functors as such but rather to the claim that they are distinct from those of S-functors. According to such a challenge, and in line with much traditional

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<table>
<thead>
<tr>
<th></th>
<th>ATK(_N[v]_A)</th>
<th>ING(_N[v]_A)</th>
<th>LESS(_A[N]_N)</th>
<th>AL(_A[N]_N)</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. Category</td>
<td>N</td>
<td>N</td>
<td>A</td>
<td>A</td>
</tr>
<tr>
<td>b. Semantic function</td>
<td>none</td>
<td>HOMOGENEOUS+ER</td>
<td>LACKING</td>
<td>none</td>
</tr>
<tr>
<td>c. CCS</td>
<td>V</td>
<td>V</td>
<td>N</td>
<td>N</td>
</tr>
</tbody>
</table>

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19 See Chapter 7, section 5, for some comments on the homophony of C-functors (e.g. AL\(_A\) and AL\(_N\) ).
wisdom, functional heads do exercise categorial selection: Comp selects T, T selects g-asp and so on. Even more importantly, insofar as we can say that a root such as e.g. √\text{FORM} is rendered V-equivalent in the context of C_{N[V]} as in (25a) as well as in the context of an Extended Projection as in (25b), what grounds are there for postulating such a radical distinction between S-functors and C-functors?

(25) a. [C_{N[V]} ]_{c=v} \pi_{\sqrt{\text{FORM}}} [ ]
   
   b. [\langle e \rangle_{T} ] \triangleright_{\text{ASP}} \ldots [c=v \pi_{\sqrt{\text{FORM}}}] [ ]

As the reader may recall, I suggested, instead, that the order of nodes within Extended Projections is universally fixed. Furthermore, in the system put forth here, note, S-functors, as such, could not have syntactic selection properties or a CCS for the simple reason that they are semantic operators which do not project and hence could not select. Nonetheless, one could claim that their semantic force, individually or collectively, determines the order of ExP-segments, or for that matter the fact that the C-core associated, e.g., with the derivation in (25b) is specifically V. Insofar as all these issues concern a further understanding of Extended Projections and their relationship with S-functors, I will return to them in section 6.3 in the context of a more thorough discussion of Extended Projections.

A diametrically opposed challenge, however, consists of the claim that (21b) is altogether wrong for C-functors. In other words, it would consist of the claim that no categorial selection is in evidence for C-functors. Indeed, the traditional claim that affixes select categorial complements (or lexical classes) has come under considerable criticism in recent years, in the wake of the suggestion, originally in Fabb (1988), that restrictions on the distribution of derivational suffixes are best captured as selectional restrictions individually specified either on stems/roots (e.g. govern selects -ment) or on other suffixes (e.g. IZE selects ATION). Differently put, ATION does not select V. Indeed, it is not clear that there is a functor that we may name ATION (or ATK, of which /\text{ation}/ is a particular instantiation). Rather, /\text{ation}/ is the spellout of a nominal form in the context of individually listed items, two of which happen to be transport and ize.

Suppose we attempt to cast this claim within a root-based system, where listed items are category-less, undervived roots. From the perspective of root-based systems, the important dividing line is between items that can, plausibly, be called “roots”, such as \sqrt{\text{FORM}} or maybe \sqrt{\text{NAT}}, on the one side, and items that are clearly constituents with some internal hierarchical structure, such as globalize or compositional, on the other. Insofar as I claim here that, e.g. /\text{ation}/ is one possible instantiation of a C-functor, call it ATK, which projects N and selects V, globalization is not problematic if it is assumed that /\text{ize}/ is a spellout of a functor which projects V. How does V-ness come to be associated with \sqrt{\text{FORM}} or maybe \sqrt{\text{NAT}}, however, so as to give rise to formation or nation? Even more fundamentally, is V-ness even a useful notion here, or would it be more useful to claim that ATK, and by extension C-functors in general, may attach to uncategorized roots, as well as to, e.g. -ize? This, effectively, is the account put forward, most succinctly, in Embick (2010) (although see Marantz 1997 as well as subsequent work for the original claim). Within
Distributed Morphology, in fact, it is explicitly assumed that functors (roughly, abstract morphemes spelled out by Vocabulary Insertion) may attach to either categorized structures or to roots. To illustrate, the morpheme PST projects syntactically (cf. Halle and Marantz 1993), and selects V (or v, or some other member of the verbal Extended Projection). In fact, it is specifically barred from attaching to a root. On the other hand, a morpheme (spellout) such as /-ation/ does not select V, nor does it need to have a verbal complement at all, and it may, possibly must, attach directly to a root.20 Thus Marantz (1997), as well as Embick (2010), i.a., explicitly claim that ATK (-ation+kin) never occurs in the context of V. Rather, given structures such as (26a) or (26b), the root remains altogether devoid of category, and a categorial function n in such configurations may be phonologically realized (at the level of Vocabulary Insertion) as /nation/, /nall/, /nment/, /nance/ and so on (as well as /nO/), as depicted in (26c). This, however, is not the case for all instantiations of n, and specifically, the n in (27) attaches to v. In such cases, however, it may only spell out as /ving/.

For Harley (2009a, b), the availability of uncategorized roots in the syntactic structure is even further extended to allow their full projection with their selected internal argument realized as a fully projecting DP, embedded within a root phrase, and giving rise to the systematic availability of the structures in (28a) for verbs, and (28b), by extension, for derived nominals (see also Embick 2004; see footnote 14 for notation):21

20 It thus appears that the formal systems here, much as both are root-based, nonetheless diverge rather radically. However, when it comes, specifically, to the categorial selection properties of S-functors, the divergence is rather less radical than it appears. While S-functors do not exhibit categorial selection as such, the Extended Projection as a whole does, a matter I return to in section 6.3.

A bigger difference emerges when we consider the fact that, by assumption, in Distributed Morphology a verb or a noun are at least binary branching, involving, at the very least, a root and a categorial node. It thus emerges that in that system PST may only attach to complex structures. I return to the consequences of this execution in Chapter 7.

21 (28b) is a conjecture based on the structure of verbal constituents in Harley (2009a) and the structure proposed for Synthetic Compounds such as truck driving and truck driver in Harley (2009b).
Both executions run into some difficulty when encountering the fact that ATK may realize \( n \) in the context of derived verbs, such as \textit{personify}, \textit{globalize}, and \textit{encase}. The matter goes largely undiscussed, short of the occasional suggestion (cf. Embick 2010) that—in line with Fabb (1988), Raffelsiepen (1992), and Plag (1999)—affix sequences exhibit selectional or possibly phonological restrictions (yet again at Vocabulary Insertion), mirroring, in essence, those which are attested in the relationship between roots and suffixes. Thus \( /\text{ation}/ \) does not specify \( V \) in its insertion frame, but rather \( /\text{ize}/, /\text{ify}/, \) and \( /\text{ate}/ \) (or alternatively \( \text{IZE}, \text{IFY}, \text{ATE} \)), or alternatively, \( n \) is realized as \( /\text{ation}/ \) in the context of \( /\text{ize}/, /\text{ify}/, \) and \( /\text{ate}/ \). From this point of view, the fact that \( /\text{ation}/ \) rather than \( /\text{O}/ \) or \( /\text{ance}/ \) occurs in the context of derived verbs is just as arbitrary as the fact that, e.g., \( /\text{ment}/ \) is inserted in the context of \( \sqrt{\text{GOVERN}} \) and not in the context of \( \sqrt{\text{SIST}} \), while \( /\text{ence}/ \) exhibits the opposite properties. The relevant insertion frame for the vocabulary item \( /\text{ation}/ \) would thus be, effectively, as in (29). We note, specifically, that at no point is it specified that \( /\text{ation}/ \) attaches to a \( V \) (or \( v \)). Rather, at all points it is maintained that the insertion frame for, e.g., \( /\text{ation}/ \) consists of a list of locally available strings, presumably phonologically specified:

\[
(29) \quad n \rightarrow /\text{ation}/\sqrt{\text{FORM}}\ldots; \sqrt{[\text{con}][\sqrt{\text{STRUCT}}]\ldots};[\ldots]/\text{ize}/\ldots;[\ldots]/\text{ify}/\ldots;[\ldots]-/\text{ate}/\ldots;
\]

There are, in turn, a number of serious conceptual and empirical reasons to reject (29) or any execution which denies a specifically categorial environment for the spellout of \( /\text{ation}/ \), and by extension, any C-functor, as I will now proceed to show.
6.2.3 C-functors—distribution

The most glaring disadvantage of (29) and similar claims (notably Plag 1999) is the fact that it fails, systematically and in a principled way, to capture the traditional, and yet self-evidently correct fact that e.g. -ation, conservatively put, never attaches to non-verbs. That all the suffixes to which -ation happens to attach give rise to verbs, from the point of view of (29), is a coincidence. Specifically, that -ize and -ate are members of the list, but not, say, -ive or -al, indeed has exactly the same theoretical status as the fact that transmits a possible insertion frame for both /ətʃən/ and /əl/, but, e.g., ad<sub>2</sub> are present in the /ən/ list but missing from the /ətʃən/ list. That -ment attaches to the prefixal verbalized forms de-, be-, and en-, but not to any non-verbal categorizers is yet another coincidence.

These coincidences are not restricted to the ATK<sub>n[v]</sub> class of affixes. Rather, they plague systematically all cases in which a categorial affix shows the diagnostics associated by Embick and Marantz (2008) with “root attachment”. Thus consider -ity. Within the system outlined in e.g. Embick and Marantz (2008) or Embick (2010), /iʃt/ must be allowed in conjunction with uncategorized roots (i.e. spells out an in the context of uncategorized roots), so as to accommodate cases such as annuity or heredity. In turn, it is presumably /iʃ/ which, like /iʃ/, spells out the attachment of in the context of categorized adjectives (i.e. a).<sup>22</sup> If that is the case, however, then we must, likewise, ask why it is that /iʃ/ never occurs in conjunction with any suffix which is not in itself A. The situation is particularly egregious as /iʃ/ is a very versatile affix, which may attach to six suffixes: -ic, -ous, -al, -an, -able, and -ive. Within a system that reduces the co-occurrence of suffixes to local correlations, as in (29), the fact that all six suffixes give rise to an adjective is a coincidence. And the list grows longer. -al (in its adjectival instantiation) must be allowed to attach to roots, so as to give rise to local or focal, which makes its attachment to /iʃ/ or /iʃ/, /iʃ/y, and /iʃ/ all nominal categorizers, but not to /iʃ/ or /iʃ/ a coincidence. In fact, and by way of a generalization, just about all stress-shifting categorizing suffixes in English must be allowed to attach to roots, and hence, by this rationale, all stress-shifting categorizing affixes in English do not (need to) specify a Categorial Complement Space. To the extent that any of them may attach to complex derivatives, this becomes a matter that can be solely captured by listing the affixes involved. That for any given affix, those environment affixes, when possible, are categorially identical across the board, is a coincidence.<sup>23</sup>

---

<sup>22</sup> By assumption, and following Arad (2003), non-compositional Content in Distributed Morphology is restricted to the domain of the root and its first categorizer. Thus insofar as annuity and heredity are non-compositional, /iʃ/ by assumption, spells out root attachment here, rather than attachment to a. The logic, at least to some extent, tallies that of Lexical Phonology and Morphology, as developed in Kiparsky (1982a, b) and subsequent work, where non stress-shifting English suffixes (so-called Level II affixes) are typically assumed to attach to words (i.e. categorized roots), but not so stress-shifting suffixes (so-called Level I affixes). For a more detailed discussion of some of these matters, see Chapter 9.

<sup>23</sup> Aronoff (1994) argues that adjectival -al only attaches to non-compositional cases of -ment, i.e. cases where -ment does not merge with a (recognizable) instance of V, or alternatively, where the result is non-compositional. The claim is specifically based on the non-availability of e.g. *employmental or *empower-mental. Counter-examples are, however, attested, as Aronoff notes himself:

(i) judgmental, governmental, argumental

(cont.)
A further illustration of the problem is available from the well-known prefixed paradigm in (30), involving forms which, by hypothesis, have been incorporated into English as already complex, and where a particular set of prefixes (cf. the partial list in (30a)) attaches to a particular set of stems, arguably roots, but where the latter are no longer attested independently or with any coherent shared Content (cf. the partial list in (30b)), making them, in a sense, “bound roots” and the prefix+root combination a “compound root”. As it turns out, a great number of these compound roots (cf. the list in (30c)) cannot be instantiated as nouns (but see (30d) for some clear exceptions).24

(30) a. con; de; e; ex; in; ob; re; pre/per; sub; trans
   b. π-FER; π-FORM; π-GEST; π-JECT; π-MIT; π-STRUCT; π-ceive . . .
   c. *the {confer; prefer; infer; ingest; suggest; eject; commit; remit; transmit; instruct; obstruct; destruct/destroy; arrive; derive; deceive/decept; receive/recept; perceive . . .}
   d. the {construct; transfer; digest; object; subject; réject; transfer; permit; extract; concept; percept . . .}

Focusing on the larger class, that is which is distributionally exclusively verbal, we note that there is no simple way to capitalize on this categorical generalization if nominal insertion is as in (29). Specifically, what emerges is that the forms in (30c) systematically cluster, when it comes to the selection of categorical suffixes, with -ize, -ify, and -ate. Thus consider ABLE_{A[v]} which, like ATK_{N[v]}, may attach to verbal suffixes:

(31) recognizable; globalizable; personifiable; identifiable; calibratable; instantiatable

In turn, ABLE can also attach to the forms in (30c). If, as seems reasonable, ABLE and ATK take a V Complement Space, the overlap between their insertion environment, both in terms of the affixes they attach to and in terms of the verbal forms in (30c), follows directly. If, on the other hand, the categorial selection of affixes goes unspecified, the substantial overlap between the insertion frames for ABLE and ATK becomes yet one more coincidence, and must be specified independently for each of these suffixes.

Finally, consider the attachment of -al, by assumption C_{A[N]} and -able, by assumption ABLE_{A[v]}, to the same set of stems, otherwise devoid of categorial marking, as in (32):

We note, in turn, that the overwhelming number of cases of -ment occur in the context of verbalizing prefixes (see, originally, Jespersen 1940/1961 as well as Emonds 1966), and that the exclusion of -al may be phonologically conditioned in such environments. For some illuminating discussion see Plag (1999).

24 If we accept the claim, originally due to Lieber (1980), that English prefixes do not have a category (BE{V}, EN{V}, and possibly DE{V} aside), and if we further accept the claim that the prefixes here are attaching to a category-less root, which likewise seems reasonable (e.g. as in (26b)) then the exclusively verbal nature of the forms in (30c) is intriguing, a matter I will leave aside in this work (but see section 6.4 for some tentative notes on prefixes). Note, in this context, that ν-PORT in its various prefixed instantiations allows considerably more nominal instantiations than most, to wit, export, import, support, report, and transport, and is also, arguably, considerably more Contentful as a bound or independent form. The correlation, likewise, is intriguing, but must await future research.
(32) a. formable; sortable; faceable; coastable; primable; palatable
   b. formal; sortal; facial; coastal; primal; palatal

Both -al and -able are instantiations of A, and all the forms in (32a–b) have reasonably transparent, compositional Content. Now if all forms in (32a–b) are instantiations of a attachment to a root, as seems at least possible, it would be rather hard to derive the fact that the Content compositionality of coastable feeds off, specifically, the standard Content of the otherwise verbal use of coast, while coastal refers to the Content of its otherwise nominal use. It would be difficult to account for the fact that primable is compositionally constructed from the Content of the verbal instantiation of prime, but primal from its nominal instantiation, and so on. If, however, -al and -able represent attachments to a categorized constituent, or more accurately, a constituent that is rendered equivalent to some category through its merger with a particular affix, the relevant Content could be straightforwardly constructed.

One could claim that in (32a–b), but not, say, in focal or capable, attachment is to a fully categorized form (e.g. with a zero-realized n or v categorizer). If that is the case, then something like the selection frames in (33) would need to be available, effectively amounting to a disjunction which allows ABLE or AL to merge not only with roots, but also with instances of categorized V/N. We note, yet again, that the list for ABLE here would need to contain not only a О instantiation of v but also -ize, -ify, and -ate, as well as the verbal prefixes en- and be- (but not, say, О_n), and similarly for ALА -ation, and -ment, but not, say, О_v or -ize:

(33) a. \textit{a} \rightarrow \textit{able}/ \{\sqrt{\text{FORM}}\_\_; \sqrt{\text{CAP}}\_\_; \sqrt{\text{PALAT}}\_\_; О_n\_\_; \text{ize} \_\_; \text{ify} \_\_; \ldots \}
   b. \textit{a} \rightarrow \textit{al}/ \{\sqrt{\text{FORM}}\_\_; \sqrt{\text{FOC}}\_\_; \sqrt{\text{GLOB}}\_\_; О_v\_\_; \text{ation} \_\_; \text{ure} \_\_; \ldots \}

(33), note, is a strange sort of set, insofar as the insertion of a vocabulary item within Distributed Morphology, be it -able or -al, may be conditioned on the one hand by a category-less root, and on the other hand by a labeled phonological representation associated with an already inserted vocabulary item. Note, in this respect, that at least in some cases a categorial label must be specified. Although -ify and -ize may as such license the merger of -able and block the merger of -al, О-affixes allow both -able and -al, and hence the distinction between the cases in (32a) and (32b) can only be captured if О is augmented with a categorial label, as in (33a–b), and if both -able and -al can avail themselves of such categorial information in their insertion environment.

(33) has a number of additional rather unfortunate consequences. Note, first, that insofar as both -able and -al can attach to roots, there is little reason—or method—to block them from freely merging with √FORM or √PRIME. It therefore emerges that we predict an identical structure for formal/formable and primal/primable under root attachment (i.e. (36a), (37a)), alongside a presumably distinct structure under
categorial attachment (i.e. (36b), (37b)). More importantly, and more generally, and especially in conjunction with the existence of $\emptyset$-realized categorial affixation, it means that derivatives such as *formal*, *primable*, *formation*, or *transmission* are systematically and across the board potentially structurally ambiguous between a structure that involves merger with a categorially unspecified root, giving rise to two morphemes, and a merger with a categorially specified branching constituent, thereby involving three morphemes, the latter on a par with that associated with, e.g., *realization*. And yet it is not clear that the existence of such systematic structural ambiguity could be verified or falsified in any way:

Within the particular approach to non-compositionality developed in Arad (2003) (and see also Marvin 2002; Embick and Marantz 2008; Embick 2010), a prediction is actually made concerning the potential structural difference between a direct merger with a root (as in the (a) variants of (34)–(37)) vs. a merger with a categorized structure (as in the (b) and (c) variants of (34)–(37)), in that the former, but not the latter, can (but need not) give rise to non-compositionality. Insofar as e.g. both *formal* and *transmission* are ambiguous between a compositional and a non-compositional Content, the claim would attribute the non-compositional
Content to the (a) variants. We note now that insofar as root merger may give rise to compositional Content, we expect compositional cases in which e.g. formal and formable, coastal and coastable would be synonyms, under the structure in the (a) variants of (36a), (37a). We also note that in the absence of any independent tests for the relative structural complexity under consideration, the claim that only root attachment may give rise to non-compositionality rather boils down to the claim that, by definition, any case of non-compositionality consists of root attachment, and where what is or is not a root is therefore defined exclusively in terms of these theory-internal considerations.25

6.2.4 C-functors and AS-nominals

By way of sharpening the distributional argument for categorical selection for C-functors outlined in (21), consider again derived nominals, as discussed extensively in Part I. Following, rather conservatively, the conclusions already reached in the present chapter, suppose we take the term “de-verbal nominalizer” to refer to a C-functor which may merge with derived verbs, and which may also merge with roots (including compound roots with an exclusively verbal distribution, cf. (30)), but which is absolutely barred from merging with any (categorized) non-V element (e.g. it may not attach to -ive, -ous, -ic, -al, -able, -age, and so on), or with any other constituent which may appear underived but which has an unambiguous distribution which is incompatible with V (e.g. long).26 We now note that in English, AS-nominals always contain a discernible constituent which corresponds to an attested verb (and likewise, S-nominals, in the sense of Roy 2009, always contain a constituent which corresponds to a discernible attested adjective). Nor is English

25 This, in fact, is the exact route followed in Embick and Marantz (2008), where what is or is not a root seems to be defined exclusively through the presumed properties of the emerging derivative (see also Marvin 2002). To illustrate, in attempting to account for the (possible) ungrammaticality of *gloriousity (cf. Aronoff 1994) Embick and Marantz suggest that -ity cannot merge with -ous (i.e. cannot be inserted as n which merges with a that spells as ous). Insofar as e.g. curiosity is licit, however, this forces them to the conclusion that in curious, -ous is not a true suffix, and rather, there exists a root, \( \sqrt{\text{CURIOUS}} \), to which -ity here attaches. The generalization they miss is akin, but nonetheless distinct from, the one which is missed, I believe, by (29). (29), as per the text discussion, fails to capture the systematic categorial nature of affixal insertion frames. The suggestion that, e.g., curious is a root fails to take count of the fact that “roots” that end with -ous, and with very few exceptions, can only occur as adjectives and only allow the affixation possibilities attested with adjectives (e.g. -ness, un-). The problem, again, is a general one. If \( \sqrt{\text{CURIOUS}} \) (but only as A) then why not \( \sqrt{\text{REVIVITY}} \) (but only as N), \( \sqrt{\text{NATION}} \) (but only as N), \( \sqrt{\text{FOCAL}} \) (but only as A), \( \sqrt{\text{POSSIBLE}} \) (but only as A), etc.? Why, indeed, direct attachment to bare roots ever, as opposed to exclusive attachment to already categorized roots, i.e. listed categorized forms which have non-compositional Content such as nation, focal, possible, etc.?

A claim concerning distinct phonological effects of roots vs. categorial merger is made in Marvin (2002), as well as in Embick (2010)). I return to a fuller review of these matters in Chapter 9, and here only note that the phonological effects under consideration are not restricted to root attachments but are associated with + boundaries in more complex structures as well. In Chapter 7 I return to a fuller discussion of categorial zero affixes.

26 As I will suggest in Chapter 7, section 6, English adjectives, including short, long, fat, white, etc. (and possibly adjectives universally) must be considered complex and hence categorized. This, we note, contradicts, at least on the morpho-phonological level, the assumption that A is the most basic category, advanced in Baker (2003).
unique in this respect. In a broad range of languages which display the relevant typology, there simply exist no cases of AS-nominals which do not have a corresponding phonologically attested verb (including, but not limited to, French, German, Dutch, Russian, Polish, Greek, Hebrew, and Arabic). In discussing the matter in Chapter 2, section 1, I already illustrated in some detail that when that is not the case, i.e. when nouns independently name an event, but are nonetheless not derived from phonologically attested verbs, they systematically lack the properties associated with Grimshaw’s complex events, or with the syntactic configurations I named AS-nominals. The minimal contrast in (38) and (39) illustrates this conclusion:\footnote{Although Grimshaw’s (1990) system does not involve the inheritance of properties from verbs, as already noted in Chapter 2, any system which does derive complex nominals from verbs, lexicalist or otherwise, is capable of introducing whatever adjustments would be necessary, in principle, to force inheritance from verbs in AS-nominals, and thereby mandate their presence in these contexts (and see Chapter 9, section 1.1 for some further relevant issues and a review). It thus emerges that the problem identified here is not a lexicalist one as such. Rather, and as per the text discussion, it affects directly systems in which it is assumed that category-less roots may have arguments of their own, and that arguments may therefore be instantiated in structures which never contain a V constituent, and thus Chomsky’s (1970) original execution, in turn adopted in Marantz (1997) (and see also Ouhalla 1991 and Picallo 1991), as well as subsequent modified versions of Marantz’s work and that of Embick (2010) and Harley (2009a, b).}

(38) a. The \{class/lesson/course/seminar\} took place at sunset and lasted 90 minutes.  
b. The \{class/lesson/course/seminar\} (*to/of the student)(*by the teacher) (*to explain the exam) (*in/for 90 minutes)

(39) a. The \{instruction/ supervision/maintenance\} took place at sunset and lasted 90 minutes.  
b. The \{instruction/supervision/maintenance\} (of the student)(by the teacher) (to explain the exam) (in/for 90 minutes)

In turn, and assuming that the description here is on the right track, the generalization, such that it excludes the nouns in (38) from heading an AS-nominal, but not the nouns in (39), absolutely cannot be captured if we assume, as in Marantz (1997 and subsequent work) as well as in Harley (2009a, b) and Embick (2010), that ATK functors may attach directly to an uncategorized root (or, within Distributed Morphology, that -ation is only licit as a realization of \(n\) when it attaches to roots). In Distributed Morphology, not only instruction, but also class (with \(n\) realized as zero) is a case of direct merger of \(n\) with an uncategorized root. Such direct merger would further characterize, presumably, brevity, concert, and culture, none of which can function as AS-nominals. Of course, none of these nominalized constituents has a phonologically realizable verb within them, but with direct merger of \(n\) with an uncategorized root, this generalization cannot possibly be formalized:

\[
\begin{array}{c}
\text{n} \\
/\pi \text{maintenance}/ \\
/\pi \text{maintenance}/ \\
\end{array}
\]

\[
\begin{array}{c}
\text{n} \\
/\pi \text{class}/ \\
/\pi \text{class}/ \\
\end{array}
\]

\[
\begin{array}{c}
\text{n} \\
/\pi \text{brevity}/ \\
/\pi \text{brevity}/ \\
\end{array}
\]
It might be worthwhile noting that attributing the event properties to the nominalizer, as in Grimshaw (1990), would fail as well, insofar as ATK nominals, with any realization, are directly barred from being AS-nominals when there is no discernible V embedded within them (e.g. nation, convenience, environment), even when they plausibly do refer to a (simple) event, as (41) illustrates:

(41)  
(a) *the vision of the mountain by the instructors for three hours this morning  
(b) *the aviation of the plane for three hours by the novice pilot

Here as well, a disjunction-based account as in (33) creates more problems than it solves. Concretely, suppose ATK attaches either to verbs or to roots, and AS-nominals are only licit in the presence of the former attachment. However, instruction, supervision, and maintenance are possible as R-nominals, as their occurrence without event structure in (39a) indicates. If these are cases of affiliation to V, then this leaves, as attachment to uncategorized roots, only cases in which ATK merges with bases which are otherwise non-licit words in English altogether, such as nation or convenience. Within a root-based system, this is an awkward generalization, as it serves to fundamentally weaken the usefulness of the notion “root” altogether. Alternatively, it could be claimed that instruction and maintenance are structurally ambiguous, with one derivation involving root attachment (\([\sqrt{\text{MAINTAIN}}\text{-ATK}_{\text{ance}}]\)) and the other an attachment to a zero-derived verb (\([\sqrt{\text{MAINTAIN}}\text{-v}_{\text{C31}}\text{-ATK}_{\text{ance}}]\)). As already noted, however, in the absence of independent structural tests, such systematic structural ambiguity is non-falsifiable. Finally, note, insofar as e.g. -ance never attaches to (overtly) derived verbs—a point noted already in Fabb (1988) and discussed rather extensively in section 6.2.5 below—it is altogether not clear how the AS-nominal instantiation of e.g. maintenance could be derived without postulating that -ance does not attach to overtly derived verbs, but does attach to zero-derived ones; likewise a rather awkward generalization.28

None of these problems emerges if we assume that ATK is a C-functor which projects N and has V as its CCS (i.e. it is \(C_{\text{N[V]}}\)). The absence of an AS-nominal reading for (38b) would reduce directly to the fact that there is no V embedded within them. In turn, the distinction between the AS-nominal instantiation of, e.g., maintenance and instruction, and their R-nominal instantiation would not emerge from the presence vs. absence of V, but rather from the presence or absence of syntactic event structure.

---

28 Marantz (2010) following Embick (2004, 2010), in attempting to address specifically this problem while still maintaining that derived nominals such as rotation are derived from a non-categorized root, suggests that some roots are inherently eventive, and that these roots would be those which would have an event structure instantiation, in both the verbal and nominal extension. We note that quite apart from the fact that this claim amounts to endowing roots with both syntax and semantics, it faces serious problems when faced with the strict correlation between argument structure and a syntactically plausible verbal constituent vs. the absence of both, even for roots which are, by assumption, eventive (or resultative). Form, as in a rigid form, does not have any event properties, and neither does formal, although, by assumption, the existence of an AS-nominal headed by formation presupposes that \(\sqrt{\text{FORM}}\) is eventive. I return to this matter briefly in Chapter 9, section 1.2.
The discussion thus far, we note, does leave unaddressed the ungrammaticality of (41a–b). Specifically, if ATK selects V, then by assumption, there is a V constituent in *vision, aviation, or environment*, although not otherwise phonologically attested. But if such a V is present, why are AS-nominals nonetheless impossible? Specifically, how can the system capture the fact that while the CCS of ATK is always V, phonologically attested instances of V are somehow privileged, when it comes to AS-nominals? I return to this matter in Chapters 9 and 10, where the specific relationship between phonological realization and structure is addressed in considerable detail. See also section 6.3 below for a brief relevant note.

6.2.5 C-functors: locality

Consider now the specific phonological instantiation of C-functors in the context of specific stems. Uncontroversially, non-suffixed stems, presumably roots (including compound roots) may select the specific instantiation of affixes attached to them. Specifically, and continuing to assume that ATK is a C_N[V] functor with multiple phonological realizations, consider the table in (42), a partial set of the compound roots already discussed briefly above and their nominalization possibilities:29

<table>
<thead>
<tr>
<th>Root</th>
<th>/-ation/</th>
<th>/-ence/</th>
<th>/-ment/</th>
<th>/-al/</th>
</tr>
</thead>
<tbody>
<tr>
<td>_JECT</td>
<td>ob-ject-ion</td>
<td>XXX</td>
<td>e-ject-ment</td>
<td>XXX</td>
</tr>
<tr>
<td></td>
<td>e-ject-ion</td>
<td></td>
<td>pro-ject-ion</td>
<td></td>
</tr>
<tr>
<td></td>
<td>re- ject-ion</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>_MIT</td>
<td>trans-mit-ion</td>
<td>trans-mit-ance</td>
<td>com-mit-ment</td>
<td>trans-mit-al</td>
</tr>
<tr>
<td>_FER</td>
<td>XXX</td>
<td>trans-fer-ence</td>
<td>de-fer-ment</td>
<td>trans-fer-al</td>
</tr>
<tr>
<td>_PORT</td>
<td>trans-port-ation</td>
<td>XXX</td>
<td>com-port-ment</td>
<td>trans-port-al</td>
</tr>
<tr>
<td>_SIST</td>
<td>XXX</td>
<td>per-sist-ence</td>
<td>re-sist-ance</td>
<td>XXX</td>
</tr>
<tr>
<td></td>
<td></td>
<td>as-sist-ance</td>
<td>de-sist-ance</td>
<td>XXX</td>
</tr>
<tr>
<td>_CEIVE</td>
<td>de-cept-ion</td>
<td>ac-cept-ance</td>
<td>XXX</td>
<td>XXX</td>
</tr>
<tr>
<td>_RIVE</td>
<td>de-rive-ation</td>
<td>ar-rive-ance</td>
<td>ar-rive-ment</td>
<td>ar-rive-al</td>
</tr>
<tr>
<td>_GEST</td>
<td>sub-gest-ion</td>
<td>XXX</td>
<td>sub-gest-ment</td>
<td>XXX</td>
</tr>
<tr>
<td></td>
<td>con-gest-ion</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>di-gest-ion</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

29 The reader is referred to the appendix for a general discussion of the methodology of data collection and of “esoteric” words.

30 Note that importance (=being important) is not a verbal derivative.
That more than one nominalizer does, indeed, occur for the same prefix–root combination, and with the same interpretation (register and jargon notwithstanding), should be clear from the following cases, some based on Google searches and all chosen with the construction of minimal pairs in mind:

(43) a. following the ejection of the tenants themselves . . .
   b. manner of ejectment of residential tenants (NC Legal article)

(44) a. the selective transmission of historical documents
   b. scanning and transmittal of documents or parts of documents (US Patent office publication)
   c. a camera system for processing documents for measurement of reflectance and/or transmittance of . . .

(45) a. deferment of student loans
    b. The department shall grant a deferral of interest and principal payments.

(46) a. Several groups . . . monitor the sale and transportation of seed.
    b. “The transportal of seeds in the wool or fur of quadrupeds.” (article by C. Darwin)

(47) a. the slight transference of red pigments from the skins
    b. “transferal of bread ‘sponge’ from dough mixer to trough prior to fermentation” (Encyclopedia Britannica)

The compound roots in (42) and their nominalizers make for a particularly clear exemplification of the nature of the relationship between the root and the choice of C-functors precisely because it is patently obvious that the choice is entirely arbitrary. There appears to be no semantic generalization that runs across all occurrences of a particular suffix (e.g. -ance or -ation), and quite frequently, the very same compound root occurs with more than one suffix, and with an identical meaning (transmission; transmittance; transmittal). Even when nuances of Content are present, they are typically more indicative of jargon and register specialization (e.g. ejection and ejectment) than of real fundamental semantic difference. Finally, when genuine Content differences do exist, the pairing of Content with a particular instantiation of ATK is arbitrary. It is not obvious, for instance, why it is deportment that comes to be associated with the (presumably non-compositional) Content of ‘behavior’, rather than the fully compositional deportation and not the other way around (and see Chapter 9 for additional discussion of such pairs).31

31 Marchand (1969) suggests that de-verbal -ance/-ence attaches to verbs of duration (maintenance, adherence, persistence), while -al attaches to verbs with a direction and an end point (acquittal, disposal, arrival). As he himself notes, however, pairs such as acquittal/acquittance, pursuance/pursual, abidance/abidal render this effect, if indeed present, a weak one at best. Note also that insofar as it is at times argued that -ment is a Level II suffix, and insofar as in deportation there is no stress shift, but there is one in deportation, the non-compositional Content of deportation vs. deportation shows that non-compositional-ality cannot be fully correlated with the availability, or lack thereof, of stress shift. For more on this and related issues, see Chapter 9.
Nor is there any generalization that cuts across specific bound roots to determine the choice of nominalizer. Thus transmit, transmittance, transmittal, but *transmitment, the latter contrasting with the occurrence of -ment with \( \pi \sqrt{mit} \) in commitment; deferral and referral, but deferment vs. *referment, and so on. One bound root, \( \pi \sqrt{sist} \), clearly only occurs with one suffix, (-encel-ance), but even this appears to be an arbitrary fact, as other bound roots come with more than one nominal realization, and at times, as in the case of \( \pi \sqrt{fer} \), and \( \pi \sqrt{mit} \), with all.

The inevitable conclusion, and the established one, is that the relationship between specific realizations of the C-functor we have been calling ATK and their conditioning environment is an individually listed one. The reason that commitment exists but committance does not is because it is so listed. The need for listedness, in turn, is not restricted to compound roots or to the ATK functor. \( \pi \sqrt{form} \) and \( \pi \sqrt{collect} \) occur with (-a)tion, \( \pi \sqrt{govern} \) and \( \pi \sqrt{move} \) occur with -ment; \( \pi \sqrt{utter} \) with -ance and so on. Nor is this restricted to the choice of nominalizers: \( \pi \sqrt{continue} \) occurs with both -ous and -al, with virtually the same meaning, but \( \pi \sqrt{form} \) with -al and not with ous. \( \pi \sqrt{amor} \) occurs with -ous, but not with -al, and \( \pi \sqrt{fluid} \) with -ic and -al, but not with -ous, and so on and so forth. In view of this, one doesn’t only come to question the potential scope of any attempt to derive specific root selection from the semantics of individual C-functors, but also the potential explanatory benefits of any attempt along such lines.

In line with what I believe to be uncontroversial, I will proceed to assume that the environment which determines the particular phonological realization of a given C-functor is local (insofar, of course, as such functors may have more than a single possible realization, as appears to be the case for ATK, but not, e.g., for ABLE). Specifically, and insofar as roots, including compound roots, appear to select the specific realization of their nominalization, I will assume that the relationship between the root and such nominalizers must be local. Suppose we assume, rather conservatively, that a (non-branching) A may impact the selection of C providing there is no intervening B such that it is itself non-branching and is “closer” to C: i.e. in the configuration in (48a) A may select C (or vice versa), but not so in the configuration in (48b), where A may select B and B and C may select each other, but A may not select C, nor can C select A:

\[
\text{(48) a. } \quad A \quad C \\
\text{b. } \quad A \quad B \quad C
\]

We may thus define locality, specifically as relevant within the domain of spellout, as in (49):\(^{32}\)

\[
\text{(49) A. For X, X a terminal, the phonological selection for X must be realized within the domain of X.}
\]

\(^{32}\) We note as an aside that the claim to be advanced in Chapter 10 that the root and the affix immediately attached to it constitute a phase would not change the definition of locality as such, only the particular way in which it is implemented.
B. Y is in the domain of X iff there is α such that α immediately dominates X and Y is contained in α, and there is no W such that W is a terminal and W is contained in α and Y is contained in the domain of W.

It thus follows that insofar as move, or govern, or utter, or, in turn, the compound roots in (42) select the realization of their nominalizer, we must conclude that their relationship with their nominalizer is local in the required sense, and that specifically, no terminals may separate such roots from the nominalizer. In the relevant sense, then, a root (as well as a compound root) would be A, and the relevant nominalizer C in (48a).

Consider now, from this perspective, the picture of English suffixes, and whatever relationship may hold between them. I already noted that in (29) and similar systems which postulate the phonological selection of suffixes by other suffixes, the relationship which is assumed to hold between, e.g., -ation and -ify or -ize is the very same one which holds between transfer and -ance, leading to a loss of the categorial generalization. We note as an aside that if it is -ize that selects -ation (rather than e.g. C\textsubscript{N[V]ation} selecting V\textsubscript{ize}), then the definition in (49) would in actuality need to be modified, so as to allow not only terminals to select, but their projection, as well. Specifically, and considering the structure in (50) with \( \pi\textsubscript{\text{PATRON}} \) its presumed root, we note that [patronize] is embedded within the constituent headed by -ation, and thus the only sense in which -ize can be said to select -ation would have to allow the phrase headed by -ize, “ize\textsuperscript{max}”, to exercise selection, presumably percolating from its head. What is entirely clear under any execution, nonetheless, is that there is no local relation between \( \pi\textsubscript{\text{PATRON}} \) and -ation:\textsuperscript{33}

\[
\begin{array}{c}
\text{[\( \pi\textsubscript{\text{PATRON}} \>-\text{ize} \)]} \\
\text{[\( \pi\textsubscript{\text{PATRON}} \>-\text{ize} \) -ation}
\end{array}
\]

Consider now the fact that for any set of multiple possible phonological realizations for an identical categorial pair (i.e. cases such as ATK, where the category of the C-functor is a constant, N, and so is the category of the complement space, V) and considering specifically C-functors without specific semantics (i.e. excluding ABLE, ING, or ER, as well as unique-realization affixes such as SHIP), there is always one phonological realization which asymmetrically attaches to (just about) all derivatives. Exactly one nominalizer which attaches to underived (forms otherwise occurring as) verbs also attaches to suffixal derived verbs: -ation. Exactly one nominalizer which attaches to underived (forms otherwise occurring as) verbs also attaches to prefixal

\textsuperscript{33} Alternatively, one could claim that phonological selection is only sensitive to adjacency. The move is empirically problematic at least for -ment, conditioned by non-adjacent prefixes. Furthermore, and as we shall see below, and insofar as it is empirically disadvantageous to allow -ize to exercise selection on the shape of its nominalizer, such a move is not only unwarranted, it would also serve to weaken any attempt to derive complex words syntactically, insofar as it would by necessity sever morpho-phonology from morpho-syntax in ways which cast serious doubt on the explanatory value of the latter (see Chapter 8, section 2 for some elaboration).
derived verbs: -ment. Exactly one verbalizer which attaches to underived (forms otherwise occurring in isolation as) adjectives attaches to derived adjectives: -ize. That very same verbalizer may also attach to both underived (distributional) nouns and to derived nouns. Exactly one adjectivizer which attaches to underived (distributional) nouns attaches to derived nouns: -al.\(^{34}\)

\[(51)\] V>N, suffixes:
\(a\). patron-ize-ation; qual-if(i(c))-ation; instant-iat-ion
\(b\). *patron-ize-al; *qual-if(i(c))-al; *instant-iat-al
\(c\). *patron-ize-ance/ence; *qual-if(i(c))-ance/ence; *instant-iat-ance/ence
\(d\). *patron-ize-ment; *qual-if-i-ment; *instant-iat-ment

\[(52)\] V>N, prefixes:
\(a\). en-case-ment; en-dear-ment; be-devil-ment; be-witch-ment; de-thron-ment; de-rail-ment
\(b\). *en-case-ation; *en-dear-ation; *be-devil-ation; *be-witch-ation; *de-thron-ation; *de-rail-ation
\(c\). *en-cas-ance; *en-dear-ance; *be-devil-ance; *be-witch-ance; *de-thron-ance; *de-rail-ance
\(d\). *en-cas-al; *en-dear-al; *be-devil-al; *be-witch-al; *de-thron-al; *de-rail-al

\[(53)\] A>V:
\(a\). form-al-ize; atel-ic-ize; sapi-ent-ize; sensi-tiv-ize; americ-an-ize
\(b\). *form-al-ify; *atel-ic-ify; *sapi-ent-ify; *sensi-tiv-ify; *ameri-can-ify
\(c\). *form-al-ate; *atel-ic-ate; *sapi-ent-ate; *sensi-tiv-ate; *ameri-can-ate
\(d\). *form-al-en; *atel-ic-en; *sapi-ent-en; *sensi-tiv-en; *ameri-can-en

\[(54)\] N>V:
\(a\). prior-it-ize; protest-ant-ize; argu-ment-ize
\(b\). *prior-it-ify; *protest-ant-ify; *argu-ment-ify
\(c\). *prior-it-ate; *protest-ant-ate; *argu-ment-ate
\(d\). *en-prior-ity; *en-protest-ant; *en-argu-ment
\(e\). *de-prior-ity; *de-protest-ant; *de-argu-ment

\(^{34}\) In a major endeavor, Plag (1999) attempts to derive all restrictions on the co-occurrence of affixes from phonological considerations (e.g. stress placement or restriction on syllable structure) and from a postulated lexical semantics for the affixes, and without appealing to any categorial generalizations. It goes without saying that there are phonological generalizations which narrow down the distribution of affixes, of which the ungrammaticality of the cases in (53d) would serve as a prime example. It might be also necessary to allow in a narrow range of cases for affixes to condition the realization of other affixes, with the selection of -ic by -ist, as in fn. 36 below, being potentially an illustrative case. What remains, entirely unexplained in Plag’s (1999) system however, is the correlation between phonological properties and categorial merger environment so as to conspire for the overwhelming dominance of a single default instantiation for each major category type, vs. local root attachment in other cases.
(55) N>A:
   a. judge-ment-al; combi-n-at-or-i-al; bapt-ism-al; profes-sor-ial; com-is-sion-al
   b. *judge-ment-ous; *comi-n-at-or-i-ous; *bapt-ism-ous; *professor-ous; *comi-sion-ous
   c. *judge-ment-ic; *comi-n-at-or-i-ic; *bapt-ism-ic; *professor-ic; *comi-sion-ic (but note licit bapt-ist-ic/*bapt-ist-al)

Descriptively, then, we have something along the lines of (56)–(58):  

(56) a. All realizations of ATK (as well as -ure and -age) attach to underived forms (including compound roots).
   b. Only -(a)tion attaches to right-headed (overtly) derived verbs.
   c. Only -ment attaches to left-headed verbs.

And see especially Fabb (1988) for many of these correlations. See also Plag (1999) for a critical review which, with few exceptions, substantiates Fabb’s empirical findings, although doesn’t endorse his theoretical approach.

(i) is the total sum of attested cases in English in which -ance/ence/ancy/ency/al/ment attach to verbal suffixes (generously construed), excluding -en:
   a. (re)cognition; munificence; magnificence; (in)significance
   b. i. advertisement; aggrandizement; amortizement; apprization; chastizement; oxygenizement
   ii. abatement; acclimatization; debatement; reinstatement

(ii) constitutes the exhaustive list of nominalizers other than -ment in the context of verbalizing prefixes. Note that all cases in (iiib) have a verbalizing suffix as well:
   a. awakenment; bedizement; disheartenment; enlightenment
   b. (listed in Plag 1999): fastenment (dialectal); chastenment (rare); lengthenment (rare); worsenment

Particularly interesting, in fact, is the contrast between the licit cases in (iiiia) and the illicit cases in (iv). While the verbal form with the suffix -en and without the prefix is licit, it cannot be nominalized with -ment, thereby corroborating the crucial role of the prefix as well as the plausible claim that the context here cannot be phonological in the absence of adjacency:

(iv) lighten hearten waken liven
   *lightenment *heartenment *wakenment *livenment

-ify and -en, as well as categorizing prefixes are virtually not attested with derived forms. The full list of cases in which -ate can be claimed to merge specifically with an -ive realization of C\[v\] are in (v):

(v) (de)activate; captivate; cultivate; titivate; (motivate; salivate)

Importantly, and contrary to Fabb (1988) denominal -ize does allow attachment to nominal suffixes (and see also Plag 1999):

(vi) C\[v\]-ize /\_er\_ /\_an\_ /\_ant\_ /\_ion\_ /\_y\_ 
    comput-er-ize; pedes-tri-an-ize; psychoph-ant-ize; miss-ion-ize; revolut-ion-ize; morpholog-(y)-ize

Finally, denominal -al occurs in considerably more environments than Fabb postulates, and at the very least in the following:

(vii) C\[v\]-al /\_ion\_ /\_ment\_ /\_or\_ /\_or\_y\_ /\_ar\_y\_ /\_ism\_ 
    operational; governmental; developmental; doctoral; electoral; editor-y-al; equat-or-y-al; advers-ar-y-al; commiss-ar-y-al; par-ent-al; conson-ant-al; embol-ism-al; enur-ism-al
(57)  a. All members of the -ize/-ify/-(i)ate triplet (as well as en- and be-) attach to underived forms.
   b. Only -ize attaches to (overtly) derived nouns and to (overtly) derived adjectives.

(58)  a. All members of the -all/-ic/-ous triplet attach to underived forms.
   b. With the exception of -ist, only -al attaches to (overtly) derived nouns.
   c. -ic attaches to -ist (and -al does not), but to no other (overtly) derived nouns.36

Importantly, if the descriptive picture outlined, broadly, by (56)–(58) is indeed a general one, then there must be a principled way to capture it. An affix-by-affix insertion environment, of the type in (29), in turn replicated, with the relevant suffixes, for -alA and -ize, but not for -ify and -ous, clearly fails to capture the core generalization here. Nor do the correlations correspond to stress-shift, the absence of the latter sometimes claimed to correspond to greater freedom. Differently put, the generalizations as stated in (56)–(58) are structural ones, insofar as they make reference to a complex, labeled structure. Not so insertion rules such as (29), the logic of which would predict, erroneously, no in-principle distinction between the insertion environment for derived and underived forms.

The distinct insertion environments for -ation and -ment serve to support this conclusion. One could, of course, simply list the three English verbalizing prefixes as requiring the insertion of -ment and barring the insertion of -ation, and similarly, list all three English verbalizing suffixes as requiring -ation. But the bottom line is that the generalization is clearly a structural one, and not an item-by-item one, all the more so because -ment is not string adjacent to the prefixes that require its presence and hence any reduction of phonological selection to mere adjacency is doomed to fail. Insofar as a distinction between a categorizing prefix and a categorizing suffix is fundamentally a syntactic one, it is clear that listing the insertion environments for -ation and for -ment item by item would be missing the point.

The generalization extends beyond C-functors, and replicates itself, after a fashion, in the spellout domain of S-functors. To see that this is the case, suppose we take as

36 That -ic(al) systematically attaches to -ist whereas -al attachment is entirely excluded remains an unresolved puzzle. With few exceptions (cataclysmic, baptismal), neither attaches to -ism: *fatalismic/ *fatalismah; *altruismic/*altruismah; *animalismic/*animalismah; etc. Similarly relevant is the question of whether in cases which exhibit a single affixal dependence on another, as in the case of -istic, there is a full justification for considering them two distinct affixes, all the more so as it is not always easy to tell what function, categorial or otherwise, is actually added by -ic in such cases (e.g. chomskyist analysis vs. chomskyistic analysis). Altogether, and as we shall see in Chapter 11, the English system differs here from the Semitic system, where a derivational template, a binyan, comes with fixed realizations that are clearly internally related in a fashion that cannot be established in English or other similar morphological systems. See Chapter 11, section 1.3 for some relevant comments on this issue.

I assume without further discussion that -logy as well as e.g. -ography are not suffixes but rather complex forms consisting of (bound) roots, p√graph and p√logic and a nominalizer, -y ([N[√log]-y]) and that hence, e.g., morpho-logy is a compound. In morphologic, then, the correct parse is morpho [[√log] ic] and not [morphology]ic.
our starting point the execution in Halle and Marantz (1993), roughly as in (59). More specifically, Halle and Marantz suggest that different realizations of PST are conditioned by the verbs to which they attach. Importantly, the competition between different realizations obeys a specific direction of application, with the particular preceding, and hence bleeding the general. In the absence of any conditioning, the default form occurs. The picture that emerges thus looks as in (59):

(59) PST $\rightarrow$ -Ø / sing, put, sit, eat ............
    PST $\rightarrow$ -t / spend, catch, buy ............
    PST $\rightarrow$ -ed / V

Several things are worth pointing out, specifically, for the Halle and Marantz system. First, the assumption is that alternations such as sing/sang, fall/fell, etc., are not, in and of themselves, past tense marking, but rather these are stem allomorphs which are attested in the presence of a Ø-realization of past tense. Similarly catch/caught, with the form caught representing a stem allomorph selected in the context of -t past tense marker. Second, note that the suffixes -Ø and -t are not in fact in competition with each other, as there is no sense in which either one of them is more or less specified relative to the other. Rather, each is fully specified to apply to a given set of forms, and each more specified than the default -ed. Finally, note that while a root may select more than a single realization for a C-functor (cf. (42) and related discussion), this is not the case for the spellout through S-marking, where each root is restricted to an exclusive realization.

As it turns out, all overtly derived verbs in English, i.e. those derived with -ize, -ify, -ate, be-, en-, or de- are exclusively marked with -ed past tense, i.e. the default form. Nor do any of them exhibit stem allomorphs, associated either with the root or with the verbalizing affix. Clearly, for derived verbs, the very same type of generalizations given in (56)–(58) can be replicated for the past tense, as in (60):

(60) a. All possible realizations of past tense in English (may) mark underived roots (including compound roots, cf. understood; mistook).
    b. Only -ed realizes past on (overtly) derived verbs.

As in the case of the C-functors already considered, this generalization can be captured by brute force, namely, the accidental absence of verbalizing affixes in the insertion environment of the past tense realizations -Ø and -t. As in the case of ATK, the case of the verbalizing triplet -ize, -ify, -ate, or the case of adjectivizing triplet -al, -ous, -ic, I submit that a generalization would be missed.  

37 For Halle and Marantz (1993) as well as Embick (2010) and similar executions, capturing the generalization in (60) is not a trivial matter, as the PST morpheme in that system may only attach to v, in a structure that is minimally branching, as in e.g. [v [√TAKE]], and where the spellout of v as Ø or as -ize is structurally irrelevant. If, however, all occurrences of PST attach to branching structures, the generalization in (60) clearly cannot be stated as such. I return to this matter in some detail in Chapter 7, section 3.4 in the context of a broader discussion on the existence of (putative) zero realization for C-functors.
In turn, an intuitive account for the picture emerging here is very readily available. According to such an intuitive account, there are, indeed, default phonological realizations. For V>N (in suffixal contexts) it is /\textit{p}tion/; for N>V and A>V it is /\textit{p}size/; and for past tense it is, of course, /\textit{p}edl/, as it is /\textit{p}s/ for plural. In turn, there is no real competition between forms, as such. The default form is precisely the form available when no selection information is otherwise available. By entailment, then, any occurrence of -\textit{ous}, -\textit{ance}, -\textit{ify} and so on is directly selected, precisely along the lines which guide the selection of nominalizers for the compound roots in (42). Furthermore, by entailment, every case of -\textit{ous}, -\textit{ance}, -\textit{ify}, and so on involves a local relationship with a selector (as per the structure in (48)). Default, then, is what emerges whenever no local relationship with a selector can be established, or alternatively, when the root chooses not to exercise any such selection. By extension, then, all affixes to which /\textit{p}al/, /\textit{p}ize/, and /\textit{p}ation/ attach (as well as all those which host /\textit{p}ness/ and /\textit{p}ity/: see Chapter 7, section 6) do not exercise any phonological selection, and allow affixes attaching to them to be instantiated as a default.

Crucially, the execution of this intuition requires assuming several important things, some of them quite conservative, but others which have come to be challenged, and yet others that require revisiting the notion of complex structure as it applies to morphological constituents. First, note, a phonological index is a \textit{sine qua non} of phonological selection. If roots are, as we propose, phonological indices, it follows that selection will always be in principle available for the most deeply embedded constituent within the C-core. Should it turn out to be the case that some affixes do exercise selection (e.g. see fn. 36), then it must be the case that such affixes come with a phonological index, i.e. they have no licit variants which are functorially equivalent (and note, for the case of -\textit{istic} in fn. 36 this would be IST, indeed a unique realization). Unless these restrictions are in place, there would be no way to block a local relationship between any affix and any other affix, returning us to the very missed generalizations we were trying to account for. Thus highlighted, we note that the existence of phonological selection as systematically exercised by roots vs. the potentially phonologically abstract nature of functors, which may be differently realized across their occurrences as \textbf{dependent on roots}, bolster the formal distinction between roots and functors, as well as the view of roots as fundamentally phonological, rather than semantic or syntactic units.

Recall now that I adopted, for inflectional spellout, a fully realizational system, suggesting that phonological representations such as /\textit{p}sang/, /\textit{caught}/, /\textit{ate}/ are the realization of a mono-morphemic head, and not a branching structure. Replicating (20) above, I assumed that the circled representation, effectively \([C=V \pi \sqrt{\text{eatpst}}]\) or \([C=V \pi \sqrt{\text{jumppst}}]\) consults, at PF, the packet of phonological information summoned up by its index, thereby giving rise to the realization of the respective full root entry as based on its phonological index. For \([C=V \pi \sqrt{\text{eatpst}}]\), such consultation would return /\textit{p}ate/. For \([C=V \pi \sqrt{\text{jumppst}}]\), on the other hand, presumably no information is provided, at which point it will revert to the default form /\textit{p}jumped/:
A derived verb eventually to spell out as, e.g., realize would likewise move to \( \{ \langle e \rangle \rangle \), to be marked as PST and to give rise to \([\pi^p_v \text{REAL} C_{\text{V[N/A]}}]_{\text{PST}}\). As is patently clear, the phonological index associated with \( \pi^p_v \text{REAL} \) is no longer locally available, and by assumption, \( C_{\text{V[N/A]}} \) does not have one, \( /\pi \text{ize}/ \) being but a phonological realization of \( C_{\text{V[N/A]}} \). Nor, of course, is there a phonological entry for \( \text{realize} \) in which item-specific phonological information could be listed. A default past tense marking, that available in the absence of any more specific information, is the result.

Similar logic emerges for C-functors. By assumption, the structure of, e.g., spacious or porous is as in (62a), while the structure of, e.g., acidic and bionic is as in (62b):

\[
\begin{align*}
\text{(62a)} & \quad \begin{aligned}
\text{a. } \left[ A \left[ C_{\text{\pi_v SPAC}} \right] C_{\text{A[N]}} \right] \\
& \quad \pi_{\text{POR}} \\
& \quad \pi_{\text{BION}}
\end{aligned} \\
& \quad C_{\text{A[N]}} \rightarrow /\pi \text{ous}/ \\
\text{b. } \pi_{\text{ACID}} \\
& \quad C_{\text{A[N]}} \rightarrow /\pi \text{ic}/
\end{align*}
\]

\[
\begin{align*}
\text{(63a)} & \quad \begin{aligned}
\text{a. } \left[ A \left[ C_{\pi_v \text{FORM}} \right] C_{\text{A[N]}} \right] \\
& \quad C_{\text{A[N]}} \rightarrow \text{default } (/\pi \text{all}/)
\end{aligned} \\
\text{b. } \left[ A_{\text{\pi_v \text{FORM}} \text{N[v]}} \right] C_{\text{A[N]}}
\end{align*}
\]

In (62a–b), the spellout of \( C_{\text{A[N]}} \) may avail itself of information listed in the entry of the root adjacent to it, \( \left[ C_{\pi_v \text{SPAC}} \right] \), \( [C_{\pi_v \text{POR}}] \), \( [C_{\pi_v \text{ACID}}] \), or \( [C_{\pi_v \text{BION}}] \). No such local relations hold for the \( C_{\text{A[N]}} \) in (63), either because \( \pi_v \text{FORM} \) fails to have such information (e.g. in (63a)), or because such information, if available, is not accessible to \( C_{\text{A[N]}} \) attaching outside \( C_{\text{N[v]}} \); given the fact that formation is not phonologically listed, as such, and hence cannot condition its insertion frame (in (63b))). Consequently, \( C_{\text{A[N]}} \) may only be realized as default.

But what is a default form, formally? And more crucially, what is the comparison set relative to which such a default realization can be defined? Any attempt to answer this question reveals, directly, that a default and a comparison set may only be defined relative to the categorial selection of some C-funcor, or else any comparison of -ation and -ance, or -al and -ous simply could not be defined. Grouping together -ation+kin, -ize+kin, and -al+kin, or for that matter the different realizations of the English past tense marking, presupposes that they are phonological realizations of the ATK set could compete is if the ATK set defines a formal object
which projects a category, N, and which has a fixed Categorial Complement Space (CCS). If ATK functors are either non-categorial or do not select a CCS, however, such competition or default become meaningless and undefinable, and the generalizations in (56)–(58) simply vanish, as does any attempt to account for them. The notion of “default”, then, presupposes the existence of categorial properties for the relevant suffixal realizations.

One important aspect of the preceding discussion must be highlighted at this point. As the reader no doubt already noted, crucial to the analysis is the claim that, e.g., \[ C=V \] \[ √ \] form as well as \[ C=N \] \[ √ \] form are mono-morphemic, while e.g. \[ √ \] realize is bi-morphemic. It thus emerges directly that the account for the distribution of default realizations for functors, be they S- or C-, is contingent on the assumption that the categorization of roots need not add structural complexity, and that there remains a sense in which form, even in clearly verbal contexts, is less complex than realize. It therefore also follows that the categorization of, e.g., \[ √ \] form as either N or V could not be accomplished by postulating some V or N node (alternatively v or n), which may be realized either as zero or as -ize or -ation, respectively. In turn, however, this conclusion directly complements the system of contextual categorization proposed in Borer (2005a, b) and in this work, a matter I return to in considerable detail in Chapter 7.

A second observation concerns the formal interaction between internal re-merge in Extended Projections, as depicted in (61) (see section 6.2.1), and locality. Note, specifically, that locality as defined in (49) is in terms of terminals. That this must, indeed, be the case emerges from the fact that ExP-internal re-merge does not impact the ability of a root to phonologically select its past tense spellout. To see that this is the case, consider the schematic structure in (64) assuming, as is hardly controversial, that at least one ExP-segment may intervene between the root and T (although it is by no means universally agreed what that node might be, note). For expositional purposes, suppose we take this node to be ASP\(_Q\), the node otherwise responsible for the emergence of telicity and the licensing of internal arguments, and where range is assigned by the specifier, thereby allowing the (V-equivalent) root to move:

\[
\begin{align*}
(64)\quad \text{a. } & \text{[T PST}^T \ll [C=V \sqrt{\text{EAT}^{Q-PST}}] \gg [\text{ASP}_Q \text{DP}_Q \ll [C=V \sqrt{\text{EAT}}]] \\
& [\text{ASP}_Q \text{DP}_Q \ll [C=V \sqrt{\text{EAT}}]] \\
\text{b. } & \text{[T PST}^T \ll [C=V \sqrt{\text{EAT}}] \gg [\text{ASP}_Q \text{DP}_Q \ll [C=V \sqrt{\text{EAT}}]] \\
& [\text{ASP}_Q \text{DP}_Q \ll [C=V \sqrt{\text{EAT}}]]
\end{align*}
\]

In (64a), eat is clearly allowed to proceed to determine its past tense realization. Realize, in the same context, as in (64b), nonetheless would not be allowed to do so. It thus emerges that the brackets accumulated, so to speak, by \[ √ \] EAT during its upward climb do not matter, precisely because the movement involved does not

---

38 Depending on specific approaches, such nodes may include grammatical aspect, argument structure affecting nodes, whether ASP\(_Q\) as assumed here or CAUSE and similar nodes, as well as Voice, etc. Note that such nodes are distinct, even in Distributive Morphological executions, from categorizers. We note that v, in DM, is ambiguously used to refer to a categorizer (by assumption attaching to a root and only to a root) and an argument-structure relevant node, similarly labeled v, which licenses external arguments and which perforce must be allowed to merge outside categorization, or it would be predicted to allow non-compositional Content. See Chapter 9 for discussion.
create a branching structure nor is there a distinct intervening head. The conclusion, which appears empirically amply warranted, is that there must be a formal distinction between, e.g. ASP\textsubscript{q} in (64a) and e.g. C\textsubscript{N[A/N]} in (64b). The former, specifically, does not create locality effects, but the latter does, giving rise to realized as well as to realization, but not, e.g., to *realizance or to *realiz(alt)ive.

Finally, an interesting caveat. In one specific domain, it does appear that English C-functors exercise some measure of individual selection. The selection, however, is not that of a specific attachment configuration, but rather its absolute blocking. Specifically, some English C-functors absolutely reject any further categorial affixation. To wit, neither -\textit{ity} nor -\textit{ness} allow further affixation, including by ostensibly productive affixes such as -\textit{al} or -\textit{ist/ism}, otherwise attaching to derived nouns, and even bar -\textit{less} (note that some, but not all of these cases could be reduced to boundary conflicts).\footnote{I specifically do not assume that -\textit{ance/-ence} nominals are derived from their adjectival or nominal -\textit{-ant/-ent} variant any more than -\textit{ism} nominals are derived from their adjectival or nominal -\textit{ist} variants. See fn. 41 of Chapter 7 for a brief discussion.}

\begin{itemize}
\item \texttt{brevitial}; \texttt{conformitional}; \texttt{moralititial}; \texttt{totalititial}
\item \texttt{brevitize}; \texttt{conformitize}; \texttt{moralitize}; \texttt{totalitize}
\item \texttt{brevitiful}; \texttt{conformitiful}; \texttt{moralitize}; \texttt{totalitize (and compare pitiful)}
\item \texttt{brevitiless}; \texttt{conformitiless}; \texttt{moralitiless}; \texttt{totalitiless (and compare pitiless)}
\item \texttt{brevit(y)ist}; \texttt{conformit(y)ist}; \texttt{moralit(y)ist}; \texttt{totalit(y)ist}
\end{itemize}

\begin{itemize}
\item \texttt{kindnessal}; \texttt{happinessal}; \texttt{deafnessal}; \texttt{daftnessal}
\item \texttt{kindnessize}; \texttt{happinessize}; \texttt{deafnessize}; \texttt{daftnessize}
\item \texttt{kindnessful}; \texttt{happinessful}; \texttt{deafnessful}; \texttt{daftnessful}
\item \texttt{kindnessless}; \texttt{happinessless}; \texttt{deafnessless}; \texttt{daftnessless}
\item \texttt{kindnessism}; \texttt{happinessism}; \texttt{daftnessism}
\end{itemize}

While the information that -\textit{ity} or -\textit{ness} define an absolute right edge, so to speak, is certainly specific to these items, we note that it does not amount to an item-specific selection exactly insofar as it does not specify that some items may, but others may not, follow these affixes. We note, further, that -\textit{ity} and -\textit{ness} define the exhaustive set of C\textsubscript{N[A]} in English. Furthermore, insofar as they are distinct from each other, their distinctions are phonological, with -\textit{ity} associated with a + boundary and triggering stress shift, while -\textit{ness} is associated with a # boundary and does not give rise to stress shift. Under the plausible assumption that they represent differing phonological realizations of the same function in different phonological contexts, the appropriate statement concerning their distribution may be stated relative to the functor C\textsubscript{N[A]} in English, and is thus divorced from any specific phonological realization. It thus emerges that insofar as clear and specific restrictions do accompany some C-functors,
they cannot be stated on items such as \textit{-ness} or \textit{-ity}, or \textit{-ous} or \textit{-al}, but rather must be assumed to hold for a C-functor regardless of its phonological realization.

6.3 Extended Projections, Functors, and Roots

Because the main focus of the present work is to investigate the syntactic structure of complex derivatives, it is clearly C-functors, rather than S-functors, that are at its center. In fact, insofar as S-functors are discussed here altogether, it is primarily in order to delineate the ways in which they are formally distinct from C-functors. From this perspective, then, suppose we consider in greater detail the properties of structures involving S-functors. I suggested that in configurations such as \((19)\)–\((20)\), the S-functor and the open value to which it assigns range constitute a head-pair, and thus \(<\text{THE}^{D}, \ll<e^{\text{THE}}\gg_{D}>\) or \(<\text{PST}^{T}, \ll<e^{\text{PST}}\gg_{T}>\). When we investigate the division of labor, so to speak, between the members of the head-pair, the following picture emerges:

(67) \begin{tabular}{lll}
\text{Head-pair: division of labor} & \ll<e\gg & S-functor \\
  a. project & yes & no \\
b. has a category & yes (derived) & no \\
c. has inherent semantics & no & yes \\
\end{tabular}

To the extent that it can be said that PST or THE or EVERY exercise any selection, it is specifically semantic selection. In turn, we could say that the open value to which EVERY assigns semantic range is perforce to be labeled as D, and where D is the generalization over the type of S-functors that can assign range to the same node. It is precisely in this sense that semantic selection determines categorial properties, which are hereby notated as a superscript, and hence EVERY\(^{D}\), to mean an S-functor, EVERY, which is a member of a set of functors all of which are presumably potential range assignors to the same open value, call it D, and where “\textit{same open value}” refers to a syntactic position (cf. 71B). In table (21), I already undertook to compare the distinct categorial and selectional properties of S-functors and C-functors. The relevant parts are replicated below, with the properties of C-functors, as postulated, having now received considerable support from the discussion in section 6.2 (and recall that for C-functors, it is \((68b)\) that entails \((68d)\) rather than the other way around):

(68) \begin{tabular}{lll}
\text{C-functors} & S-functors \\
  a. Category & yes (axiomatic) & none \\
b. CCS & yes (axiomatic) & none (reducible to S-selection) \\
c. S-selection & possible; doesn’t predict CCS & yes (axiomatic; determines CCS) \\
d. Projection & \(X_{\text{min}}^{\text{must project}}\) & \(X_{\text{min/max}}^{\text{cannot project}}\) \\
\end{tabular}

The question we must now ask, however, is not how S-functors compare to C-functors, but how head-pairs compare to C-functors, or, more narrowly, how the properties of, e.g., \(C_{A[N]}\), which may spell out in English as \textit{-al} or \textit{-ic} or \textit{-ous}, compare with the properties of, e.g., \(\ll<e^{\text{THE}}\gg_{D}\), the latter, by assumption, having both (inherited) semantic meaning and a projecting categorial label, albeit a derived one.
Specifically, and using the same diagnostics as thus far outlined, such a comparison yields a considerably bigger prima facie similarity, albeit a derived one for $\langle e^{\text{THE}} \rangle_D$, than that exhibited between C-functors and S-functors in isolation, especially given the rather common assumption that D must project, and that it does delimit the categorial properties of its complement:

<table>
<thead>
<tr>
<th></th>
<th>$C_A[N]$</th>
<th>$\langle e^{\text{THE}} \rangle_D$</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. Category</td>
<td>yes (axiomatic)</td>
<td>yes (derived)</td>
</tr>
<tr>
<td>b. CCS</td>
<td>yes (axiomatic)</td>
<td>yes</td>
</tr>
<tr>
<td>c. S-selection</td>
<td>no</td>
<td>yes (derived)</td>
</tr>
<tr>
<td>d. Projection</td>
<td>$X^\text{min}$(must project)</td>
<td>$X^\text{min}$(must project)</td>
</tr>
</tbody>
</table>

There remains, however, a rather crucial structural difference between C-functors and any categorized instance of $\langle e \rangle$, which the table in (69) fails to highlight, and which involves the fact that all categorized instances of $\langle e \rangle$, ($\langle e^Y \rangle_X$) are segments of Extended Projections, and that to the extent that they have a CCS, such a CCS would likewise need to be a segment of the very same Extended Projection. To illustrate, suppose we assume that the internal structure of nominals is as in (70a), in essence following Borer (2005a) or, for that matter, as in (70b) as proposed in Borer and Ouwayda (2010):

(70) a. $[D \# [CL [N]

b. $[D \# [Q [CL [N]

In Borer (2005a), the structures in (70) come with a number of important theoretical assumptions, quite a few of them shared across varying accounts of Extended Projections (and see below for an attempt to derive some of them):

(71) $\text{Extended Projection}_{\text{def}}$:
A. There must be a C-core such that it is dominated by all segments of the Extended Projection (ExP-segments).
B. The relative order of merger of (range-assigned) ExP-segments within any Extended Projection (type) is universally specified.
C. Subject to A, every ExP segment is optional, but its presence/absence has interpretational consequences.

40 With #P a node devoted specifically to cardinals and crucially distinct from quantifiers and merging below QP.
41 Specifically, (71A–B) are typically assumed within the Cartographic approach (cf. Rizzi 2004; Cinque 2002). Not so, however, (71C), which deviates from cartographic approaches, where it is explicitly assumed that Extended Projections may only be pruned from the top down.

No attempt is made here to compare this account to "fusion"-type approaches, as in Giorgi and Pianesi (1997) or nano-syntactical approaches, in which, in essence, what merges are abstract features which may cluster differently in different languages to give rise to distinct spellout possibilities. While certainly intriguing, the empirical consequences of such proposals are rather difficult to evaluate in the absence of a restrictive theory of features. For some discussion of this specific point see Boeckx (2010).
The configurations in (70) as well as the statements in (71) all appeal to the notion of an Extended Projection, originally from Grimshaw (1991) (and see also van Riemsdijk 1998), and which is as intuitively appealing as it is difficult to define. All the more so as it is entirely possible that the C-core is not itself dominated by a C category (e.g. the projection of some C-functor, say $C_N$ of some sort), but rather is a (bare) root that is rendered categorically equivalent contextually precisely in the presence of an Extended Projection with particular properties (and see Chapter 7 for a detailed discussion of categorization). As I will show, the C-core, in the absence of a named C-functor, could only be defined in terms of what is distinct from it, i.e. the properties of nodes which are not part of the C-core, and which are thus ExP-segments. Suppose, however, we set this question aside for the time being, rather proceeding to offer an initial description of Extended Projections as the set of S-functor-licensed ExP-segments, which dominate the same C-core. By way of making explicit what C-core is, suppose we define it as in (72), with the intention of ensuring that while some $C_{\text{max}}$ which is a projection of some C-functor could constitute a C-core, it can only do so providing there is a root at the very bottom of the relevant set of projections. Note that the C-core need not be maximal (e.g. as in (72b)), and that non-maximal instances of C-cores may have relevant properties (see Chapter 9, section 3). In the context of Extended Projections, however, it is difficult to see any ramifications for the absence of maximality, as any Extended Projection which dominates a non-maximal C-core per force dominates the maximal instantiation as well.\footnote{Insofar as all functions are by assumption transitive, and insofar as roots never are, the intransitivity of $\beta$ ensures that it cannot be a functor. By failing to attribute any more specific properties to the most deeply embedded element in the C-core, note, we avoid the need to define a root as such, leaving open the possibility for $\beta$ to be an arbitrary nonsense phonological representation. See Chapter 8 for some relevant discussion of this point.}


\begin{equation}
(72) \quad C_{\text{core}}_{\text{def}}:
\begin{align*}
A. & \quad \alpha \text{ is a C-core iff } \alpha \text{ is } C\text{-equivalent and there is a } \beta \text{ such that } \beta \text{ is contained in } \\
& \quad \alpha \text{ and } \beta \text{ is intransitive, and for all } x, \alpha \text{ dominates } x \text{ and } x \text{ dominates } \beta, x \text{ is } \\
& \quad C\text{-equivalent.}
\end{align*}
\begin{align*}
B. & \quad \alpha \text{ is maximal iff there is no } \gamma \text{ such that } \gamma \text{ is C-core and } \gamma \text{ immediately dominates } \alpha \text{ (where } C \text{ stands for the traditional inventory of "lexical" categories. Note that trivially, all instances of } C \text{ are } C\text{-equivalent).}
\end{align*}
\end{equation}

In view of the structures in (70), and the statements in (71), as well as some preliminary intuitive notion of what an Extended Projection might be good for, consider what categorial restrictions $\ll c > D, (or \ D, in more standard terms) may be placing on its complement. We couldn’t say that it selects a # (or $\ll c > D$), as by assumption, # may be missing. Nor could we say that it selects CL, as that, too, may be missing. Finally, we couldn’t say that it selects N. While by (71A) there will always be a C in an Extended Projection, and presumably, in the context of D it would be N, that N need not be a sister of D, and so by standard assumptions, D cannot select it. Needless to say, the more members in the Extended Projection, the bigger the

\footnote{If compounds involve the existence of two C-cores, note now, it must nonetheless remain the case that the head of the compound, so called, does not in actuality select the non-head or functionally act on it in any way.}
difficulty of stating what the categorial selection properties of D are. Finally, we note, the problem is not restricted to D, but characterizes each of the members of the Extended Projections in (70), with the possible exception of the lowest one, where categorial selection may turn out to be rather well behaved. Thus, presumably, CL, wherever and whenever it merges, will do so with some N-equivalent constituent.

But members of Extended Projections, D included, certainly do seem to be operating under some sort of categorial restrictions. For instance, D could not merge directly with T. Furthermore, and regardless of how far down it may be, there will be an N, so categorized, in any Extended Projection which includes D. As it turns out, now, these restrictions, minimal as they may be, replicate themselves rather exactly for other ExP-segments of any one given Extended Projection. D may not merge with T, but neither can # or Q or CL. Somewhere within the Extended Projection including D there needs to be an N, which is exactly true of # or Q or CL. It thus appears that all segments of a given Extended Projection share similar restrictions, and we can think of them as a set, sharing those restrictions. In turn, suppose we characterize the selectional properties of, e.g., D in terms of such a set, and allow the complement of D to be a set which consists of {D, Q, #, CL} (as well as any other potentially necessary member of an (ultimate) nominal Extended Projection). Suppose, then, we label the relevant set of the nodes which constitute the relevant Extended Projection {Ex[N]} set, and say that the complement set of D is {Ex[N]}.

It now appears, however, that we may postulate, for Q, #, and CL, the very same complement set. Mishaps, such as (illicit) reiteration of the same terminal, or alternatively, # merging above D, would presumably be excluded by (71B), quite independently needed, I believe, in any account. The situation, for the functional heads that would (ultimately) constitute a nominal Extended Projection is thus as in (73):

\[
\begin{align*}
\text{(73) a. } & \text{ } \emptyset \rightarrow X, X \in \{\text{Ex[N]}\} / [\_\_\_\_\_\_ \{\text{Ex[N]}\}] \\
& \emptyset \rightarrow D / [\_\_\_\_\_\_ \{\text{Ex[N]}\}] \\
& \emptyset \rightarrow # / [\_\_\_\_\_\_ \{\text{Ex[N]}\}] \\
& \emptyset \rightarrow Q / [\_\_\_\_\_\_ \{\text{Ex[N]}\}] \\
& \emptyset \rightarrow \text{CL} / [\_\_\_\_\_\_ \{\text{Ex[N]}\}]
\end{align*}
\]

b. \{\text{Ex[N]}\}: \{D, Q, #, CL\}

Consider now our C-core. Two potential cases should be under consideration here. One involves a root which is immediately dominated by some ExP-segment, i.e. where no C-functor merges between the root and the ExP domain. The second involves the maximal projection of some C-functor, and with members of the ExP set, the ExP-segments, merging above that. As is entirely clear from the picture in (73), neither type of C-core can be a member of \{\text{Ex[N]}\}. A root, quite regardless

\[43\] Insofar as the claim here is that N is by assumption no more than the label for the complement space defined by an Extended Projection with some properties, and hence a derived notion, notating its Extended Projection as \{\text{Ex[N]}\} may appear circular. Such circularity could be avoided, of course, by notating the relevant set as, e.g., \{\text{Ex[\alpha]}\} and then proceeding to state that the (common) categorial complement of \{\text{Ex[\alpha]}\} is definitionally N (or N-equivalent). The reader is spared this notational complexity in the hope that the formal intention is clear.
of whether it is categorized or not, does not have a complement, and hence its merger cannot be conditioned by such a complement, as would be required by (73). As for C-functors, they, likewise, could not be members of the inherently recursive set characterized by \{Ex[N]\} because they are, fundamentally and inherently, not members of a recursive set—they need not, and typically do not, share any categorial properties with their CCS, nor can they be sensibly defined in terms of segments of a single bigger whole. If, then, the most fundamental property of Extended Projections involves the recursive complement set in (73), it follows that neither C-functors nor roots could be members of such sets.

If on the right track, note, this translates into viewing an Extended Projection (to the exclusion of the C-core) as a single object with internal segments, and with the segments under consideration ordered in accordance with universally available principles. Each of the ExP-segments, note, only exercises selection insofar as it restricts the members of the set that comes to be the Extended Projection (e.g. D would select \# but not T). As a whole, however, the entire object, i.e. the entire ExP-segment set, can and does exercise “external” selection, and specifically, may define a Categorial Complement Space. Utilizing the notation we already used for C-functors, then, we may notate the relationship between ExP-segments as sets, and their complement domain as in (74), with a bracketed subscript indicating (redundantly, note) their Categorial Complement Space:

\[
(74) \quad \{Ex[N]\}_{[N]}; \{Ex[V]\}_{[V]}; \{Ex[A]\}_{[A]}
\]

The assumption that Extended Projections consist of segments which themselves constitute a recursive set establishes a clear formal difference between S-functors—by assumption range assignors to open values of such segments—and C-functors. We note that, interestingly and not trivially, where parallelism does exist, it is not between ExP-segments and C-functors as such, and most certainly not between S-functors and C-functors, but between the Extended Projection set, in its entirety, and C-functors. The most striking result of this view of Extended Projections, then, is that it transcends the formal difference between C-functors and S-functors, creating, rather, a similarity between isolated functors, C-functors, and functors which are worked into a multi-member representation, nonetheless acting, as a whole, as a single selecting element. It is from that perspective that we can now derive directly the fact that at the “bottom” of every Extended Projection there must be a constituent which is formally distinct from whatever terminals or segments otherwise merge to give rise to the Extended Projection set. For if that were not the case, the transitivity of the ExP-segment set as a whole cannot be met.

Suppose we now notate as C any merging terminal which is not an ExP-segment. Roots, we note, will thus be automatically notated as C, as would be, of course, all C-functors. For completeness sake, consider the following configuration, with \(<e>_1>\), a range-assigned value projecting the ExP-segment label i, \(<e>_2>\) projecting ii and so on:

\[
(75) \quad <e>_1 <e>_2 <e>_3 <e>_iv <e>_v W_{x[v]} \quad <e>_iv <e>_v \quad C
\]

Consider now the potential Extended Projection consisting of the ExP-segment set \{<e>_1 <e>_2 <e>_3 W_{x[v]}, <e>_iv <e>_v \}. W_{x[v]}, we note now, and regardless
of whatever other properties it may or may not have, is not a member of a recursive set, and insofar as there exists a recursive set of \{\langle e \rangle_i, \langle e \rangle_{ii}, \langle e \rangle_{iii}, \langle e \rangle_{iv}, \langle e \rangle_{v}\}, all self-selecting, does not belong to it. As a result, it is by definition C. As it is not dominated by (the projections of) \langle e \rangle_{iv}, \langle e \rangle_{v}, the latter must constitute a different Extended Projection. Effectively, then, anything which is not an ExP-segment once embedded under any ExP-segment, would immediately become its C-core, forcing any element merged below it to be either C or a segment of a distinct Extended Projection. C-cores, in and of themselves, can, of course, merge with an Extended Projection. Schematically, (75) corresponds to the structure I proposed for AS-nominals, with W standing for some realization of C_{N[V]}, e.g. ation, which may merge with an Extended Projection (e.g. E, by assumption a member of \{Ex[V]\}). In turn, C_{N[V]} itself must be dominated by an Extended Projection (presumably \{Ex[N]\}). What is excluded, however, and desirably so, is the existence of a single “mixed” Extended Projection consisting of all instances of \langle e \rangle, either including W or alternatively skipping it.

We note, nonetheless, that W_{X[Y]} as it now stands, is not a licit C-core, nor is it obvious how the CCS of W_{X[Y]} is met and as a result the Extended Projection \langle e \rangle_i, \langle e \rangle_{ii}, \langle e \rangle_{iii} W_{X[Y]} in (75) is not well formed. While some remedy for the CCS issue may be offered if the requirement for the CCS [Y] can be met by some Extended Projection selecting [Y] (i.e. \{Ex[Y]\}), the C-core problem would not be thus helped. With this conclusion in mind, however, suppose we consider again the structure of AS-nominals as in (76) when embedded under (a much abbreviated) \{Ex[N]\}. The C-core of that \{Ex[V]\] Extended Projection must be V and is V, and is, presumably, well formed in the presence of roots such as \(\sqrt{\text{form}}\) or \(\sqrt{\text{crystal}}\), themselves intransitive. What, however, of the C-core of \{Ex[N]\}? Even if we were to assume that the merger of C_{N[V]} with \{Ex[V]\} could satisfy its CCS, and such a move is by no means self-evident, it remains the fact that in the absence of an intransitive C instance at its core, \{Ex[N]\} is not well formed:

\begin{align*}
\text{(76)} & \\
\text{#} & \\
\text{C}_{N[V]} & \\
\text{C}_{N[V]} & \\
\text{E} & \\
\text{E} & \\
\text{(ASP}_Q) & \\
\text{ASP}_Q & \\
\text{C=V crystalize, form}
\end{align*}
The solution, in turn, is straightforward. \{Ex[N]\} acquires a well-formed C-core and the CCS of \(C_N[v]\) are both satisfied if, and only if, the V-core of \{Ex[V]\} moves so as to merge with \(C_N[v]\). Recall now that head movement up the Extended Projection ladder is obligatory in the presence of abstract range assignors, and blocked in the presence of overt S-functors such as THE or modals. Recall further that head movement, in such cases, consists of re-merger, rather than adjunction. It now emerges that in AS-nominals, or, for that matter whenever a C-functor merges with an Extended Projection, two conditions must be met. First, the C-core of the (lower) Extended Projection must satisfy the CCS of the C-functor. Second, all range assignments within the relevant Extended Projection must be abstract, thereby allowing, indeed forcing, head movement. The resulting more fully articulated structure is in (77) (and see Chapter 2, section 3 on range assignment to \(\ll e \gg_E\) and to \(\ll e \gg_{ASP_Q}\), by assumption segments of \{Ex[V]\}): 

More broadly, what emerges from the definition of Extended Projection as a self-selecting set is that there must be merging elements in the grammar which are distinct from ExP-segments, call them C. Even more broadly, it emerges from the definition of all functors as transitive elements that there need to be elements in the grammar that are not functors, that are intransitive, and that are semantically and syntactically inert, call them roots. Finally, it emerges that only roots may occur as the most deeply embedded terminal within any Extended Projection. (78), in which our “intermediate” C-core consists solely of a root, is illicit, as roots are by definition intransitive:

And finally, note that formally, the CCS of \(C_N[v]\) is met in an identical fashion in AS-nominals as it is in R-nominals, with the root, in the latter, likewise adjoining to the C-functor, and thus satisfying its CCS:

\[(77)\] 

\[
\begin{array}{c}
C_N[v] \\
E \\
[_{C=v}V^{\alpha\beta}] \\
C_N[v] \\
\ll e \gg_E^\beta \\
\ll e \gg_{ASP_Q}^\beta \\
DPO \\
\ll e \gg_{ASP_Q}^\beta \\
C=v
\end{array}
\]
What emerges, we note, is by no means trivial. First, insofar as, e.g., ATK, a $C_N[v]$ functor, may head both R-nominals and AS-nominals, this correlation need not be stated as a disjunction (e.g. ATK selects either V or $\{\text{Ex}[V]\}$). Nor does it necessitate the actual marking of $\{\text{Ex}[V]\}$, in and of itself, as $+V$ (e.g. as in Grimshaw 1990). Instead, the fact that ATK may only merge either directly with V (or V-equivalent), or with $\{\text{Ex}[V]\}$, but not with any other functional structure (e.g. $\{\text{Ex}[N]\}$) emerges from the fact that $\{\text{Ex}[V]\}$, by definition, has a V-core which could, under certain structural conditions, move and merge with $C_N[v]$ thereby satisfying its CCS and creating a licit C-core (and see section 3.4.1. of Chapter 9 for some more on this point). Second, we can now derive the result that although the structure of AS-nominals includes fully articulated functional structure, no overt S-functors may occur within AS-nominals, as such overt S-functors would block the movement of the V-core, thereby resulting in the impossibility of V merging with $C_N[v]$ and thus in a non-converging derivation.\footnote{The system does not, however, predict the absence of “inflection” inside derivation insofar as abstract range assignment may result in (non-morphemic) phonological marking, as noted already in Chapter 1 and which would not be excluded in representations such as (77). We note, in this context, that in some Slavic languages, perfective prefixes, by assumption range assignors to $<\epsilon>_{\text{ASP-Q}}$, do occur in AS-nominals specifically with a perfective function, but are excluded, as such, in R-nominals (see Rozwadowska 1998 for discussion. See Borer 2005b for the argument that Slavic prefixes are not only range assignors to $<\epsilon>_{\text{ASP-Q}}$ but specifically the phonological realization of abstract, non-morphemic range assignment). I return to the discussion of this and potentially similar cases in section 3 of Chapter 10.}

6.4 Outstanding: Linearization, Adjunction, Prefixes

This final section is devoted to the tentative discussion of a number of issues, primarily concerning linearization and its interaction with movement and with headedness. Crucially, while the discussion here informs some of the structural decisions made throughout this work, central questions remain unresolved and some conclusions are tentative, primarily pointing the way to future research.

By assumption, the merger of A and B is asymmetrical, in that either A or B, but not both, will come to be the label associated with the combined [A B] constituent. We note that by the logic of the system, once this happens, the projecting node

\footnote{For more on the interaction between iterative head re-merger and C-functors in the context of a phase-based execution, see Chapters 9 and 10.}
immediately becomes an instance of min, while the non-projecting node immediately becomes an instance of max:

\[(80) \begin{align*}
\text{a. } & A^{\text{max}} \\
& B^{\text{max}} & A^{\text{min}} \\
\text{b. } & B^{\text{max}} \\
& B^{\text{min}} & A^{\text{max}}
\end{align*}\]

Whether it is A or B that will project, however, is not information that is given in the configurations in (80) as such, nor is any information available on the ultimate linear order of A and B, and whether, under any of the projection combinations in (80), A>B or B>A.

Suppose we assume now that some linearization instructions are built into the grammar, specifically through the (informal) statement in (81) (and see Georgi and Müller 2010 for a similar claim):

\[(81) \textit{Sister First}^{45}
\]

Internally merged constituents are linearized to the left of their merge target.

\[45 \text{ Suggesting that moved constituents are specifically linearized to the left of whatever they merge with is at least up to a point identical to the claim that movement is always to the left. Insofar as movement obeys the Extension Condition, and maintaining that linearization is constrained by some version of Kayne’s (1994) LCA, “Sister First” states exactly that result. Differences do, however, emerge if we consider trickier issues such as head adjunction, and specifically, the precise notion of c-command that would be needed in order to linearize the configuration in (i), by assumption unordered and hence compatible with both (iia) and (iib). (iia–b), in turn, are presumably linearized identically:}\]

\[(i)\]

\[\begin{align*}
& A \\
B & A
\end{align*}\]

\[(ii) \begin{align*}
\text{a. } & A \\
& B & A \\
\text{b. } & A \\
& B & A
\end{align*}\]

Given the unordered representation in (i) and the presumed licit output in e.g. (iib), however, defining movement as “leftward”-bound is impossible, nor is it obvious that the Extension Condition is obeyed here. An attempt to linearize (iia–b) by appealing to c-command, on the other hand, would need to avail itself of the notion of a categorial segment, as in Kayne’s original formulation, but the notion of “segment” is altogether difficult to reconcile with BPS, where the reiteration of e.g. A^{min} is formally incoherent. Suggesting, on the other hand, that moved constituents must be realized as Sister First does yield the correct result quite straightforwardly, forcing B to precede A in both configurations.

Intuitively, Sister First appeals, albeit informally, to the notion of a phonological edge, requiring, effectively, that the “leftward” growth of syntactic derivations should have a phonological correlate. This said, I will not pursue this matter any further here, nor will I pursue the degree to which it may be generalized to other languages. As noted at the onset, the discussion of linearization and headedness in word structure must remain tentative for reasons that shall become clear shortly, making the pursuit of an independent justification for Sister First premature.
Given a merger of A and B, it is now easy to see that by remerging either A or B, the issue of linear order is resolved:

\[(82)\]
\[
\begin{align*}
\text{a.} & \quad B > A \\
\text{b.} & \quad A > B
\end{align*}
\]

As it turns out, the structures in \((82)\), as such, not only resolve the issue of linear order, but they further resolve the issue of projection. Consider, specifically, the Uniformity Condition proposed in Chomsky (1995a):

\[(83)\]
\[
\text{Chain Uniformity Condition:}
\]
A chain is uniform with regard to phrase structure status. (p. 253)

Suppose we now take the uniformity under consideration to be as defined by either \textit{min} or \textit{max} instantiations of categories. Once applied to the structures in \((82)\), now, it emerges directly that if nothing else is to be specified, the direct entailment is that whatever re-merges and is linearized to the left may not project. \((84a–b)\) are thus licit derivations, but not so \((84c–d)\):

\[(84)\]
\[
\begin{align*}
\text{a.} & \quad A \\
\text{b.} & \quad B \\
\text{c.} & \quad * \\
\text{d.} & \quad *
\end{align*}
\]

In \((84a, b)\), the moved constituent, be it A or B, is uniformly an instance of \(X^{\text{max}}\) in all its occurrences, as is required. In \((84c, d)\), however, this cannot be the case. If, e.g., A in \((84d)\) projects after remerging with B, then it is, perforce, an instance of \(A^{\text{min}}\). As it has failed to project in its original merger-with-B position, however, it is in that position an instance of \(A^{\text{max}}\). Uniformity is thus violated, and both \((84c, d)\) are excluded. As has been observed, Uniformity, thus conceived, excludes head adjunction. As an illustration, consider e.g. the structure in \((85)\), where a (projecting) \(N^{\text{min}}\) is incorporated from within \(N^{\text{max}}\) and adjoined to V. By Uniformity, and being the highest instantiation of its category, the remerging N must be \(N^{\text{max}}\). By assumption, however, it is (exclusively) \(N^{\text{min}}\) in its original merger position, having projected. The derivation, as a result, is illicit:
The exclusion of head movement by Uniformity, however, is restricted to a very specific configuration—one in which internal merger applies to an instance of $X_{\text{min}}$ which is distinct from $X_{\text{max}}$ (i.e. it is not an instance of $X_{\text{min/max}}$), and in which the re-merged $X_{\text{min}}$ does not re-project. To see this, consider first the latter case. Here, a $\text{min}$ instantiation re-merges and then re-projects, and the output is thus fully compatible with Uniformity:

That a head re-merger and re-projection is compatible with Uniformity is a point already noted by Ackema, Neelman, and Weerman (1993) as well as by Georgi and Müller (2010), and is, in fact, precisely the execution which I adopted for the movement of heads within Extended Projections, as outlined in Chapter 1 and in sections 2.1 and 3 of this chapter. As the reader may also recall, this is the execution that was implemented in deriving movement within the event domain of AS-nominals, in Chapters 3–5.

There is, however, another instance of head movement that is compatible with Uniformity, a case in which what re-merges is, to be sure, an instance of $X_{\text{min}}$, but also an instance of $X_{\text{max}}$. Taking the illicit structure in (85) as our starting point, we note that the minimally distinct structure in (87) is licit, Uniformity-wise, although it involves the movement and adjunction of a minimal constituent, a head, which subsequently does not project:

The structure in (87) thus involves head movement but nonetheless conforms to Uniformity. By virtue of having been derived by movement, by assumption always
linearized to the left, we can derive the linear order of V and N. By virtue of N being not only an instance of \textit{min} but also, by necessity, an instance of \textit{max} we also derive the inability of N to project and hence the necessity of the projection of V. V, sister of N, is thus perforce an instance of $V^\text{min}$ exclusively, a head, and the resulting construction is, perforce, head-final.

We have now derived the non-trivial result that head adjunction is possible, and indeed possibly mandatory, precisely for heads that are simultaneously \textit{min} and \textit{max} instantiations. When we turn to complex words, we find that at the very least (otherwise categorized) roots can be viewed, from this perspective, as instances of $\textit{min}/\textit{max}$. It thus emerges that at least when it comes to the merger with categorized roots, we have a direct way of deriving the following consequences:

\begin{enumerate}[(88)]
  \item Roots must move.
  \item If adjoined, roots must be linearized to the left of the head they adjoin to.
\end{enumerate}

Bearing (88) in mind, consider now primary compounds, which, by assumption, could involve the merger of two roots. These present a particularly interesting case insofar as no functors are involved and the two members of first merge are, by assumption, formally identical. Suppose we return in this context to a more detailed discussion of the derivations in (16). (89a), specifically, involves the merger of two roots, neither, by assumption, categorized (yet). As such, however, the structure is ill formed, as bare roots are not licit syntactic objects, and no information is available to convert them into appropriate ones. Suppose, however, one of these roots moves and adjoins to the other. We may assume that either one of these roots may, in fact, adjoin in this fashion, giving rise to either (89b) or (89c) (and where linear order within pre-adjunction trees as depicted is random and by assumption, not fixed):

\begin{enumerate}[(89)]
  \item \begin{tikzpicture}
    \node (C1) {$C_1$} child {node (C1max) {$[C_1^{\text{max}}\pi^{\text{HEAD}}]$}} child {node (C1arrow) {$[C_1^{\pi^{\text{arrow}}}]$}};
  \end{tikzpicture}
  \item \begin{tikzpicture}
    \node (C2) {$C_2$} child {node (C2max) {$[C_2^{\pi^{\text{HEAD}}}]$}} child {node (C2arrow) {$[C_2^{\pi^{\text{arrow}}}]$}};
  \end{tikzpicture}
  \item \begin{tikzpicture}
    \node (C1) {$C_1$} child {node (C1max) {$[C_1^{\pi^{\text{head}}}]$}} child {node (C1arrow) {$[C_1^{\pi^{\text{arrow}}}]$}};
  \end{tikzpicture}
\end{enumerate}

While headedness, linear order, and categorial status cannot be determined in (89a), the configurations in (89b) and (89c) are entirely unambiguous in these respects. Specifically, the moved root is now a maximal categorial instantiation, while the unmoved one projects and is thus the head, and the moved constituent now linearizes to the left of the head. While the specific categorial value of C has yet
to emerge in the context of some higher merging ExP-segment, as in (90a–b), the emerging structures are nonetheless clearly licit even in its absence (and see fn. 9 for some comments on the categorizing of the non-head in compounds):

(90) a. (the)  
\[
\begin{array}{c}
\text{[C=C=N} \pi\sqrt{\text{arrow}]_{\text{max}}} \\
\text{[C=C=N} \pi\sqrt{\text{arrow}]} \\
\text{[C=C=N} \pi\sqrt{\text{head}]} \\
\text{[C=C=N} \pi\sqrt{\text{head}]}_{\text{min/max}} \\
\text{[C=C=N} \pi\sqrt{\text{arrow}]}_{\text{min/max}} \\
\text{[C=C=N} \pi\sqrt{\text{arrow}]}_{\text{min}}
\end{array}
\]
\text{head>arrow (head arrow)}

b. (the)  
\[
\begin{array}{c}
\text{[C=C=N} \pi\sqrt{\text{head}]}_{\text{max}} \\
\text{[C=C=N} \pi\sqrt{\text{arrow}]}_{\text{min/max}} \\
\text{[C=C=N} \pi\sqrt{\text{head}]} \\
\text{[C=C=N} \pi\sqrt{\text{head}]}_{\text{min}} \\
\text{[C=C=N} \pi\sqrt{\text{arrow}]}_{\text{min/max}} \\
\text{[C=C=N} \pi\sqrt{\text{arrow}]}_{\text{min}}
\end{array}
\]
\text{arrow>head (arrow head)}

The compound, in its entirety, is now categorized by its functional context—specifically, as N-equivalent in the context of e.g. D. That categorial equivalence is interpreted presumably not only on the maximal projection, but on the minimal one as well.

When we turn now to the merger of roots with functors, a similar logic applies, but as we shall see, complications emerge as well. Thus consider the merger of \( C_{A[N]} \) to be realized as \( /\pi al/ \), with some root, e.g. \( \pi\sqrt{\text{verb}} \). By the assumptions made thus far, \( C_{A[N]} \) is an instance of A which has N as its CCS, thereby rendering \( \pi\sqrt{\text{verb}} \) N-equivalent. On a par with the derivations in (90a–b), we now expect the configurations in (91a–b):

(91) a.  
\[
\begin{array}{c}
\text{[C=C=N} \pi\sqrt{\text{verb}]}_{\text{min/max}} \\
\text{[C=C=N} \pi\sqrt{\text{verb}]} \\
\text{[C=C=N} \pi\sqrt{\text{verb}]}_{\text{min/max}} \\
\text{[C=C=N} \pi\sqrt{\text{verb}]}_{\text{min}} \\
\text{[C=C=N} \pi\sqrt{\text{verb}]}_{\text{min}} \\
\text{[C=C=N} \pi\sqrt{\text{verb}]}_{\text{min}}
\end{array}
\]
\text{verb>al (verb al)}

b.  
\[
\begin{array}{c}
\text{[C=C=N} \pi\sqrt{\text{verb}]}_{\text{max}} \\
\text{[C=C=N} \pi\sqrt{\text{verb}]}_{\text{min/max}} \\
\text{[C=C=N} \pi\sqrt{\text{verb}]} \\
\text{[C=C=N} \pi\sqrt{\text{verb}]}_{\text{min}} \\
\text{[C=C=N} \pi\sqrt{\text{verb}]}_{\text{min}}
\end{array}
\]
\text{al>verb (al verb)}

(91a) is of course straightforward enough. Not only does the order derive the actual linearization, but \( C_{A[N]} \) projects, likewise as required given its functorial transitive nature. (91b), on the other hand, is not a recognizable part of English. The question,
however, is to what one is to attribute its absence, and specifically, whether the culprit
is somehow the structure in (91b) as such, or alternatively, as we shall see, the fact that
the restrictions on the distribution of /πall/, the realization of a C-functor, are not met.
That the structure in (91b) is itself illicit is a patently untenable claim. Such
structures not only underlie compound structure, but also, quite clearly, the structure
of prefixed forms, where, by common assumptions, it is the “root” that projects,
rather than the affix. For e.g. input and output, then, the plausible derivation would
be as in (92), the direct correlate of (91b), while (93), the presumed correlate of (91a),
gives an output that doesn’t appear to be part of English (bold italics for particles and
prefixes):

(92)  a. (the), (T)  

\[
\begin{array}{c}
\text{[C}=\text{N/V}\sqrt{\text{PUT}]_{\text{max}}}
\end{array}
\]

\[
\begin{array}{c}
\text{[C}\sqrt{\text{PUT}]}
\end{array}
\]

\[
\begin{array}{c}
in_{\text{min/max}}
\end{array}
\]

\[
\begin{array}{c}
\text{out}_{\text{min/max}}
\end{array}
\]

b. (the), (T)  

\[
\begin{array}{c}
\text{[C}=\text{N/V}\sqrt{\text{PUT}]_{\text{max}}}
\end{array}
\]

\[
\begin{array}{c}
\text{[C}\sqrt{\text{PUT}]}
\end{array}
\]

\[
\begin{array}{c}
in_{\text{min/max}}
\end{array}
\]

\[
\begin{array}{c}
\text{out}_{\text{min/max}}
\end{array}
\]

(93) a.  

\[
\begin{array}{c}
\text{[C}\sqrt{\text{PUT}]_{\text{min/max}}}
\end{array}
\]

\[
\begin{array}{c}
in_{\text{min}}
\end{array}
\]

\[
\begin{array}{c}
\text{out}_{\text{min}}
\end{array}
\]

b.  

\[
\begin{array}{c}
\text{[C}\sqrt{\text{PUT}]_{\text{min/max}}}
\end{array}
\]

\[
\begin{array}{c}
in_{\text{min}}
\end{array}
\]

\[
\begin{array}{c}
\text{out}_{\text{min}}
\end{array}
\]

Roeper (1999), in addressing the headedness of complex words, presents compelling
evidence to show that prefixes such as out are prepositional heads, incorporating
into the root and perforce adjoining to the left. In fact, making a stronger claim,
Roeper shows that left adjunction is an inherent and compelling property of complex
words in general. Particularly telling, in this respect, is the fact that left adjunction is
recursive, as in (94a) but “right” adjunction, if that is, indeed, how e.g. (94b) should
be analyzed, never is:

(94)  a. over-re-imbursement; re-over-imbursement

b. *break down out; *break out down; *out break down

If on the right track, then, the reason for the ungrammaticality of (91b) is not
structural, but rather, involves the fact that /πall/ fails to correspond to the realization
of any prefix. Conversely, and insofar as /πall/ corresponds to a C-functor, the
ungrammaticality of (91b) follows from the fact that that functor does not project.
The structure, however, as (92) shows, would allow its left sister to host over or out,
themselves potentially categorically specified constituents and possibly even functors
of a different type (e.g. modifiers). However, it would bar them from projecting. As
non-projecting heads, they could be licit in the configuration in (92), but not in (93).
We note as an aside, and endorsing the assumption that prefixes are instances of
incorporated P-heads, that the system, as sketched here, would force the incorpor-
ated P-heads to be intransitive, i.e. particles, and would block the incorporation of
transitive instances of P. The rationale is clear enough. The incorporation in (92)
could, in principle, conform to Uniformity, but only if the incorporated element is an instance of $P_{\text{min/max}}$. The incorporation of e.g. $in_{\text{min}}$ which is distinct from $in_{\text{max}}$ would give rise to $in_{\text{min/max}}$ post-incorporation and hence in a violation of Uniformity:

\[(95) \quad a. \quad [C=N/V^\pi PUT]_{\text{max}} \quad b. \quad * [C=N/V^\pi PUT]_{\text{max}} \quad in_{\text{min/max}} \quad in_{\text{min/max}} \quad [C=N/V^\pi PUT]_{\text{min}} \quad [C=N/V^\pi PUT]_{\text{min}} \quad in_{\text{min}} \quad XP\]

We note that the result is certainly a desirable one and lends independent support to our structures, insofar as prefixes that actually are recognizable as independent, attested instances of $P$ are, without fail, cases of intransitive particles.  

Returning to the distinction between e.g. $in/out$ and $in/all$, we note that while the latter, in English, is never the realization of a prefix, the converse is not true for $in/out$. Rather $in/out$ as well as other particles can occur at the right periphery, as in break-in, blackout, and so forth. Importantly, and crucially from our perspective, however, in these contexts as well $out$ fails to project. Category, rather, is (by and large) that of $N$, and is clearly not determined by the particle, although for all intents and purposes, it is a “suffix”.

Speculating, suppose the structure of forms such as break-in, blackout, and so on takes as its input in break or out black already formed by the incorporation in (92), to give rise to the additional movement and projection of $[C^\pi \sqrt{\text{break}}]_{\text{min}}$ as in (96). In (96), note, Uniformity is observed and $[C^\pi \sqrt{\text{break}}]_{\text{min}}$ maintains its minimal instantiation:

46 Roeper (1999) argues that prefixal instantiations of e.g. $out$ maintain their (prepositional) argument structure, but not so suffixal instantiation, contrasting, specifically, (ia) with (ib). The facts do not quite bear out the contrast, however, as the grammaticality of both (ia) and (ic) indicates:

(i) a. the outbreak of the disease  
   b. *the handout of good examples  
   c. the breakout of the disease

We note, contra Roeper (1999), that in e.g. hand out a book, a book is not in fact a complement of out, but rather out is an intransitive particle, and so the preservation of argument structure appears altogether not the relevant factor here.

47 A fuller account of English prefixes clearly must also address existence of two, or possibly three English prefixes that are argued to be categorically projecting (de-, en-, be-).

48 Note that forms such as breakout, blackout, etc. are strongly nominal, in contrast e.g. with to input, to output, and even to outbreak which are considerably more amenable to verbal use. The reason, I believe, resides in the Compound Frame Categorization scheme within English primary compounds already briefly touched upon in fn. 9. While fn. 9 noted it in the context of primary compounds, by assumption right-headed, we note that the categorization scheme in actuality is oblivious to the properties of the head, and applies, equally strongly, in the presence of exocentric compounds such as walkman, bluetooth, or greenberet. By assumption, then, it nominalizes the left member of compounds such as breakout, although it is, in some important sense, the head.
Consider now this brief discussion of particles and prefixes in a broader context. The linearization and categorization properties of \textit{prt-pfx} were outlined and derived, but fundamentally, from a certain interaction between principles of categorization and linearization in conjunction with a crucial listed property of \textit{prts-pfxs} such as \textit{out} or \textit{over}—the fact that they are perforce instances of \textit{min/max}, i.e. the fact that they cannot project. Once this assumption is made, their prefixal nature can be derived, as well as their properties when occurring to the right of their host, if care is taken to ensure that they are, across the board, in compliance with Sister First, i.e. they move and are subsequently linearized to the left of their host. Returning to /\textit{pal}/, and to its impossibility in prefixal contexts, this would now follow from the fact that /\textit{pal}/ is the realization of \textit{C}_{\text{N[A]}}, but only if we assume that C-functors, inherently, are instances of (non-maximal) \textit{min}, effectively forcing them to project. But if that is the case, then it follows that they may \textbf{never} move, for any such movement would, by definition, force them to be a maximal, non-projecting instantiation. Combined with the Sister First principle, in turn, this result conspires to exclude them as adjoined to the left of a host.

Suppose we now attempt to summarize the discussion thus far. For compounds, left adjunctions truly seem like the only way to achieve both categorization and linearization. Additional evidence for the dominance of leftward adjunction in complex words comes from the recursive nature of prefixation reported by Roeper (1999). However if prefixes are definitionally instances of \textit{min/max}, and C-functors are, definitionally, instances of non-maximal \textit{min}, then it is clear that the adjunction structures in \((91a)\) cannot be motivated by the need to categorize the structure, as such categorization emerges directly from the intransitive nature of prefixes vs. the obligatorily transitive nature of C-functors. While the movement may have as its side effect the categorization of compounds, its fundamental motivation must reside elsewhere.

Suppose, then, that the movement is motivated by the need to linearize, and that the resulting structural configuration emerges as a result of the combination of the properties of functors and the properties of incorporation. Crucially, note, any such account must subscribe to the view that structures such as those in \((97)\) cannot be linearized as such, though they are categorically unambiguous. We note that if we wish to retain some interaction between asymmetrical c-command and linearization, as per Kayne’s original LCA (1994) proposal, it would need to be defined strictly with respect to terminals and exclude the dominating node, so as to render \textit{A} and \textit{B} in \((97)\) in a symmetrical c-command relationship regardless of projection:
But if A and B in (97) symmetrically c-command each other, then they can only be linearized through incorporation. Such an incorporation could affect the \( \min/\max \) member, if a root or a prefix, forcing it to the left. If affecting the non-maximal \( \min \) member, however (and absent re-projection), it would lead to a violation of Uniformity. If we are on the right track, then, the fundamental reason for the right-headedness of words in English stems from a combination between the fundamentally transitive nature of C-functors, and conditions on linearization.

We note finally that the rationale, as outlined, strongly suggests that linearization cannot be segregated from the syntax, and rather can and should be seen as a driving force in syntactic movement. Crucially, relegating the movement under consideration to the phonology will not do, as such movement is pivotal in at least one syntactic, non-phonological domain—that of categorizing compounds. In compounds, as we saw, the effect of the movement is not only to linearize, but also to determine which member of the compound would project, thereby determining clearly non-phonological aspects of the syntactic derivation potentially ranging over the computation of scope, the computation of modification, and so on. In turn, and insofar as the need to linearize may derive syntactic movement, and insofar as it is at least plausible that linearization considerations may vary across languages, it introduced the distinct possibility that a strict separation between narrow syntax and its interfaces is untenable, and that rather the syntactic component can, and perhaps should, manipulate constituents so as to conform to its medium, the latter, by assumption, a structured gestural system of some kind. The point is made in various forms throughout this book, and see, in particular, section 2 of Chapter 8. Finally, we note that the overall rationale employed here is extremely reminiscent of that outlined in Zubizarreta (1998), where it is similarly argued that movement may be driven by the need to give rise to phrasal stress which is in turn converted to focus interpretation. In this context, see also the important contributions included in Erteschik-Shir and Rochman (2010).

Problems nonetheless remain. As the astute reader may have already observed, the execution of movement utilized in this very work for deriving AS-nominals involves an incorporation structure which violates Uniformity, insofar as \( V \) when incorporating from \( E \) to \( N \), is an instance of a non-maximal \( V^{\min} \) (see section 1 of Chapter 4 as well as section 6.3 above). Even trickier is the fact that the movement to linearize postulated here must affect not only first merge, but all subsequent merges as well. Consider, for instance, \textit{verbalize}. To exclude a linearization such as \textit{ize>verbal}, we would need not only the incorporation in (91a) but that in (98) as well:
Insofar as in (98) movement is required in order to linearize [verbal] and [ize], it suggests that in some important sense, the internal structure of [verbal] becomes opaque and the only level of linearization accessible to (98) is that which involves the symmetrical c-command between $C_{\mathcal{V}[A]}$ and $C_{\mathcal{A}[N]}$ max. The claim, in turn, will turn out to be compatible with an independent claim, to be substantiated in Chapter 10, according to which every C-functor merger does amount to the introduction of a new phase. As the reader will no doubt observe once she gets to Chapter 10, however, matters are unfortunately more intricate, making the clear identification of an unambiguous phase which applies across all domains of rule application a tricky matter whose final resolution must await further research. These are, nonetheless, the considerations that have led, throughout this work, to the favoring of adjunction structures, in the hope that remaining issues of execution will, eventually, be formally workable.49

49 In an interesting recent article, De Belder and van Craenenbroeck (2011) suggest that roots, so called, correspond to a merger with an empty set. Specifically, they emerge from the fact that the first operation of Merge selects only one element of the numeration, thereby forcing it, effectively, to merge with an empty set. The relevant empty node, in turn, is categorized contextually and spelled out post-syntactically. The idea is formally attractive, and predicts directly the occurrence of roots solely as the most deeply embedded terminals. Interestingly enough, to account for a later merger of “roots”, by assumption only possible at first Merge, De Belder and van Craenenbroeck propose a phase-based execution, taking the output of some mergers to constitute a terminal, for the purpose of continuing Merge. The conclusion is clearly reminiscent of the linearization discussion here, where a similar claim may need to be made, raising the possibility that the systems converge in non-trivial ways. It is important to note, nonetheless, that in the system presented here, it could not be maintained that every merger of an empty set, in and of itself, entails a
6.5 Conclusion

The purpose of this chapter has been to make articulate a specific syntactic architecture, within which it is possible to treat the structure of derivatives and the structure of syntactic constituents as following the same general principles. Such an architecture should consist of combinatorial principles, which we took to be those outlined in the Bare Phrase Structure system of Chomsky (1995a) and subsequent work, and which are based, fundamentally, on the formal notion of Merge, involving the asymmetrical combination of two elements, so that the resulting object shares the properties of one, but not the other, of the embedded members of the pair.

Before turning to issues of categorization and phase application, it is worthwhile summarizing the claims made here concerning the initial array which is the input to Merge. My proposal has been that the relevant array consists of functors, on the one hand, and of the total inventory of phonological indices otherwise available in the language, the latter by definition devoid of any syntactic or semantic properties, and specifically devoid of category. In a departure from the specific execution in BPS, however, I assumed that it is possible, at any point, to merge with an empty set, i.e. to create a branching structure with a radically empty node, and where by “radically empty” I refer to the absence of any grammatical and phonological properties or features. Such a radically empty node, in turn, constitutes an open value which must be assigned range, and as a result, is subject to rather strict licensing conditions which severely delimit its syntactic distribution and its semantic interpretation. Insofar as semantic functions are available that can assign range to empty sets, I labeled the carriers of such functions “S-functors”. S-functors, I argued, do not project in themselves—rather, it is the empty node that projects as a labeled generalization over the properties of the S-functors that may assign range to it, and in accordance with a universal hierarchy of functional projections. Alongside S-functors, I also proposed the existence of C-functors—functions that do project and whose main function is syntactic. Much of this chapter was devoted to elaborating on the properties of C-functors by way of establishing not only their existence and their properties, but also the ways in which they are different from S-functors.

In this chapter, as well as in the previous ones, I have been assuming that roots, phonological indices, come to be categorically equivalent as a result of their syntactic context. In Chapter 7, I turn to the details of contextual categorization.

phase, nor would it be possible to consider roots as empty sets in the exact same sense that is utilized within Extended Projections. The first claim, note, would constitute a phase in the middle of an Extended Projection, an undesirable result, and the second would allow range-assigned empty sets, i.e. ExP-segments, as roots, a similarly undesirable result. It might be possible, however, to conceive of roots as empty sets that have not been assigned range at all. For a further comparison and a discussion of the phonological implication of radically “empty” roots, see Chapter 8.
Appendix: English C-Functors—a Methodological Note

At the core of the empirical phenomena under investigation in this book is English so-called derivational morphology, and more specifically, categorizing affixes (mostly, but not all suffixes). While the theoretical claims made are not assumed to be language-specific, nonetheless most case studies do come from English (and see Chapter 1 for the general considerations that underlie the deliberate restriction of the empirical base of this study). English, however, is not the author’s native language, and thus she cannot claim to have any natively valid intuitions concerning the felicity of any one particular complex word. In turn, and as is usually the case, the absence of native intuition has advantages and disadvantages. The latter are self-evident. The former derive from the fact that to the author, any (sufficiently) attested complex word is just as good as any other. The matter, we note, is one that differentiates words from phrases, and touches upon an aspect of language design that remains poorly understood and which was briefly touched upon in Chapter 1 (see especially fn. 6). Although there are many phrasal idioms in English as well as in other languages (and see the appendix to Chapter 9 on phrasal idioms), it nonetheless remains the case that in a typical discourse, the overwhelming majority of syntactic phrases uttered are compositional and formed on the fly.

Although the existence of a generative device of word formation well into adult life is beyond dispute, it nonetheless remains the case that in a typical discourse, the majority of “words” are not spontaneously produced on the fly, but rather are pulled from some listed reservoir. The listed reservoir, or so it seems, is in turn subject to a variety of pressures emerging from social and historical contexts (race, class, gender, jargon, geography, education, and so on), some of them extremely subtle, and resulting, oftentimes, in disjoint preferences. The pair liquefy and liquidize (when transitive and with a synonymous Content) may serve as an illustration here. While liquefy seems to be the much preferred term in the author’s social milieu and is certainly more common, it nonetheless remains the case that liquidize is listed, with the identical Content, in just about every mainstream dictionary. Liquidize also scores a large enough number of Google hits, although still lower than liquefy. It might very well be the case, then, that precisely because the author is somewhat “tone-deaf” when it comes to the difference between liquidize and liquefy, she is perfectly happy to consider both as perfectly licit outputs of the English word-formation system, an effect that a more tuned-in native speaker might overlook.

Quite apart from patterns of favored use, and as any morphologist knows, delving into the reservoir of words in search of generalizations is altogether a precarious enterprise, as fool-proof generalizations are extraordinarily hard to come by. Listedness, lexical listedness included, is after all meant to capture precisely what defies easy generalizations, and all generalizations concerning properties of words are thus quite precious. A fairly common response, within lexicalist approaches (and see, in this respect the rather typical set of objections set out in Newmeyer 2009, as noted in section 2.1 of Chapter 2 and section 3.3 of Chapter 7) is to put forth as a matter of scientific preference a system in which non-rule-governed memorizing is fundamental to the linguistic ability, and where listedness is a primary

50 American Heritage Dictionary; Oxford Dictionaries Online; Macmillan Dictionary; Merriam-Webster Online; Cambridge Advanced Learner; Webster’s New World College 4th edition; Webster’s Revised Unabridged 1913 edition; as well as a myriad of online dictionaries such as Vocabulary.com, Wordnik, Dictionary.com, etc. Google hits for liquidize: 204,000; Google hits for liquefy: 1,180,000.
cognitive device. The theoretical leap here, however, is rather puzzling, and for several reasons. First, the absence of foolproof rule-governed generalizations in the present stage of linguistic research is neither more nor less surprising than the absence of foolproof rule-governed accounts for many a physical phenomenon in Galileo’s lifetime. The point has been repeatedly made and there is little point in rehashing it, beyond saying that it is only through the search for rule-governed generalizations and the construction of consistently improving models that any scientific endeavor may progress. The theoretical leap is even more surprising when we consider the fact that most lexicalist scholars do have a theory, and that theory does utilize rule-governed generalizations. Lodging their theories in the lexicon, in turn, is effectively by way of being an escape hatch. In other words, it is by placing the relevant rule-governed pattern in the lexicon that exceptions somehow can be excused, an absolution device that is barred for syntactic accounts, as the latter, apparently, are expected to live up to a higher standard of rigor, an altogether interesting presupposition on the part of lexicalist work. Finally, and perhaps most crucially, the theoretical leap is surprising because although foolproof generalizations might be hard to come by, generalizations which cover a significant number of the facts are extremely common. To illustrate, the claim that all English AS-nominals are (overtly) derived, challenged by Newmeyer, does clearly have a number of exceptions (see section 3.3 of Chapter 7 for discussion). The question, however, is whether we are justified in taking this handful of cases to mean that no rule or regularity could possibly exist, or should be looked for. According to such an approach, favored by Newmeyer, it is thus the fact that by a huge margin the overwhelming majority of the cases do conform to a single, rule-governed generalization that becomes a puzzling coincidence. To be sure, incomplete generalizations are the hallmark of a rule or possibly a model that is in need of a tune-up. That, however, is the definition of a scientific research agenda, not a reason to give up on the existence of rule-governed generalizations altogether.

This final point brings us to an important methodological matter, all the more important precisely because the author is a non-native speaker of English, and that matter concerns the source of data. Throughout this work, the reader will find claims about words that are attested in English, as well as words that are not attested in English, with the latter, in particular, playing a pivotal role as evidence for the applicability of the constraints offered. The above paragraph already gave some indication of the circumstances under which the author would consider a word to exist, even if non-standard in some context: If the word is listed in a number of mainstream dictionaries with the relevant Content, the author will assume it is attested. If the word occurs with some degree of Content consistency in online publications with a credible source (e.g. texts of published articles, credibly edited journals, online books, legal documents, and so on) the author will assume it is attested. In asserting the existence of (otherwise controversial) words, every effort was made to explicitly document their source, and “(G)”, when accompanying an example, indicates an online source searched through Google (links, however, are omitted. Skeptical readers are invited to google the words themselves). In including, in the relevant sample, uncommon, potentially archaic or obsolete, as well as “esoteric” words, I fully endorse here the rationale articulated in detail in Plag (1999), who notes the following (itself purposefully replete with relevant instantiations, note):

First of all, it is not clear where esoteriness starts and where it ends. What is esoteric for one speaker, may be rather natural for another. But even if one would overcome this
general difficulty... there is a second problem. Unfamiliarity or uncomfortableness with a
certain word is not necessarily an indication of its morphological ill-formedness but can
have a number of causes, with violation of morphological restrictions being only one of
them. Thus, the rejection of esoteric words by a speaker may depend on pragmatic factors,
or be the result of prescriptive rules a speaker applies... In essence, the claim that a
putative word violates a morphological restriction should therefore be based not only on
sound morphological arguments, but also on the prior exclusion of other possibly
intervening factors. Thirdly, and ideally, one would like to have a theory of morphological
competence that can account for everyday words as well as for the esoteric ones. If a
theory can handle both, it is to be preferred over theories that have to exclude esoteric
words from the range of data that they want to explain. (Plag 1999, p. 66)

Non-attested instances are, of course, impossible to search, and yet such cases are crucial to
our discussion. All claims concerning non-attested cases are based on their absence in One
Look Dictionary searches (http://www.onelook.com/). One Look Dictionary is not actually a
dictionary, but rather a word list compiled from some sixty online dictionaries and word lists,
including technical and professional dictionaries, slang dictionaries, lists of proper names and
acronyms, etc. Each listed entry in One Look, in turn, is a link to all its entries in those various
sources. A search for liquefy would, for example, yield the following:

We found 36 dictionaries with English definitions that include the word liquefy:
Click on the first link on a line below to go directly to a page were “liquefy” is defined

General (34 matching dictionaries)

1. liquefy: American Heritage Dictionary of the English Language [home, info]
2. liquefy: Collins English Dictionary [home, info]
3. liquefy: Vocabulary.com [home, info]
4. liquefy: Macmillan Dictionary [home, info]
6. Liquefy, liquefy: Wordnik [home, info]
7. liquefy: Cambridge Advanced Learner’s Dictionary [home, info]
8. Liquefy: Wiktionary [home, info]
9. liquefy: Webster’s New World College Dictionary, 4th Ed. [home, info]
10. liquefy: The Wordsmyth English Dictionary-Thesaurus [home, info]
11. liquefy: Infoplease Dictionary [home, info]
12. Liquefy, liquefy: Dictionary.com [home, info]
13. liquefy: Online Etymology Dictionary [home, info]
14. liquefy: UltraLingua English Dictionary [home, info]
15. liquefy: Cambridge Dictionary of American English [home, info]
16. Liquefy: Wikipedia, the Free Encyclopedia [home, info]
17. Liquefy: Online Plain Text English Dictionary [home, info]
18. liquefy: Webster’s Revised Unabridged, 1913 Edition [home, info]
19. liquefy: Rhymezone [home, info]
20. LIQUEFY: CMU Pronouncing [home, info]
21. liquefy: AllWords.com Multi-Lingual Dictionary [home, info]
22. liquefy: Webster’s 1828 Dictionary [home, info]
23. liquefy: Free Dictionary [home, info]
A search for an “esoteric” form such as e.g. *ejectment* would not in actuality yield much less:

We found 27 dictionaries with English definitions that include the word *ejectment*:

*Click on the first link on a line below to go directly to a page where “ejectment” is defined*

⇒ General (19 matching dictionaries)

1. **ejectment**: American Heritage Dictionary of the English Language [home, info]
2. **ejectment**: Collins English Dictionary [home, info]
4. **Ejectment, ejectment**: Wordnik [home, info]
5. **ejectment**: Webster’s New World College Dictionary, 4th Ed. [home, info]
6. **ejectment**: Infoplease Dictionary [home, info]
7. **ejectment**: Dictionary.com [home, info]
8. **Ejectment**: Wikipedia, the Free Encyclopedia [home, info]
9. **Ejectment**: Online Plain Text English Dictionary [home, info]
10. **ejectment**: Webster’s Revised Unabridged, 1913 Edition [home, info]
11. **Ejectment**: AllWords.com Multi-Lingual Dictionary [home, info]
12. **ejectment**: Webster’s 1828 Dictionary [home, info]
13. **ejectment**: Dict.cc Englisch/Deutsch Wörterbuch [home, info]
14. **Ejectment**: 1911 edition of the Encyclopedia Britannica [home, info]
15. **ejectment**: Free Dictionary [home, info]
16. **ejectment**: Dictionary/thesaurus [home, info]
17. **ejectment**: Online Talking Dictionary [home, info]
18. **EJECTMENT**: Urdu/English Dictionary [home, info]
19. **ejectment**: Eurodict Online [home, info]

⇒ Business (8 matching dictionaries)

20. **ejectment**: Webster’s New World Law Dictionary [home, info]
22. **ejectment**: Everybody’s Legal Dictionary [home, info]
As should be obvious, then, One Look Dictionary is, if anything, a very liberal list, and it is precisely for that reason that I take all forms that are not listed in One Look Dictionary to be non-attested, and hence, by assumption impossible. It is, for instance, the occurrence (or lack thereof) of such forms in One Look Dictionary that has led me to assert (see fn. 35) that there are exactly two de-verbal nouns in English which are verbalized with the prefix be- and nominalized with -al (betrothal, betrayal), and that there are no de-verbal nouns which are verbalized with be-, but nominalized with -(a)tion, as well as myriads of other empirical generalizations claimed, throughout this book, but not always corroborated in detail.
Categorizing Roots

7.1 Categorizing Roots

Roots, I have suggested, are real. Certainly, they are real enough to exhibit phonological consistency across derivations, or to delimit the spellout possibilities of inflectional marking or affixes attached to them. That reality, however, is by assumption exclusively phonological, thereby leading to the claim that what we call “roots” are in actuality simply the inventory of all phonological representations available in a given language (or idiolect).

Roots are linked neither to a function nor to a category, and as I will suggest in Chapters 8 and 9, they are not reliable predictors of Content either. But now, it would appear, we have a bit of a paradox. I argued, rather strenuously, in Chapter 6, section 2.3, that C-functors do not only project a category, but define a CCS as well (a Categorial Complement Space). Consider, from this perspective, the paradigm in (1) already discussed in Chapter 6:

(1) a. formable; sortable; faceable; coastable; primable; palatable
    b. formal; sortal; facial; coastal; primal; palatal

As already noted, if coastal is Content-related to the nominal meaning of coast, but coastable is Content-related to the verbal meaning of coast, and if this effect generalizes over all (compositional) occurrences of -al and -able, then it strongly suggests that -al (or whatever C-functor it instantiates) selects an already nominalized coast, while -able selects an already verbalized one. But if coast is a root, i.e. \( \sqrt{\text{coast}} \), then where could its category possibly come from? In neither one of its occurrences, be it within coastal or within coastable, is it actually marked as belonging to any category.

Within classical accounts of English word formation, it is typically assumed that e.g. -al indeed only attaches to nouns, and that coast, in the context of coastal, is somehow nominal. This is either because it is listed as N to begin with, or because it is derived from some other instantiation of coast, that instantiation being either a non-categorized root or, alternatively, an otherwise listed and categorized instantiation.

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1 We note that, trivially, any word complex or simple and including function words, by virtue of being a phonological representation, could merge as “root”. To the extent that such complex words typically are not used as roots (e.g. in Jabberwocky-type contexts) is presumably due to understandable difficulties in over riding their accepted sense. See Chapter 9, section 2.1 for some more relevant discussion.
(e.g. the listed coast$_v$). Either way, the derivation involves a silent N affix, effectively a phonologically null variant of -ation or -age. Similarly, -able only attaches to verbs, and coast, in the context of coastable, is somehow verbalized by means of a silent V affix attaching either to a non-categorized root or to a listed N entry, or, finally, may be listed as coast$_v$. Such an account, we note, would certainly capture the Content relatedness of coast$_v$ in coastable vs. coast$_N$ in coastal. However, as is immediately evident from our point of view, this solution only serves to push the problem one stem down. -al, from the perspective espoused here, is but a phonological realization of a C-functor, C$_{A[N]}$, projecting A and having an N CCS. Similarly, -able is the phonological instantiation of ABLE$_{A[V]}$. If e.g. π$_{\sqrt{\text{coast}}}$ and π$_{\sqrt{\text{face}}}$ are nominalized by some N which may spell out as phonologically null (call it ∅$_N$), that affix is, definitionally, likewise a C-functor. As a C-functor, it would project N, to be sure, but what is its CCS? Similarly, there would need to be a ∅$_V$, a C-functor projecting V and phonologically null, so as to render coast$_v$, if ABLE must attach to V. What, now, is the CCS of ∅$_V$? Note that, by assumption, both ∅$_V$ and ∅$_N$ must be allowed to attach to uncategorized roots. If our line of logic here is sound, -al and -able have a CCS, which cannot be met, as such, by an uncategorized root. But if so, why should there be such a difference between different C-functors, so that some have a CCS which may not be satisfied by an uncategorized constituent, while others, to wit, ∅$_V$ and ∅$_N$, may, indeed must, have their CCS satisfied by such uncategorized constituents? And if such a difference does exist between C-functors, why should it correlate with the availability, or lack thereof, of phonological representation, across categories, such that ∅ instantiations of both C$_V$ and C$_N$ functors may select roots, but not so overt instantiations?

I return to phonologically null instantiations of C-functors in great detail in sections 7.3 and 7.4, where I argue in detail that English does not have any productive such instantiations, but before doing so, let us consider an alternative, which, as we shall see, has empirical as well as conceptual advantages. I already noted in Chapter 6 section 1.1 that categorial selection, as typically conceived, and like other selection systems, is fundamentally a matching system, and as such has a redundancy built into it by definition. The statements that would be required, for, e.g., coastal (or governmental, for that matter) as well as for will coast or coasted (or will crystallize/crystallized), would be as in (2)–(3) and consist of first stating the categorial selection properties of -al and T (the latter an ExP-segment), and second, of stating independently the categorial properties of their potential complements, however derived (by assumption, note, government is already N and crystallize is already V due to prior operations):

(2) a. -al projects A  b. will-$\ll e, \gg$, projects T, T a segment of {Ex[V]}
-al must merge with N  {Ex[V]} must merge with V

(3) π$_{\sqrt{\text{COAST}}} \rightarrow$ N (somehow)   π$_{\sqrt{\text{COAST}}} \rightarrow$ V (somehow)
[IN[govern]ment]   [V[crystal]ize]
The alternative to such redundancy is to treat the categorial properties of roots just as other syntactic properties are treated in XSM (e.g. argument structure) and assume that they emerge in the context of particular functional structure, and as a result of that structure. More concretely, suppose we understand “categorial selection” to be a statement about defining a complement space and about equivalence classes, a point already briefly made in Chapter 1, section 5.1. By way of illustration, consider an example from the visual domain. Specifically, the collection of black markings in (4a) can be said to define a “complement space” in the most concrete sense of “complement”, i.e. that which is contained within the same overall space and which is not black. The defined white space under consideration crucially has no properties beyond those defined by the black markings, the latter, in turn, inherently well defined. Specifically, it does not have the property BALL, although an object that does have the inherent properties of a BALL, such as the (two-dimensional representation of a) BALL in (4b), could, of course, fit into this space. What could not, however, fit into that space is anything that has inherently defined properties which are incompatible with those of BALL—i.e. the space cannot accommodate a NON-BALL, one instantiation of which is, presumably, the CUBE in (4c). Insofar as we can refer to (4b) as a (representation of a) BALL, we can now think about the space defined by the markings in (4a) as BALL-equivalent. The shape in (4c), however, is neither BALL nor BALL-equivalent:

Returning to the domain of categorial selection, we can now think about C-functors and Extended Projection sets as necessarily defining a complement space with particular properties, such properties in turn contingent on the specific properties of the “selector”, in the same sense that the properties of the complement space defined by (4a) are distinct from the properties of the complement spaces defined by (5a, b):

Specifically, suppose we label the Categorial Complement Space defined by T (≪e≫) as V-equivalent, proceeding to conclude, as follows from the view of Extended Projections outlined in section 3 of Chapter 6, that an identical Categorial Complement Space is defined by all segments of {Ex[V]}, including, at the very least, {≪e≫₁, ≪e≫₂, ≪e≫₃}. Insofar as the complement of {Ex[V]} is V-equivalent, it will exclude anything which is not V-equivalent, but would allow, equally happily, both items which already are V (e.g. crystallize) or items which fail to have any categorial properties altogether, i.e. roots. The statements in (2)–(3) could
now be dispensed with, and replaced with the statements in (6), in turn formally
equivalent, within the terminology used here, to (7):

(6)  a. \(-al\) projects A
     b. \(\text{will} \ll \text{e} \gg \text{T}\) projects T, T a segment of \{Ex[V]\}
     The (Categorial) Complement Space of \(-al\) is N-equivalent.
     The (Categorial) Complement Space of \{Ex[V]\} is V-equivalent.

(7)  a. \(C_{A[N]} \rightarrow /_{\_al}, \text{ic, ousl (default underlined)}\)
     \(C_{A[N]} \rightarrow /_{\_al}, \text{ic, ousl (default underlined)}\)
     \(<\text{WILL} \gg \text{T} \in \{\text{Ex}[V]\}\) \(\rightarrow /_{\_\text{will}}\)

Returning to \(\pi_{\_\text{COAST}}\) and \(\pi_{\_\text{FACE}}\), we may now say that when they merge with
functors which are instantiated as \(/_{\_al}\) or \(/_{\_\text{the/}}\), they are N-equivalent, but when
they merge with functors which are instantiated as \(/_{\_\text{able/}}\) or \(/_{\_\text{will/}}\), they are
V-equivalent. Importantly, roots are not assigned a category, nor does a categorial
conversion operation of any sort take place. Rather, they are N-equivalent or
V-equivalent because the categorial space has been divided by a functor, and
the “space” into which these roots have been “poured” so to speak, defines an N-
or a V-space respectively. In turn, and given the architecture of the system in its
entirety, we expect categorial equivalence to be blind to both spellout factors and to
factors involving mode of range assignment. Specifically, whether, e.g. \(<\text{e} \gg \text{is}\)
assigned range by an abstract S-functor such as PST\(^T\) or an S-functor with its own
index such as WILL\(^T\) or THE\(^D\), or, indeed, external range assignors such as adverbs
of quantification or specifiers, this should not impact the categorial properties of
equivalence sets, which, of course, is clearly a correct result.

Some illustrations of categorial equivalence in distinct contexts are given in
(8)–(9):

(8)  a. \(T\)
     \(\text{WILL}^{\text{T}}\)
     \(<\text{WILL} \gg \text{T} \in \{\text{Ex}[V]\}\) \(\rightarrow \text{will coast}\)

     b. \(T\)
     \(\text{PST}^{\text{T}}\)
     \(<\text{PST} \gg \text{T} \in \{\text{Ex}[V]\}\) \(\rightarrow \text{coasted}\)

     c. \(C_{A[V]} / \text{ABLE}_{A[v]}\)
     \(C_{A[V]} \rightarrow \text{coastable}\)

(9)  d. \(#/\text{Q}\)
     \(<\text{MUCH} \gg \# \in \{\text{Ex}[V]\}\) \(\rightarrow \text{much coast}\)

     e. \(\text{CL}\)
     \(<\text{DIV} \gg \text{CL} \in \{\text{Ex}[V]\}\) \(\rightarrow \text{coasts}\)

     f. \(C_{A[N]}\)
     \(C_{A[N]} \rightarrow \text{coastal}\)
Some consequences of the representations in (8)–(9) are worth pointing out. Note first that all roots are category-equivalent once they have merged with any functor.2 Therefore, although roots have no categorial properties on their own, in most, if not all structural contexts they do acquire categorial equivalence. A second consequence of significance is the fact that although the roots in (8) are all category-equivalent, and although the categories to which they are equivalent may differ from one structure to the next, all instances of category-equivalent roots remain non-branching structures involving a single terminal. Specifically, both $[C=\pi\sqrt{\text{COAST}}]$ and $[C=V\pi\sqrt{\text{COAST}}]$ represent a single, non-branching terminal, and crucially, the emergence of a categorial context for roots has been accomplished without increasing the derivational complexity of these forms relative to some bare root “source” (i.e. without making the categorized form more complex than the root), and without deriving any one categorial instantiation of the root from another. Similarly, note that being in a selecting context (e.g. of -al or -ation) does not add any complexity to, e.g., government or crystallize.

Returning briefly to the structures of AS-nominals and R-nominals, we note now that in the R-nominal configuration in (10), it is $C_{N[V]}$ itself that defines the root it merges with as V-equivalent. For the AS-nominal, in turn, the V-equivalence emerges in the context of $\{\text{Ex}[V]\}$. What incorporates into $C_{N[V]}$ here is a constituent which is already V-equivalent, making this case more akin to that of the derivations in (9).3

2 (Bracketed) roots may merge with (bracketed) roots, to give rise, specifically, to compounds. See Chapter 6, sections 1 and 4 for discussion. See also section 7.3 below for some relevant comments.

3 Note that syntactic operations manipulate labeled constituents and leave behind labeled copies. Thus although $\pi\sqrt{\text{form}}$ may not have a category as such, $[C=V\pi\sqrt{\text{form}}]$, by virtue of being a V-equivalent constituent and manipulated as such, is no longer categorially malleable.

PST, recall, is semantically vacuous which, in turn, translates to the absence of an S-functor and by extension to the absence of a syntactic label. Concretely, I assume that it can be an ExP-segment although in and of itself it cannot either project a category or have a CCS. It therefore follows that if present, it can only be licit if the root, if one exists, is otherwise rendered category-equivalent (by either a C-functor or by a semantically contentful member of the relevant Extended Projection) and the expression as a whole otherwise
I return to the ramifications of this distinction in section 3.4.1 of Chapter 9. For the sake of completeness, however, note that the categorial properties of the structure of governing are identical to those of government. As I argued in some detail in Chapter 4, ING$_{N[v]}$ does not allow the merger of ASP$_Q$. However, for categorizing purposes, the presence of E suffices to render the root V-equivalent in all AS-instantiation cases, and by assumption, ING$_{N[v]}$ comes with a V Complement Space. The structures of governing, as an AS-nominal and as an R-nominal, are thus in (12)–(13):

(12) a. the governing of the people by the government

b. ING$_{N[v]}$ ING$_{N[v]}$

E

$\ll [c=\pi^V \text{GOVERN}]_E$ ING$_{N[v]}$

$\ll [c=\pi^V \text{GOVERN}^3]_E$

(13) a. This kind of governing is bound to lead to an uprising.

The organization of this chapter is as follows. In section 7.2, I compare the account of categorization directly above with competing accounts, including those offered by Chomsky interpreted. It is the latter factor, presumably, that would block F$^{\text{SHL}}$ from being the highest member of any Extended Projection. The matter, however, is largely orthogonal to the main line of discussion here.
(1970), by Lexical Phonology and Morphology as based on Kiparsky (1982a, b), and Distributed Morphology (Marantz 2000 and subsequent). Sections 7.3 and 7.4 complete the picture by mounting a battery of arguments against the existence, in English, of productive zero-realized C-functors, be they \( C_{N[v]} \) or \( C_{v[N]} \). Section 7.5 addresses the issue of C-functors which appear to occur in multiple categorial contexts, and primarily ING. Finally, and having focused primarily on nouns and verbs, section 7.6 is effectively a prolegomenon to the study of adjectives reviewing what conclusions can be drawn concerning their categorial nature from the model articulated here, and where future research might be heading.

7.2 Categorization—Evidence and Competing Accounts

7.2.1 Chomsky (1970)

We note that the model of categorization outlined above is a very simple and straightforward one. In this and the next few sections, I will undertake to compare it to other categorization models so as to highlight its advantages, as well as to provide further evidence for it.

It is appropriate to start our discussion here by highlighting the difference between the contextual notion of categorization I outline directly above, and the contextual categorization presented in Chomsky (1970) (and see also Ouhalla 1991; Picallo 1991; Marantz 1997). Recall that in Chomsky’s account, a category-neutral item, possibly root, is inserted into the syntactic structure, and it is the syntactic structure that determines both its category and its subsequent phonological form. Specifically, DIRECT, by assumption a category-neutral item, when inserted in a verbal context, gives rise to a verb and the subsequent “verbal” instantiation of the item’s properties (e.g. obligatory subject, accusative case). On the other hand, in a nominal context, DIRECT would give rise to a noun and the subsequent “nominal” instantiation of its properties (e.g. optional arguments, of-insertion). The account is conceptually akin to the one presented here, insofar as in both it is context that is responsible for categorial properties, and not the inherent, presumably listed, properties of a terminal. That the accounts are nonetheless vastly different, empirically as well as within other conceptual domains, can be seen when one recalls that for Chomsky, the nominal realization of, e.g., DIRECT is direction (cf. (2) of Chapter 1, section 2 as well as section 1 of Chapter 6 essentially as in (14)):

\[
\begin{align*}
\text{NP} & \quad \text{VP} \\
N & \quad (\text{of NP}) & V & \quad \text{NP} \\
\text{DIRECT} & \to \pi \text{direction/} & \text{DIRECT} & \to \pi \text{direct/} \\
\text{FORM} & \to \pi \text{formation/} & \text{FORM} & \to \pi \text{form/}
\end{align*}
\]

Fundamentally, Chomsky’s approach sets aside morphological complexity as a non-syntactic issue, and the fact that formation as well as direction are bi-morphemic while form and direct are mono-morphemic (prefixing aside) is by assumption syntactically irrelevant. Nor is it relevant (indeed, even acknowledged) that insofar as form is at least morpho-phonologically a subpart of formation, that subpart corresponds to the verbal, rather than the nominal instantiation of form. The notion of what is a basic, non-categorial unit, possibly root, in some sense, is thus very
different from the one put forth here, as is the formal role and architecture of word formation or any notion of relatedness between “words”. It is rather clear that the categorially neutral listed items, as postulated in Chomsky (1970) must carry some phonological content, or the discussion is rendered meaningless. However, morphophonological considerations as such play no role in the analysis.

Roots, as perceived here, are fundamentally devoid of any hierarchical internal structure. On the other hand morphology, or word formation, as perceived here, is fundamentally hierarchical, and hence by assumption syntactic. Equally importantly, the system, across the board, attempts to be mindful of phonological faithfulness and morpho-phonological complexity. Direction and formation, in XSM, cannot possibly be roots, because they are not mono-morphemic, and rather, represent a complex hierarchical structure, at the very minimum that of a (derived) R-nominal, as in (15):

\[
\text{C}_N[v] \rightarrow \text{C}_N[v] \rightarrow [\pi v, \text{DIRECT}] \rightarrow [\pi v, \text{FORM}]
\]

Of course, it follows equally directly in both systems that /π direction/ or /π formation/ cannot instantiate a verbal context. However, the rationale for that is distinct. In Chomsky’s system, /π formation/ is a phonological spellout associated specifically with a nominal context, making its non-occurrence in verbal contexts a straightforward matter. In the system presented here, /π formation/ is the spellout associated with (15), accounting for its absence in verbal contexts equally straightforwardly. Matters, however, do become less straightforward when we consider the fact that π FORM has (at least) two possible nominal instantiations: formation which is morpho-phonologically complex, and form_N which is not, and where the latter, but not the former, is homophonous with the verbal instantiation of the same root (form_V). The ramifications of this matter play a considerable role in the discussion in the remainder of this chapter and in the argument for the contextual notion of categorization outlined here.

7.2.2 Distributed Morphology

Assuming category-less roots and a strict separation between lexical listings and syntactic projections, Marantz (2000 and subsequent work) and the bulk of work within Distributed Morphology propose that categories project as separate categorial nodes (n, v, a—so-called little n, little v, little a). Such categorial nodes are part of the functional inventory of the language, and are subject to Vocabulary Insertion (VI): by assumption a post-syntactic procedure which associates a phonological form with functional terminals. For, e.g., n, such phonological form could be -ation, or -er, or a phonologically null suffix. Importantly, these categorial nodes may also accomplish additional work. Thus it won’t do to postulate just a (little a), because clearly the a that would spell out as /π able/ is distinct from the a that would spellout as /π all/. Effectively, then, categorial labels are functors, complete with both a category and with some additional syntactico-semantic properties, and at least at times, with a unique spellout. Crucially, roots, as such in this system
never have a category. To see that this is the case, consider first the structure in (16). The phonological output for this structure may be either (16i) or (16ii), which, for Distributed Morphology, would have an identical structure, and would only differ from each other insofar as for \( n \), VI would insert -ation in one case, but \( \emptyset \) in the other. Beyond this matter, note that in (16), and regardless of the phonological instantiation of \( n \), \( \sqrt{\text{FORM}} \) (following the DM notation for roots) does not have a category. The category, rather, is associated exclusively with the functional item \( n \):

\[
\begin{align*}
(16) & \\
\sqrt{\text{FORM}} & \downarrow \\
& \rightarrow \text{ i. } \sqrt{n} \text{form/} \\
& \rightarrow \text{ ii. } \sqrt{n} \text{formation/}
\end{align*}
\]

Consider now \( a \), and specifically when instantiated as  /\( \pi \)al/. It could attach to the structure in (17), giving rise to (17i) and (17ii):

\[
\begin{align*}
(17) & \\
\sqrt{\text{FORM}} & \downarrow \\
& \rightarrow \text{ i. } \sqrt{\text{nformal/} \\
& \rightarrow \text{ ii. } \sqrt{\text{nformational/}
\end{align*}
\]

But presumably, \( a-\sqrt{n}\text{al/} \) can also attach to the root \( \sqrt{\text{FORM}} \) directly, giving rise to the structure in (18):

\[
\begin{align*}
(18) & \\
\sqrt{\text{FORM}} & \downarrow \\
& \rightarrow \sqrt{n}\text{formal/}
\end{align*}
\]

In (17), we note, \( a \) is not merging with a root, but rather with an already existing categorial structure which is a projection of \( n \). In turn in (18) it merges with the root. Either way, the root itself is not labeled. Rather, what is labeled is always only the structure dominating it.

The category-less status of roots within syntactic structures is a rather important matter for several reasons. We note, first, that contrary to common perception, e.g., little \( n \) does not assign a category to \( \sqrt{\text{FORM}} \), regardless of whether it is null or not. In (16ii), the constituent \( n \) never corresponds to \( \sqrt{n}\text{form/} \). Its minimal instantiation is \( \sqrt{n}\text{ation/} \) (if phonologically separable) and its maximal instantiation is \( \sqrt{n}\text{formation/} \). Within \( \sqrt{n}\text{formation/} \), the part that spells out as \( \sqrt{n}\text{form/} \), and which is a distinct constituent, remains category-less. A very similar logic holds for (16i) in which the structure is identical, and where the \( \emptyset \)-nature of the affix is syntactically irrelevant—what is \( n \) is never the root itself, but rather its categorial sister or the branching

\[
\text{Note in this context that -ation and } \emptyset_{N} \text{ are not in competition, a situation which is specifically excluded by the competition model of insertion developed in Halle and Marantz (1993). Tacitly, then, such analyses introduce, albeit without acknowledging it, a formal distinction between derivation and inflection, or, alternatively, they amount to excluding zero instantiations from competition. See Chapter 6, section 2.3 for some more discussion of this point.}
\]
consonant that dominates it. Strikingly, then, this is a perspective on the instanti-
ation of roots in syntactic structures radically distinct from that presented in Chomsky (1970), where roots as such are never syntactic objects, and where every “root”, in a syntactic context, is inevitably fully categorized. We also note that the structures in (16)–(18) amount to the introduction of a novel syntactic primitive, with syntactic properties yet to be determined. For example, if indeed category-less roots are syntactic primitives, do they project? Do we expect a Root$^\text{max}$ distinct from Root$^\text{min}$ and the sub-phrasal syntax that such projecting structures might give rise to? Alternatively if roots cannot project and must, effectively, instantaneously merge with a category label (i.e. they are definitionally Root$^{\text{min/max}}$), why should that be?5

No less important, in this context, is the status of the merger of a root with any segment of an Extended Projection. Within Distributed Morphology, this does not seem to happen. Rather, a root must merge with a categorizer before merging with any functional node (in the conventional sense). But why should that be? Why can a root merge directly with $v$, but never with $T$, or $D$? Are these conditions on the distribution of roots? Are these conditions on the distribution of functors? If these are conditions on roots, e.g. the need for roots to instantaneously merge with a category label, what does such a requirement follow from? If, on the other hand, these are conditions on functors, e.g. $T$ selects $v, D$ selects $n$, and so on, and then $n$ or $v$ select the root, do such conditions not amount, effectively, to a surrogate categorization of the root by $T$ or $D$, rendering the presence of an additional $n$ or $v$ categorizer redundant?

When compared with (16)–(18), the account developed here likewise postulates a functor $C_N$ in conjunction with $\pi^\text{form}$, to be spelled out as $/\pi\text{ation}/$. The structure of formation, in the account developed here, is nonetheless different from (16) exactly insofar as $\pi^\text{form}$, as such, is not a syntactic object. The CCS that the $C_N$-functor under consideration defines is V-equivalent, and thus the structure of formation would (minimally) be as in (19) (and see also (8f)), where $/\pi\text{orm}/$ instantiates a V-equivalent constituent. Nor is $C_N[V]$, for example, when realized as $/\pi\text{ation}/$, any different here from the V-defining Extended Projection $[\text{Ex}[V]]$ (providing the latter is taken as a set). $T$ (or $c_e$), as a segment of $[\text{Ex}[V]]$, defines a V-equivalent CCS, and thus any root merging with it is V-equivalent, as already illustrated in the structures in (8).

5 The first approach is pursued by Harley (2009b) who indeed develops a full sub-phrasal syntax for roots (see also Embick 2004, who allows such root projection for some structures). I return to her account in Chapter 12, section 3.1.

At least one of the problems with assuming that roots are syntactic objects that remain uncategorized is the fact that roots never appear to spell out in the absence of a category, a matter already noted in Marantz (1996), to which I return in Chapter 9, section 5.5. However, if uncategorized roots are licit syntactic objects, it is not clear why they should not be able to spell out. The problem, of course, vanishes once it is assumed that all roots, one way or another, become category-equivalent and may spell out as such.
Considerably more crucial, however, are the differing claims concerning the structure of what spells out as \( /_{\pi}form/ \) in (16). In the account under development here, \( /_{\pi}form/ \) is crucially mono-morphemic, insofar as it spells out a single, non-branching terminal. If it is a “noun”, it is because it is embedded in a larger structure that defines it as N-equivalent (e.g. 8d–e). If it is a “verb”, it is because it is embedded in a larger structure that defines a V-equivalent categorial space (e.g. 8a–c). Thus while \( /_{\pi}formation/ \) spells out a bi-morphemic structure consisting of a V-equivalent space and a C-functor, \( /_{\pi}form/ \) is a single terminal, crucially with categorial properties that are determined solely within a larger categorial space, i.e. a more complex syntactic constituent.

But does this really follow, the reader is no doubt wondering at this point? After all, what is to prevent the derivation in (15) from proceeding exactly as it does, with the nominal affix defining a V-equivalent CCS (or any other CCS), but with the affix itself being phonologically unrealized, i.e. \( \emptyset \)? In other words, what, specifically, would block a zero occurrence of \( C_{N[v]} \) along side \( /_{\pi}ation/ \), a zero occurrence of \( C_{A[N]} \) alongside \( /_{\pi}all/ \), and a zero occurrence of \( C_{V[A/N]} \) alongside \( /_{\pi}ize/ \)? Certainly not anything that emerges from contextual categorization as such!

Indeed, zero realizations of C-functors are perfectly compatible with contextual categorizing. The converse, note, is not so. Absent contextual categorizing (and absent any other formal categorizing mechanisms such as “conversion”, zero realizations of C-functors emerge as the only way to derive the categorial properties of otherwise unmarked roots. Likewise, if zero C-functors do not exist, or do not exist productively, the existence of contextual categorizing (again in the absence of any other formal categorizing operations) becomes inevitable.

The following two sections are devoted to detailed argumentation against the existence of zero-realization for English C-functors. Concretely, I will argue that there are, in English, no zero-phonology correlates of -ation or -ize. In the absence of such zero realizations, the structure in (16) could not be assumed to underlie what, eventually, is pronounced as (the) form, and insofar as form does have a nominal instantiation, that instantiation would have to be contextually determined. In turn, and insofar as contextual categorization is inevitable for deriving such nominal instantiations of form, we must doubt the utility of structures such as those in (16) altogether, or, more generally, the assumption that roots never have a category (or are never category-equivalent, to be precise), that categorization is always achieved through the presence of a dedicated categorial node, and by extension, that all category-equivalent constituents are at the very least binary branching and never single terminals.

We note, before proceeding, that insofar as the account to be proposed here will ultimately assign a branching structure to \( formation_N \), but not to \( form_N \), it goes a long
way towards establishing that morpho-phonological complexity and morpho-
syntactic complexity do go hand in hand, a claim that is explicitly or implicitly
denied in most syntactic approaches to the construction of words.

7.3 Against English Zero Categorizers, Part I

7.3.1 Some general considerations

Before I turn to empirical issues concerning the existence (or lack thereof) of zero
instantiations for C-functors, it might be worthwhile to consider the major concep-
tual weakness involving any model relying on productive zero realizations of this
sort—all such models perforce divorce morpho-phonological complexity from mor-
phological, syntactic, or morpho-syntactic complexity. The failure of correlation
works in both directions. As the tree in (16) already showed, a syntactically equally
complex tree may give rise to two morpho-phonological outputs which vary in
complexity, one being morpho-phonologically complex (formation), the other
morpho-phonologically simple (form). Similar disassociation occurs in the other
direction, where a single form, regardless of its morpho-phonological complexity,
may correspond to varying degrees of morpho-syntactic complexity. Note, specifi-
cally, that all circled constituents in (20) would spell out as /n.form/. /n.form/, then, may
correspond to a single syntactic node, as in (18) or (20c, d), or to the merger of two
syntactic nodes, as in (16) or in (20a, b, e). For that matter, it is not clear
that it cannot, in principle, correspond to three or four, as in (20h, i). Nor is
the problem limited to morpho-phonologically simple constituents. Formal may be
bi-morphemic, as in (20c), or tri-morphemic, as in (20e), etc. In turn, once morpho-
phonological complexity is divorced from (morpho-)syntactic complexity, the result
is not only multiple possible trees for a single morpho-phonological representation,
or multiple morpho-phonological representations for a single tree, but also the
wholesale elimination of any empirically sound and non-circular methods of correl-
ating derivations with structural complexity.7

6 The claim here is specifically about zero realizations of C-functors, i.e., functors which project a
category and which have a CCS, and where, as we shall see, the proliferation of postulated zero realizations
is particularly troubling. While a typological universal along such lines might emerge from a deeper
scrutiny, the author is certainly not in a position to assert its existence. Nor is there an attempt, at this
point, to extend the claim to the presence, if indeed warranted, of zero realizations for, e.g., CAUSE in
representations such as break.CAUSE∅ or to the English middle construction (books sell well), although it
is the author’s belief, quite independently, that neither one of these requires any zero-realized affixation.
Importantly, the claim explicitly does not carry over to S-functors or to realizational marking, or
S-marking, which emerges as a result of an abstract S-functor and the re-merger/re-projection movement
by a head through the ExP-ladder, as outlined in Chapter 1, section 5.2 as well as in Chapter 6, section 3.
Recall, in this context, that neither S-functors nor S-marking give rise to word-internal complex structure.
S-functors, by assumption, do not “incorporate” into stems, and “inflection” is definitionally a name for
non-morphemic realization which emerges as a result of S-marking.

7 Specific illustrations of non-falsifiability, both within Distributive Morphology and within Kiparsky’s
(1982a, 1997) system will be pointed out as we proceed.
(20) a. PST
   PST
   \[v_\emptyset\]
   \[v_\emptyset\]
   \[\sqrt{\text{FORM}}\]

   b. DEF
   DEF
   \[n_\emptyset\]
   \[v_\emptyset\]
   \[\sqrt{\text{FORM}}\]

   c. \[v_\text{ize}\]
   \[n_\emptyset\]
   \[a_\text{al}\]
   \[\sqrt{\text{FORM}}\]

   d. DEF
   DEF
   \[n_\text{ation}\]
   \[v_\emptyset\]
   \[\sqrt{\text{FORM}}\]

   e. \[v_\text{ize}\]
   \[a_\text{al}\]
   \[n_\emptyset\]
   \[\sqrt{\text{FORM}}\]

   f. (*)
   DEF
   DEF
   \[n_\text{ation}\]
   \[v_\emptyset\]
   \[\sqrt{\text{FORM}}\]

   h. \[a_\text{al}\]
   \[n_\emptyset\]
   \[n_\emptyset\]
   \[\sqrt{\text{FORM}}\]

   i. \[v_\emptyset\]
   \[n_\emptyset\]
   \[\sqrt{\text{FORM}}\]

As it turns out, the difficulties associated with zero instantiations of C-functors (henceforth “zero categorizers”) go well beyond the formal domain, and serious empirical problems emerge as well. Some empirical problems for Distributed Morphology as well as for Lexical Phonology and Morphology are reviewed in the remainder of this section. Section 7.4 is devoted to a detailed rebuttal of the arguments for zero categorizers put forward in Kiparsky (1982a, 1997).

7.3.2 Zero categorizers: the problem of distributional restrictions

Consider now the phonologically unmarked noun–verb alternations in (21). These include cases in which one might want to consider the “basic” concept an “object” as well as cases in which one might want to consider the “basic” concept an “action”:

(21) the salute to salute  
the form to form  
the chair to chair  
the floor to floor  
the lamp to lamp  
the dance to dance  
the kiss to kiss  
the run to run  
the walk to walk  
the feed to feed  
the show to show
Certainly, on the basis of the paradigm in (21), one would want to conclude that noun–verb alternations in English are extremely productive. The question now is how such alternation is to be represented. In most morphological accounts, the assumption has been that one of these forms is the basic one, and that the other one is derived from it by zero-affixation (see, for instance, Lexical Phonology and Morphology of Kiparsky 1982a, 1997). To illustrate, the noun walk is derived from the verb walk, having the representation in (22a), while the verb chair is derived from the noun chair, having the structure in (22b):

\[(22)\]

a. \([v\text{walk]} [n[v\text{walk}] \emptyset_n]\]

b. \([n\text{chair}] [v[n\text{chair}] \emptyset_v]\]

The representations in (22) involve a number of important assumptions. First, they presuppose the existence of a listed basic form with a categorial label, from which other categorially marked forms may be derived. Second, they assume the existence of (at least) two null categorial suffixes—a nominal one attaching to verbs, and a verbal one attaching to nouns. Finally, they subscribe to the view that, e.g., /πwalk/ may correspond to both a mono-morphemic and a bi-morphemic structure.

Within Distributed Morphology, the relevant representations would be as in (23a–b), with the Vocabulary Item corresponding to \(n\) and \(v\), being \(\emptyset\) in both cases (notated as a subscript):

\[(23)\]

a. \([n[^\sqrt{\text{WALK}}]\emptyset_n] [v[^\sqrt{\text{WALK}}]\emptyset_v]\]

b. \([n[^\sqrt{\text{CHAIR}}]\emptyset_n] [v[^\sqrt{\text{CHAIR}}]\emptyset_v]\]

The representations in (23) likewise involve a number of important assumptions. One of these assumptions is shared across both accounts—both assume the existence of phonologically null categorizers in English, i.e., the zero equivalents of /italize/ and /ation/. In other respects, however, the underlying assumptions are very different. First, (23) presupposes the non-existence of basic forms listed with a categorial label. Rather, the basic form is a root which is devoid of a syntactic category. Second, there is no derivational relationship between the nominal and the verbal instantiations—one of them is derived from the other. Rather, both are derived directly from the root. And finally, as a result of the previous two assumptions, the verbal and the nominal instantiations do not differ in their degree of derivational complexity—in its simplest, /πwalk/ corresponds to a bi-morphemic structure in both its nominal and its verbal instantiation.

Finally, the XSM account for (21) would be as in (24), with D standing in for \{Ex[N]\}, a nominal Extended Projection with an N-equivalent CCS, and T standing for \{Ex[V]\}, defining a V-equivalent CCS:

\[(24)\]

a. \([D [c_N \pi[^\sqrt{\text{WALK}}]] [T [c_V \pi[^\sqrt{\text{WALK}}]]]\]

b. \([D [c_N \pi[^\sqrt{\text{CHAIR}}]] [T [c_V \pi[^\sqrt{\text{CHAIR}}]]]\]

The representations in (24), like those in (23), deny the presence of a basic categorially marked form, as well as any direct derivational relationship between the verbal and the nominal instantiation in either direction. As in (23), the
assumption is that both variants are related directly to a root, and that whatever relationship exists between them stems from the fact that they are derived from the same root. Like the representations in (23), then, they do not postulate differing levels of morphological complexity for the verbal and nominal instantiations. However, (24) differs from (23) in two important ways. First, in (24) for example, the verbal instantiations of /πwalk/ and /πchair/ are not accomplished through the merger of an additional verbal head, eventually to be realized as phonologically null. Secondly, and relatedly, both instantiations of /πwalk/ and /πchair/ in (24) are non-branching terminals and thus mono-morphemic syntactically as well as morpho-phonologically.

The table in (25) might be useful in comparing the assumptions across these three approaches:

<table>
<thead>
<tr>
<th></th>
<th>LPM</th>
<th>DM</th>
<th>XSM</th>
</tr>
</thead>
<tbody>
<tr>
<td>one categorial instantiation basic, the other derived from it</td>
<td>yes</td>
<td>no</td>
<td>no</td>
</tr>
<tr>
<td>both forms “derived” from a category-less root</td>
<td>no</td>
<td>yes</td>
<td>yes</td>
</tr>
<tr>
<td>both forms are mono-morphemic</td>
<td>no</td>
<td>no</td>
<td>yes</td>
</tr>
<tr>
<td>both forms are bi-morphemic (at least)</td>
<td>no</td>
<td>yes</td>
<td>no</td>
</tr>
<tr>
<td>zero categorizers</td>
<td>yes</td>
<td>yes</td>
<td>no</td>
</tr>
<tr>
<td>contextual categorizing</td>
<td>no</td>
<td>no</td>
<td>yes</td>
</tr>
</tbody>
</table>

With this exposition in mind, consider now the ungrammatical cases in (26b) and (27a):

(26) a. *a salutation          b. to salutation
    a formation                 *to formation
    an arrival                  *to arrival
    a partnership               *to partnership
    a neighborhood              *to neighborhood
    a writer                    *to writer
    the kindness                *to kindness
    the ability                 *to ability

(27) a. *a crystallize          b. to crystallize
    *an instantiate            to instantiate
    *an acidify                to acidify
    *an encase                  to encase
    *a fatten                   to fatten
    *a bemoan                   to bemoan
    *an enlighten               to enlighten

From the sample of cases in (26)–(27), as compared to those in (21), a tentative generalization emerges: phonologically unmarked categorial noun–verb alternations in English appear impossible for morphological derivatives.

A further consideration of the facts, however, results in the conclusion that the restriction cannot involve derivational complexity as such. The primary compounds in (28) are indeed excluded as verbs, but not so the primary compounds in (29), which are, presumably, derivationally complex as well:
In turn, note that the compounds in (28) are themselves headed by a nominal derivative, while the compounds in (29) are headed by a form that is itself (morpho-phonologically) mono-morphemic, plausibly a root, which in turn may have both nominal and verbal instantiations. Differently put, the compounds in (29) are headed by forms otherwise belonging to the (21) group. The generalization that thus emerges does not concern the derivational complexity of the forms in (26)–(27) as such. Rather, what appears to make a difference is the presence vs. absence of an actual overt categorizer such as -ation, -ize, -en, -hood, etc. Specifically, we may state the generalization as in (30):

(30) Categorially marked forms in English may not undergo an unmarked noun–verb alternation.8

It is worth noting in this context that in a study of English ∅-denominal verbs, and of some 1,300 cases of unmarked noun–verb alternations (and excluding instruments), Clark and Clark (1979) found exactly six cases in which the alternation involved an overt C-functor. The six forms are in (31). With the exception of blockade, they are uniformly rejected by native speakers. Concerning blockade, on the other hand, we note that its properties tally with those of proposition and audition, in refusing an ANnominal context, thus behaving, in this respect, like the underived siege, and not like the derived blockading/sieging. I return to this matter in section 7.4.4:

(31) a. to tourist; to launderette; to laundress; to lover; to allowance; to blockade

(32) a. The blockade of Gaza port (*by Israel) (*for five years) (*in order to oppress the population)
   b. The siege of Gaza port (*by Israel) (*for five years) (*in order to oppress the population)
   c. The blockading/sieging of Gaza port (by Israel) (for five years) (in order to defeat Hamas)

8 The presence of pairs such as a portion/to portion; a condition/to condition; a structure/to structure and others appears to cast doubt on the generalization in (30). I take up this matter directly in section 7.4.4.
A slightly higher number was found among instrumentals, where out of 127 instances, eleven were derived with a $C_N$, but nonetheless allowed a verbal occurrence, including to computer, to glider, and to elevator, and we may add to sprinkler. We note that these, too, are of questionable felicity, and that even if more acceptable, remain a very small portion of the vocabulary.9

Consider now how this generalization could be handled by our three systems, and in particular within systems which assume the existence of zero categorizers. Consider, first, the system presented in Kiparsky (1982a, 1997), according to which all unmarked noun–verb alternations are mediated through the directional derivation of nouns from verbs or verbs from nouns. In view of this, and harking back to the representations in (22), it is extremely difficult to see how the ungrammatical cases in (26)–(28) can be ruled out. To exemplify, it is very hard to see why (22a) is licit, but not so (33’a–c). By the same token, it is very hard to see why (22b) is licit, but not so (34’c–d); and finally, why the forms in (29) are licit, presumably with the structures in (34’a–b), but not so the forms in (28), effectively with the identical structure, as in (33’a–b):

(33) a. [v [N acid] ify]
   b. [N [v arrive] al]
   c. [N [a absurd] ity]

(34) a. [N[wall] paper]
   b. [N[a black] board]
   c. [N[ticket] conductor]
   d. [N[student] fellowship]

(33’) a. *[v[N [N acid] ify] Σ_N]
   b. *[v[N [v arrive] al] Σ_v]
   c. *[v[N [a absurd] ity] Σ_v]

(34’) a. *[v[N [wall] paper] Σ_v]
   b. *[v[N[a black] board] Σ_v]
   c. *[v[N[ticket] conductor] Σ_v]
   d. *[v[N[student] fellowship] Σ_v]

We note that at least some affixation combinations would be excluded in Lexical Phonology and Morphology by level mismatches. More specifically, Kiparsky (1982a, 1997) assumes that the $Σ_N$ attaching to verbs is a Level I affix. Thus if -en is a Level II affix, as seems plausible, the absence of *the fatten follows from a level mismatch. Similarly, possibly, for *the encase, under the assumption that the categorial en$_V$-prefix is Level II. Level mismatch, however, cannot rule out any of the cases involving

9 From a different perspective, and specifically seeking to classify all derivational morphemes as category-less roots, De Belder (2011) claims that of 143 Dutch categorizers, 20% (29) are associated with two distinct categories. From the perspective of proponents of zero categorizers, we note, such a situation could be construed as evidence for a zero categorizer, converting one of these categories to another, and hence a counter-example to the claim that zero categorizers do not attach to derived forms.

A closer investigation of the facts, however, reveals that they do not support the claim, and hence, by extension, cannot also be construed as lending support to zero categorizers attaching to derived forms. I return to this matter in section 7.5, where the claim that what we call here C-functors are in actuality roots, as made by Lowenstamm (2010) and by De Belder (2011), is reviewed in greater detail.
a putative $∅_v$, by assumption a Level II affix, when attaching to derived nouns, or cases in which a putative $∅_N$ is attaching to Level I verbal affixes such as -ify or -ate (and with the level status of -ize independently problematic: see Chapter 9 for some discussion). Even more clearly, there is no obvious reason why $∅_v$, always a Level II affix, can attach to the compounds in (29), but not so to the compounds in (28) and where, by assumption, primary compounds are a Level II formation.

The Distributed Morphology representations in (23) do not fare any better. Crucially, for Distributed Morphology, as for Lexical Phonology and Morphology, the syntax which underlies /πacidify/ and the verbal instantiation of /πform/ is identical, with the difference between them reducing to the choice of Vocabulary Items for $v$. Similarly, the syntax underlying /πformation/ and /πform/ (when $N$) is identical, with the difference between them reducing to the choice of Vocabulary Items for $n$.

We note, crucially, that insofar as both form and formation are derived by $n$ merger with the root, and given the fact that both are licit, competition, as such, could not account for the presence of to form vs. the absence of to formation. It is further unclear why under any structure assigned to compounds, those in (29) should allow a merger with $v$ ultimately to spell out as $∅$, but not so those in (28): 10

\[ (35) \]

\[ \begin{align*}
A & \quad B \\
\text{a. } [v[\sqrt{\text{CRYSTAL}}]v(\text{ize})] & \quad *[v[n[v[\sqrt{\text{CROP}}]v(\text{ize})]]n(∅)] \\
\text{b. } [n[v[\sqrt{\text{GOVERN}}]n(\text{ment})]] & \quad *[v[n[v[\sqrt{\text{GOVERN}}]n(\text{ment})]a(\text{al})]v(∅)] \\
\text{C} & \quad *[v[n[v[\sqrt{\text{GOVERN}}]n(\text{ment})]a(\text{al})]v(∅)]
\end{align*} \]

But suppose we assume that there are no zero instantiations for English C-functors. Considering again the relationship postulated by LPM or by DM between the verbal and the nominal instantiations of, e.g., /πwall/ and /πchair/, as in (22)–(23), in the absence of zero categorizers, none of these derivations could proceed as stated. Within XSM, however, an interesting contrast emerges between, e.g., /πformation/ and /πform/ (in its nominalized instantiation). In both cases,

10 A sole account of primary compounds within Distributed Morphology is available in Harley (2009b), where the structure proposed is as in (i), and where, presumably, a verbal structure underlying to wallpaper would involve the additional merger of a zero instantiated $v$ node. We note that as per the text discussion, it is entirely unclear why wallpaper should have a verbal instantiation, but not so ticket conductor or city neighborhood.

\[ (i) \quad [n∅[\sqrt{\text{WALL}}]√\text{PAPER}] \rightarrow [\sqrt{\text{PAPER}} - n∅[\sqrt{\text{WALL}}]√\text{PAPER}] \]

Note that the structure proposed by Harley also allows for the projection of roots. I return to some aspects of Harley’s analysis of compounds in Chapter 12, section 3.1.
the root \( \pi_{\text{ FORM}} \) is rendered categorically equivalent contextually. In both cases, the “categorized” root \( \pi_{\text{ FORM}} \) spells out identically (stress notwithstanding) as /\( \pi \) form/. In /\( \pi \) formation/, however, the structure corresponding to /\( \pi \) form/ is V-equivalent. In contrast, in /\( \pi \) form/ it is N-equivalent. Specifically, and in the absence of zero categorizers, all instantiations of /\( \pi \) form/ must be categorized through some other means, and specifically by some concrete functor. The derivations of both forms are as in (36) (and with D standing for any segment of \{Ex[N]\}):

\[
(36) \quad \begin{align*}
\text{a.} & \quad \text{D} \quad \text{[D,C=V \( \pi \) FORM]} \\
\text{b.} & \quad \text{C}[N[V] \quad \text{[C=V \( \pi \) FORM]} \\
\text{C}[N[V] \quad \text{[C=V \( \pi \) FORM]} \\
\text{C}[N[V] \quad \text{[C=V \( \pi \) FORM]}
\end{align*}
\]

With these illustrations in mind, note that accounting for the patterns in (26)–(28) is now a straightforward matter. Consider the forms in (21). None is derived, and all are mono-morphemic. Differently put, no C-functors are present. Rather, these are cases very much like (36b), with a root embedded directly under some ExP-segment and thus rendered categorically equivalent to the functor’s CCS. A, the, or three, by assumption instantiations of some segment of \{Ex[N]\}, would thus render roots such as \( \pi_{\text{salute}} \), \( \pi_{\text{jump}} \), or \( \pi_{\text{floor}} \) N-equivalent. Will, infinitival to, or past tense marking, all instantiations of segments of \{Ex[V]\}, will all equally successfully render roots such as \( \pi_{\text{dance}} \), \( \pi_{\text{floor}} \), and \( \pi_{\text{lamp}} \) V-equivalent, thereby deriving the alternation. Such an alternation is possible for the forms in (21), however, precisely because a root has no inherent category, and can thus in principle be categorically equivalent to any CCS. This, however, is not the case for the forms in (26)–(27), which are all categorically marked already. Salutation already is an N, by virtue of being headed by \( C[N[v] \) to be spelled out as /\( \pi \)ation/; encase already is a V, headed by \( C[V[N/A] \) to spell out as /\( \pi \)en-/ etc. In these cases, the roots \( \pi_{\text{salute}} \) and \( \pi_{\text{case}} \), having already merged with a C-functor, have already been rendered C-equivalent, and are now embedded within a larger constituent. It thus follows directly that if phonologically unmarked noun–verb alternations are never mediated by affixation, but rather are the occurrence of roots in distinct equivalence classes, then it follows that, e.g., acidify cannot be an instantiation of a noun, quite simply because, if embedded under, e.g., D, it would need to be N-equivalent. As such, the ungrammaticality of acidify as N is exactly on a par with its ungrammaticality if embedded, e.g., under /\( \pi \)ity/, by assumption an instantiation of \( C[N[A] \) (offensive categorial clash enboxed and highlighted):

\[11\] And see section 4 of Chapter 6 on the adjunction structure in (36).
Acidify could, of course, merge with some instance of C, providing that N defines a V CCS, i.e., C_N[V]. However, in the absence of phonologically null instantiations for such functors, the presence of such a functor would be phonologically detectible. The result is, of course, licit, giving rise to acidification as well as to acidifying, both with a straightforward structure.

A similar account is readily available for the compounds in (28) once we consider the fact that it is the head of the compound, rather than the compound as a whole, that is categorially crucial. Because, e.g., \(\pi\) stand is a root devoid of category, it is equally comfortable within a V-equivalent and an N-equivalent context, giving rise to both a nominal and a verbal instantiation of grandstand. Because conductor and fellowship are nouns headed by the (phonologically overt) C_N functors SHIP_N[N] and ER_N[V], spelling out as /or/ and /hip/ respectively, embedding student fellowship or ticket conductor in a V-equivalent context would result in a clash and in ungrammaticality, as (38) illustrates.\(^{12}\)

Concluding this particular argument, note that the challenge here for proponents of zero categorizers is to explain why it is that such categorizers systematically fail to merge with overt affixes. There are, most certainly, restrictions on the co-occurrence of affixes that must be captured within any approach and which, presumably, could be stated within any of the approaches so far outlined. In fact, within the system outlined here, one could argue that as zero affixes are not default, they must be root selected, thereby accounting for their distribution (and see Chapter 6, section 2 for the relevant discussion). Such root-specific selection, however, flies in the face of the fact that zero affixes, of both the nominal and the verbal variety, seem to be “selected” by just about every English (non-prefixed) root. In turn, and as in, e.g., Kiparsky (1982a), one might propose that they do attach to other zero-affixes. This, however, makes matters worse, insofar as allowing zero categorizers to merge with other affixes, but only provided they are themselves null, does not only compound the mystery, but also makes the matter rather difficult to test empirically (and see, in this context, the discussion of the diagrams in (20)).

\(^{12}\) Although not necessarily damaging to the argument here, some care was nonetheless taken to avoid examples of verbalized compounds which could be argued to emerge from the back formation of synthetic compounds (e.g. to hand shake). See Chapter 12, section 6 for some discussion of synthetic compounds and “back formation”. I am further setting aside here issues concerning the categorization of the non-head in compounds, but see Chapter 6, sections 1 and 4 for intermittent discussion.
7.3.3  Zero categorizers: the problem of de-verbal nominals

As already noted briefly in Chapters 2 and 4, Grimshaw (1990) observes that nominals (by her assumption) ∅-derived from verbs, in English, are largely excluded as AS-nominals. We also noted that while the generalization does have its exceptions (cf.(39)), these pale in comparison with the overwhelming validity of the claim for a huge, productive class of nouns with invariant verbal correlates, which are systematically barred as AS-nominals (see (40) for a small subset of the relevant nouns, and (41) for the illustration that they cannot be AS-nominals):13

(39)  change (and exchange); release; use (and misuse, abuse); murder; discharge; endeavor; consent; resolve; descent (and ascent); decline; collapse; rape.

(40)  (an) admit; (an) arrest; bite(s); (a) break; cause(es); (a) chase; climb(s); export(s); (a) fall; (a) float; (a) follow-up; (a) frown; (much) hate; (the) hold; (every) import; (a) jump; (a) kill; (some) kiss; (a) laugh; (the) lick; (a) lie down; lift(s); (a) listen; (a) look; (little) love; (a) make; (some) mock; (a) move; (every) raid; (a) ride; (a) rise; (a) raise; (a) rock; (a) roll; run(s); (a) scream; (a) sit-in; (a) smile; (a) smoke;

13 The list in (39) includes all valid cases cited in Harley (2009b) as well as in Newmeyer (2009), with the latter author claiming the existence of “literally dozens” of such cases (see fn. 14 of Chapter 4 as well as appendix to Chapter 6 for a previous note of this objection). Newmeyer (2009) does recognize that “the majority—perhaps the large majority—of AS-nominals are morphologically complex”, but attributes this to historical reasons. The rationale, however, is less than clear. If historically AS-nominals were derived overtly from verbs, would that mean that historically, English grammar was constrained so as to only allow AS-nominals that are derived from verbs, and zero-categorizers were absent? And if so, what conspired to make Modern English grammar so deviant?

Notwithstanding the cases in (39) both Harley and Newmeyer fail to note that the main problem is not accounting for the presence of AS-nominal properties in a handful of cases in which the nominalizer is not clearly realized—these can be easily integrated into the system by means of exceptional realization information associated with roots (and see directly below for some suggestions). The problem, rather, is accounting for the complete absence of AS-nominal properties for the nouns in (40), in spite of the fact that many of them denote a (simple) event, and have Content which is extremely event-friendly. Contrary to what could be expected, given both Newmeyer’s approach and that outlined in Harley (2009b), the properties of the nouns in (40) are predictable, productive, and systematic, and insofar as novel N/V pairs enter the language regularly, none of the nouns has the properties of the cases in (39). The wholesale listing of nominals with their properties, as Newmeyer suggests, would thus be accomplished at the expense of any hope of capturing the generalization which underlies the properties of the nouns in (40). As outlined directly below, Harley’s account, which would be postulating a zero-instantiated n for both (39) and (40), faces a similar challenge, in failing to offer any insight into the exclusion of the forms in (40) as AS-nominals.

Note now that the majority of the forms in (40) are non-Latinate, and with few exceptions, Latinate forms do not exhibit such a free zero-marked noun-verb alternations. The few exceptions rather regularly exhibit stress retraction, to wit, import, export, prôgress, prôcès, all impossible as AS-nominals:

i.  a. *The import/export of cheap goods in order to undermine unions
b. *The prócess (of the forms) in order to speed the application
c. *The prógress of the negotiations for three weeks

In contrast, and although almost all unmarked AS-nominals in (39) are Latinate, they do not exhibit stress shift. At least one possible account, then, would postulate in such cases a suffix whose overt segmental representation may have been omitted, but which nonetheless is either auto-segmental, or alternatively phonologically robust enough to block stress shift, and as such is certainly different from whatever process gives rise to import or próces. If on the right track, it would signal the availability, for a handful of mostly Latinate roots, of a highly marked categorizing affix which is phonologically real enough, although perhaps not strictly segmental, and which is not available for the roots in (40) or, for that matter, in any derived contexts and for the bulk of Latinate roots as well. For some discussion of root selection, see Chapter 6 section 2.5. For discussion of stress shift in cases such as prôgress–prôgrés, see section 7.4.3. For some general comments on exceptions in morphology, see the appendix to Chapter 6.
(a) stand; (a) take; (a) talk; (a) think; (a) touch; (a) turn; (a) twist; (a) view; (a) walk; (a) whisper; ... (and see throughout for many more examples)

(41) *the walk of the dog for three hours
  *the dance of the fairy for a whole evening
  *the (gradual) fall of the trees for two hours/in two minutes
  *the salute of the officers by the subordinates
  *the import of goods from China in order to bypass ecological regulations

We note, in augmenting the solidity of Grimshaw’s original observation, that the absence of AS-nominal instantiation for the nouns in (40) is in actuality extremely surprising, given the fact that most of these nouns maintain an extremely close Content relationship with their corresponding verbal instantiation, and the fact that most of them can, indeed sometimes must, denote a (simple) event (cf. 42)—all factors which would seem to encourage an AS-nominal formation; but the latter is, nonetheless, almost without exception barred. For completeness, it is of course not the case that AS-nominals based on the same root are barred. Rather, they are readily available with overt nominal affixation (ING, across the board, as well as ATK, ation and kin, where available):

(42) the walk/dance/kiss/salute/touch/view/smoke/scream/roll lasted several hours
  the arrest/bite/fall/raid/talk/kill/sit in/turn/smile took place at 5am

(43) the walking of the dog for three hours
  the dancing of the fairy for a whole evening
  the (gradual) falling of the trees for two hours (multiple events)
  the saluting of the officers by the subordinates
  the viewing of the results by the visiting committee

(44) the importation of goods from China in order to bypass ecological regulations
  the salutation of the officers by their subordinates

In Chapters 3–5 I argued in some detail that AS-nominals must include verbal structure. I further argued (see Chapters 4–5) that this was the case for both ING AS-nominals and for ATK AS-nominals. In view of this, consider what would be necessary in order to exclude the occurrence of the nominals in (40) as AS-nominals. A schematic structure of (Long) AS-nominals is given in (45):

(45)

As is clear from the structure of (45), whether the circled \( C_{N[v]} \) spells out as /\( _n \)ation/ to give rise to /\( _n \)transmission/ or as /\( _n \)al/ (\( /\( _n \)transmittal/ \)) or /\( _n \)ance/ (\( /\( _n \)transmittance/ \))
plays no role in the syntactic derivation. Specifically, the syntactic structure underlying all these phonological instantiations is identical. I also argued for an extremely similar structure for nominals derived with ING\textsubscript{N[V]} to give rise to /\textit{transmitting}/, although ING\textsubscript{N[V]} has a semantic function that differentiates it from C\textsubscript{N[V]}, the latter to spell out as some member of the ATK set. From our present perspective what is crucial is that none of the relevant properties of AS-nominals follow from the spellout properties of the circled C-functor in (45), or, for that matter, from whether it is phonologically overt or not. We also note that the realization of C\textsubscript{N[V]} can certainly be root-selected, as in the case of /\textit{ance}/ and /\textit{all}/. Zero realizations, nonetheless, are by and large excluded. What emerges, then, is that should it turn out to be the case that C\textsubscript{N[V]} in AS-nominals fundamentally corresponds to an overt phonological instantiation, the reason for that requirement could not be reduced to the structure of (45). What is patently clear, however, is that in English grammars with productive zero categorizers, the need actually to exclude the nouns in (40) as AS-nominals remains an outstanding problem, plaguing, at the very least, the analyses in Kiparsky (1982a, 1997), in Marantz (1997, 2010), and in Harley (2009a, b), as well as Chomsky’s (1970) original execution.

Consider first the account offered by Kiparsky (1982a, 1997). In Kiparsky’s system, deverbal \textit{∅ N} attaches at Level I, but so do, at the very least, nominalizers such as -\textit{ation N}, -\textit{al N}, and -\textit{ance N}.\textsuperscript{14} This fact in and of itself, then, cannot be somehow used to derive the absence of an AS-nominal reading of nominals zero-derived from verbs. On the other hand, denominal \textit{∅ V} attaches at Level II. If all cases in (40) were cases of verbs derived from nouns, and, crucially, if one maintains the generalization that AS-nominals must be derived from verbs, then the exclusion of zero AS-nominals could follow. Specifically, in such cases, verbalizing of a listed noun would take place at Level II, with the consequence that subsequent nominalizing could only be available with Level II nominalizers, e.g. -\textit{ing}, but not with \textit{∅ N}, and nor, for that matter, with -\textit{ation}, -\textit{al}, or -\textit{ance/ence}:

\begin{equation}
(46) \begin{align*}
\text{[N\textsubscript{Pass}]} & \rightarrow \text{[V\textsubscript{N\textsubscript{Pass}}]} \Delta \text{ V} \rightarrow ^* \text{[N\textsubscript{V\textsubscript{Pass}}] N} \\Delta \text{ N} \\
\text{affix} & \rightarrow \text{affix} \\
\text{listed form} & \rightarrow \text{Level II} \rightarrow \text{Level I}
\end{align*}
\end{equation}

Of course, the immediate problem for such an account would be the fact that the forms in (40) do not bar “zero” nominalization (if such exists) across the board—they only bar it in the context of AS-nominals. If, indeed, all of these are derived verbs, then across the board one would have to assume that the basic form is a nominal one, and that e.g. \textit{walk}, \textit{hate}, or \textit{think} are all cases in which the verbal instantiation derives from the nominal one. It is hard to see, in fact, that in a system such as this the language could afford any underived verbs, with the possible exception, of course, of \textit{endeavor}, \textit{consent}, and similar, as in (39), which would thus stand as the sole class of underived verbs in English, thereby allowing zero nominalization. To this rather

\textsuperscript{14} The status of -\textit{ment}, like that of -\textit{ize}, is unclear insofar as it displays mixed level diagnostics. See Chapter 9, sections 2.3 and 4 for some discussion.
implausible consequence, we should add the fact that at least some of the forms under consideration do allow nominalization with {-ation} (e.g. salute, form, import, export), and hence must already be verbs at Level I, raising anew the question of why, at least in these cases, $\emptyset_N$ suffixation couldn’t give rise to AS-nominals. Finally, we note that the claim that all unmarked noun–verb alternations in English are cases of verbs derived from nouns comes extremely close to arguing that there is, indeed, a root, but, contrary to the claim advanced here or in Distributed Morphology, it is nominal in nature (and on this claim, see specifically Hale and Keyser 1993, as well as Acquaviva 2009, 2011).

Turning now to Chomsky (1970) (as well as Marantz 1997), we note that as by assumption in these executions the morpho-phonological complexity of root instantiations in distinct categorial contexts is syntactically irrelevant, whether a root spells out as form or as formation in a nominal context cannot be expected to give rise to any syntactically meaningful results, making any statement of the actual difference impossible.

Within executions which involve the merger of roots with categorial labels and which do allow such categorial labels to be phonologically null, excluding form as an AS-nominal but including formation, or, for that matter, excluding run but including running, cannot be accomplished. Ignoring potentially intermediate functional nodes or matters of execution otherwise orthogonal to the main issue under discussion, (47) is, as far as I can see, an exhaustive list of all possible root-categorizer combinations that may yield a derived nominal (and where aff is a theory neutral reference to a phonologically overt affixal realization):15

(47)  
a. Nouns derived from verbs  
\[
\begin{array}{ccc}
N & V & [\sqrt{\text{ROOT}}] \\
\emptyset_N & \emptyset_V & \emptyset \\
\emptyset & \emptyset_V & \emptyset \\
aff & aff & aff \\
\end{array}
\]
b. Nouns derived from roots  
\[
\begin{array}{ccc}
N & [\sqrt{\text{ROOT}}] \\
\emptyset_N & \emptyset \\
\emptyset & \emptyset \\
aff & aff \\
\end{array}
\]

None of these representations predicts syntactic differences based on the phonological realization of affixes as overt or null. If one subscribes to the view that AS-nominals must be derived from verbs, then the structures in (47b) would, presumably, be excluded as AS-nominals. This, however, would only yield the exclusion of the nouns in (40) as AS-nominals with the added assumption that $n$ may only spell out as $\emptyset$ when it merges with roots but not when it merges with

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15 The text criticism applies to any execution which subscribes to the existence of zero categorial labels as well as the claim that AS-nominals must have an internal verbal structure. Marantz (2000, 2010) and Embick (2010) specifically deny the claim that nominals marked with ATK include verbal projections, a matter I already discussed and critiqued in some detail in Chapter 6, sections 2 and 3. As a result, some aspects of the discussion are not directly applicable to that execution, although, of course, the verb-less approach to AS-nominals was independently found wanting, insofar as verb-less executions fail to capture the great similarity between AS-ATK nominals and AS-ING nominals, a matter discussed in Chapter 4, and they fail to account for the fact that AS-ATK nominals always have a concrete verbal source, a matter already noted in Chapters 2 and 6, (and see Chapter 9, sections 1 and 3 for some additional comments).
v, whether v∅ or vaff. Alternatively, it would require the assumption that n∅ may not merge with any affix, thereby ruling out all such representations in (47a) and reducing the problem to the one already noted in section 7.3.2. Either way, it is clear that the only potential solution would involve some special statement about phonologically null categorial nodes, contingent not on their syntax, but on their phonology, thereby setting them apart from phonologically overt categorial labels, and raising the obvious question concerning their usefulness and their theoretical cost. We add, in this context, that proposing that zero categorizers may only merge with roots makes it that much more pivotal to justify their existence, insofar as, by assumption, they could only merge where contextual categorization would otherwise be available.16

An XSM execution, by comparison, yields an immediate, straightforward account for the failure of the nouns in (40) to function as AS-nominals, facing neither the problems of LPM, nor the problems faced by DM. Absent productive zero categorizers, the massive unmarked noun–verb alternation in English, we suggested, emerges from contextual categorization, which allows category-less roots to merge with some ExP-segment and thus become, effectively, category-equivalent in that structural context. The nouns in (40), then, have the structure of the nominal instantiations of /πwalk/ and /πchair/ in (24), with the root rendered N-equivalent in the context of an [EX[N]] Extended Projection:

(48) a. [D the [C=N admit]]
   b. *[much [C=N love]]
   c. [G raid-s [C=N raid]]

If AS-nominals must include a verbal structure, and if, furthermore, English lacks productive null categorizers, the exclusion of the nouns in (40) as AS-nominals follows straightforwardly from the fact that they do not contain a verbal projection. Rather, they are roots in a nominalizing context, with no additional structural complexity. They are, in other words, truly mono-morphemic, and whatever

16 Marantz (1997 and subsequent) as well as Embick (2010) specifically argue that the only possible realization of n merger with v is ing thereby excluding, in principle, all cases of n∅ in (47a). As a correlate, all non-ing realizations of n are to a root, and not to v. Some problems with that approach were already reviewed in great detail in Chapter 4 as well as in Chapter 6, and see also remainder of this chapter. Evidence for that claim is sometimes adduced from the putative contrast between the licit nominal rise vs. the (purportedly) illicit nominal instantiation *raise. Specifically, if nominalizing v requires realization as ing, we expect rise, below v but not raise, by assumption the nominalized form of the causative in (i):

   i. Mary raised her hand/my salary

   The claim is, at best, puzzling. First, raise most certainly is attested as a licit noun, and while it has a narrower Content range than that associated with raising, it clearly does correspond, closely enough, to ‘cause to rise’, and specifically of compensation. Secondly, neither rise nor raise are licit AS-nominals, making the issue altogether moot:

   ii. a. *the (frequent) rise of the sun in five minutes/for five minutes
       b. *the (frequent) rise of prices in five months/for five month
   iii. *the raise of the salaries/the objection in five minutes/for five months

   In turn, and insofar as both rise and raise are licit nouns, but illicit AS-nominals, they fall squarely within the class of cases in (40), thus receiving a direct explanation through the absence of zero-categorizers within any domain.
relationship they hold to their verbal counterparts is mediated through the existence of a common root, and not through direct derivational relationship.

A mono-morphemic verbal constituent, in turn, can only emerge from a root in V-equivalent contexts. Such contexts are either a verbal Extended Projection, \{Ex[V]\}, or a V CCS of some C-functor. In turn, event structure nodes, and specifically E and ASP, are ExP-segments of \{Ex[V]\}. It thus emerges that the presence of argument structure entails the existence of \{Ex[V]\} (or \{Ex[A]\}) for de-adjectival derived nominals. The existence of \{Ex[V]\}, in turn, entails the existence of a V-equivalent constituent. It therefore emerges that AS-nominals must have a V-equivalent constituent embedded within them. It follows, equally strongly, that such a V-equivalent constituent must be nominalized in order for a derived AS-nominal to emerge. In the absence of \(\emptyset\) realizations for such nominalizers, the forms in (40) cannot possibly be AS-nominals. If embedded under event structure, the result would be as in (49), rendering them verbs. Any subsequent nominalization, however, must now be overt, allowing formation or forming, but summarily excluding form:

\[
(49) \quad [\pi V FORM] - ATK \\
\]

In the absence of zero categorizers, then, overt affixation is necessary to turn nouns into verbs and vice versa. The roots \(\pi V ADMIT\) or \(\pi V TABLE\) could, of course, serve as a basis for AS-nominals, providing they are embedded within the appropriate structure. If we embed either of them under functional event structure \{Ex[V]\}, they would be “verbalized” and event structure would be available, giving rise to \(\pi_\text{tabled}\) or \(\pi_\text{to admit}\). If we then proceed to merge the relevant structure with a C_{NS[V]}, an AS-nominal would indeed emerge, to be pronounced, ultimately, as \(\pi_\text{tabling}, \pi_\text{admitting}, \pi_\text{admission}\), or for that matter as \(\pi_\text{admittance}\). Not, however, as either \(\pi_\text{admit}\) or \(\pi_\text{table}\).

7.3.4 Growth revisited

We are now in a position to finally shed some light on the puzzling properties of growth, noted, but left unexplained, in Chapters 2 and 4. Recall, specifically, that the paradigm under consideration is that in (50)–(52):

\[
(50) \quad a. \quad \text{The farmer grew the tomatoes.} \\
  \quad b. \quad \text{The tomatoes grew.} \\
\]

\[
(51) \quad a. \quad \text{the growing of the tomatoes [transitive and intransitive reading]} \\
  \quad b. \quad \text{the farmer’s growing of the tomatoes} \\
  \quad c. \quad \text{the growing of the tomatoes by the farmer} \\
\]

\[
(52) \quad a. \quad \text{the growth of tomatoes [intransitive reading only]} \\
  \quad b. \quad *\text{the farmer’s growth of tomatoes} \\
  \quad c. \quad *\text{the growth of tomatoes by the farmer} \\
\]

Recall now that Marantz (1997, 1999), following Chomsky (1970), suggests that the ungrammaticality of the transitive variants of growth in (52) derives from the fact that
roots in general and √GROW in particular only select a single (internal) argument, giving rise, perforce, only to the intransitive variant. With the exception of /n ing/, recall, all other nominal instantiations are spellouts of n merging directly with a root. Under the assumption that /n th/ is one such spellout of n, it emerges that growth can only be the spellout associated specifically with n+√GROW, and is thus, perforce, intransitive. Transitive variants, in turn, are always complex and involve an external argument assigned by some flavor of v, e.g. CAUSE. In turn, the complex constituent [v CAUSE+√GROW] can likewise merge with n. When n merges with v, however, it spells out as /n ing/. It thus emerges that transitive instantiations of nominalized grow may only occur with /n ing/, and never with any other nominal spellout, and that all other nominal spellouts, including zero, must be intransitive.

The analysis does, however, encounter a problem when one considers the fully grammatical and rather common cases in (53)–(54), where, by assumption, we have a nominalization of a root, but a transitive reading is available nonetheless:

(53)  a. the destruction of the city
      b. the enemy’s destruction of the city
      c. the destruction of the city by the enemy

(54)  a. the formation of the city [ambiguous]
      b. the government’s formation of the committee
      c. the formation of the committee by the government

To accommodate (53)–(54), Marantz assumes, very much along the lines of Grimshaw’s (1990) analysis for similar structures, that the enemy’s in (53) or the government’s in (54) are possessors rather than arguments, and as such may have a free interpretation, including one that happens to coincide with that of an Agent. Such a rescuing device is not available for growth, however, because the lexical semantics of √GROW requires an External Causer (in the sense of Levin and Rappaport-Hovav 1995), and not an Agent, and an External Causer interpretation may only be licensed through a dedicated v node. We note, for completeness, that for the account to generalize to (52c), it must be assumed that not only possessors but by-phrases as well may be interpreted as Agents, but not as External Causers.17

As it turns out, however, the properties of growth do not generalize. Harley and Noyer (1998a), investigating precisely this issue, cite the examples in (55)–(57), in which an External Causer interpretation is available alongside an intransitive derivation for non-ING AS-nominals, in contrast with (52). (58) provides yet another example of such a case:

(55)  a. Kim’s accumulation of dust
      b. the accumulation of dust [ambiguous]
      c. the accumulation of dust by Kim

17 By appealing to the lexical semantics of √GROW to exclude (52b), Marantz effectively resurrects a lexical semantics for listed items which determines not only their internal argument, but their external argument as well.
(56) a. the government’s unification of the city
   b. the unification of the city [ambiguous]
   c. the unification of the city by the government

(57) a. Robin’s separation of Kim and Pat
   b. the separation of Kim and Pat [ambiguous]
   c. the separation of Kim and Pat by Robin

(58) a. the scientists’ formation of a complex molecule
   b. the formation of a complex molecule [ambiguous]
   c. the formation of a complex molecule by the scientists

Nor does the restriction generalize cross-linguistically. Thus in Hebrew, transitive
*grow* and intransitive *grow* are clearly related to the same root, although they are
morpho-phonologically distinct and have a distinct derived nominal. No problems
whatsoever are associated with the transitive form, as (59) shows. Nor is the transitive
nominal barred in any way for pairs such as *yicur-hivaccrut* (‘formation’ transitive
and intransitive), *haprada-hipardut* (‘separation’ transitive and intransitive), *cbira-
hicţabbrut* (‘accumulation’ transitive and intransitive), and others:18

(59) a. giddul _ ha.ikarim _ ‘et _ ha.ţagbaniyot
     grow.TRANS+N the.farmers OM the.tomatoes
     b. giddul _ ha.ţagbaniyot _ (ţal ye.dey ha.ikarim)
     grow.TRANS+N the.tomatoes (by the.farmers)
     c. gdilat _ ha.ţagvaniyot
     grow.INTRANS+N the.tomatoes

18 The Short (b) variety of (59) is stylistically preferable to the Long (a) variety, although both are
transitive. The preference, in turn, seems contingent on the specific morpho-phonological form of the
nominal, and is independent of Agent or External Causer construal. Thus *giddul* shares the Short
preference with, e.g., *biššul* ‘cook-N’ and *πicub* ‘design-N’, but not with *haprada* ‘separate-N’, *hagbala*
‘limit-N’, or *‘apija* ‘bake-N’ (and see Chapter 11 for a brief additional discussion of this point). Hebrew
*giddel*, transitive *‘grow’*, does share with English transitive *grow* the absence of the ‘make-big’ reading,
observed by Pesetsky (1995). However, the same root, ”√gdl*, in a different morphological pattern in
Hebrew, *higdil*, means exclusively ‘make-big’ (as oppose to ‘cultivate’). It, too, nominalizes freely.

Pesetsky’s specific account for the properties of *growth*, predicated on the properties of ∅-affixation,
is further extended to account for the absence of a transitive reading for *annoyance* and similar nominals
derived from psych-predicates. That account, I believe, suffers from the opposite problem from Marantz’s
account for the behavior of *growth*, where the relevant behavior is predicted to be a language universal, but
in actuality is language-specific. Thus while Pesetsky predicts correctly the language-specific nature of the
restrictions on *growth*, insofar as it involves language-specific realization for CAUSE, he also predicts the
restrictions on psych-predicates to be language-specific, and yet these do generalize to Hebrew, where there
is no reason to assume the intervention of ∅-affixation. Thus in Hebrew, transitive nominalizations which
are equivalent to *annoyance* are ungrammatical as well with a psychological interpretation, though licit
otherwise, although, as in the case of *growth*, no ∅-affix could be assumed as the transitive forms and the
intransitive forms, while based on the same root, are nonetheless morpho-phonologically distinct:

(i) a. _hirgiz_ annoy.TRANS (object with both Patient and Experiencer readings)
    b. _hitragez_ be-annoyed.INTRANS

(ii) a. _hargaza_ N annoyance.TRANS (Agent/Patient only)
    b. _hitragazut_ N annoyance.INTRANS
It is, of course, possible to conclude that all Hebrew nominalizations are cases of ING, although, we note, if ING nominals are perforce, as Marantz suggests, AS-nominals, that would deprive us of an account for the fact that R-nominals are certainly attested in Hebrew, or, as we shall see in Chapter 11, of any possibility of offering an account for non-compositional Content in de-verbal nominals in Hebrew. Considerably more seriously, and stepping away from the particular properties of growth, recall that very considerable argumentation was summoned in this work to support the claim that the distinction between AS-ING nominals and AS-ATK nominals does not involve \( \nu \) vs. root attachment of \( n \), and that the structures of AS-ATK nominals and AS-ING nominals are sufficiently similar to make any such radical structural distinction unwarranted. What is called for, indeed, is an explanation for the exceptionality of growth, rather than an account which generalizes from its properties, thereby making wrong predictions for a broad range of derived nominals.

Suppose, then, that growth is not in actuality the spellout of a bona fide derived nominal. Rather, let us assume that \( n_{\text{growth}} \) and \( n_{\text{grow}} \) are stem allomorphs. Differently put, they are slightly distinct spellouts of the very same root in distinct syntactic contexts. As such, they would be displaying a behavior very much akin to that otherwise attested by \( n_{\text{destroy}}-\text{destruct}(\text{ion}) \), \( n_{\text{prógress}}-\text{progréss} \), \( n_{\text{perceive- percept}} \), etc. We do not have here, in other words, an incremental derivational process, but rather the selection of a particular choice of realization provided by a single phonological entry for distinct syntactic environments, giving rise to \( n_{\text{growth}} \) in the context of \( [\text{C=N}n\sqrt{\text{grow}}] \), but \( n_{\text{grow}} \) in the context of \( [\text{C=V}n\sqrt{\text{grow}}] \). Similarly, \( n_{\text{percept}} \) would be the spellout associated with \( [\text{C=N}per\sqrt{\text{ceive}}] \), but \( [\text{C=V}per\sqrt{\text{ceive}}] \) would correspond to \( n_{\text{perceive}} \).

In turn, and if indeed \( n_{\text{growth}} \) is an alternative spellout of a root in an N-equivalent context, then what we expect, by way of its properties, is exactly those which are otherwise associated with roots in N-equivalent contexts. Specifically, it cannot be an AS-nominal, as it cannot contain an event complex, by assumption a “verbalizer”. In turn, and as noted in section 7.3.3, N-equivalent roots may, and indeed often do, have a Content associated with a simple event nominal, which, of course, is true of GROWTH, making it, in that sense, rather akin to, e.g., MOVE, TWIST, or STRETCH. An understood participant, typically a subject/possessor of sorts, is not necessarily barred, as the expressions in (60) illustrate. The nominals, however, cannot be interpreted transitively, and they do not allow aspectual event modification, rationale clauses, or by-phrases. Rather, all modification or rationale, if provided, requires the addition of a separate verbal constituent:

\[
(60) \quad \begin{align*}
&\text{a. the walk of the dog } \{\text{lasted two hours/*for two hours}\} \\
&\text{b. the turn of the screw } \{\text{occurred instantaneously/*for several seconds}\} \\
&\text{c. the view of the mountains } \{\text{lasted all morning/*for several hours}\} \\
&\text{d. the dance of the fairies } \{\text{in order to seduce the traveler}\}
\end{align*}
\]

The properties of growth coincide exactly with those of such N-equivalent roots, including, we note, the infelicity of aspectual modifiers, in striking contrast with both intransitive growing and with the intransitive variants in (55)–(58):
(61)  a. The growth of the fungus/our profits lasted several months.
    b. the growth of the fungus/our profits (??for several months/??in several months)
    c. the growing of the fungus/our profits for several months

(62)  a. the accumulation of dust for/in seven years [intransitive]
    b. the unification of the city in three days [intransitive]
    c. the separation of Kim and Pat in two hours [intransitive]

Finally, it turns out that independent morpho-phonological evidence is available to support the claim that /πth/ is not a spellout of a nominalizer, but rather an alternative root spellout. Specifically, consider the distribution of /πth/-ending nominals in English which correspond to an actual attested potential source noun or adjective (i.e. excluding bath or tenth). The exhaustive list is in (63):

(63)  a. ~verbs: (birth), breath, death, growth, stealth, health, (weight), (sight), (flight), (fright)
    b. ~adjectives: width, length, strength, warmth, truth, breadth, dearth, depth, worth, (youth), (height), (drought)
    c. ~synchronically obscure: wealth, sloth, girth, greenth, coolth

The list, we note, even when supplemented with /πght/ endings, is extremely limited, and riddled with major stem changes, on the whole quite atypical in English derivational processes. Nor are there any other nominal C-functors in English which allow both V and A as CCS. All these factors in themselves already suggest that the alternation here is of a very different nature from that which negotiates the relationship between roots and other instantiations of C N. More direct evidence for the allomorphic status of the forms in (63) emerges, however, when we consider the forms in (64):19

(64)  lengthen, strengthen, heighten

As is well known, C V[A] may be realized as /πen/, as in (65a). As is further well established, such a realization is not licit when C V[A] merges with sonorant-final stems, thereby rendering the forms in (65b–c) illicit:

(65)  a. redder; blacker; thicker; fatter; shorten; etc.
    b. *greener; *thinner; *bluer; *yellower; *brownen; etc.
    c. *longer; *higher; *strongen

19 With thanks to S. Anderson (p.c.) for pointing out to me the relevance of this alternation. D. Pesetsky (p.c.) notes the absence of the forms in (ib), although -en attachment is likewise barred (cf. ia), suggesting, therefore, that the allomorphic choice is, indeed, root conditioned and cannot be presumed purely phonological:

(i)  a. *warmen; *dearen; *truen;
    b. *warmthen; *dearthen; *truthen

See section 7.6 for some general discussion on adjectives that bears on this account.
With the restrictions on \( \pi_{en} \) in mind, suppose we consider again the cases in (64). While the cases in (65c) clearly are illicit because \( \pi_{en} \) attaches to a sonorant, this is not the case in (64), where the relevant stem ends with an obstruent. Effectively, then, \( C_{V[A]} \) may attach to long, strong, and high, because an alternate phonological realization is available for the same stem, or root, which is obstruent final, i.e. \( \pi_{\text{length}}; \text{strength}; \text{height} \). Precisely because no such alternate realization is available for, e.g., thin and blue, and because, or so it would appear, there are no alternative spellouts for \( C_{V[A]} \) that would otherwise be licit in this context, any attempt to embed thin or blue within a verbal predicate would require a light verb. Precisely because an alternative spellout is available for long, strong, and high, a synthetic form is possible, giving rise to the verbs in (64).

Consider, however, the syntactic ramifications of this conclusion. \( \pi_{en} \), we note, is a spellout of \( C_{V[A]} \), a C-functor that projects V and that takes A as its CSS. Within the phonological constraints imposed by \( \pi_{en} \) on its complement, it is extremely productive and gives rise to a fully compositional Content.20 There is little reason to believe that \( \pi_{en} \) is a realization of V–N merger, or that the C-functor under consideration ever renders its complement N-equivalent. An analysis whereby such a merger with N is taking place in (64) is thus highly questionable. All the more so as the trigger for the merger with the purported N is phonological, rather than syntactic. Within a model that subscribes to a late spellout of functors, under any execution, it is not even clear how such a correlation between the phonological restriction on \( \pi_{en} \) and the category of its complement can be stated.21 A direct solution is available, of course, if we assume that \( \pi_{\text{length}}; \text{strength}; \text{height} \) are not instances of N, but rather alternative realizations of the very same otherwise category-less roots which in other contexts spell out as \( \pi_{\text{long}}; \text{strong}; \text{high} \). But if that is the case, then we must discard the assumption that \( \pi_{\text{th}} \) in these contexts is a realization of a nominalizer, and rather allow it to be part of a root allomorph. By extension, there is little reason to assume that \( \pi_{\text{th}} \) is a root allomorph in (64), but the spellout of a nominalizer in (63).

---

20 It is typically assumed that \( C_{V[A]} \) cannot spell out as \( \pi_{en} \) when attached to stems longer than two syllables. The restriction, we note, is not easy to distinguish from one which requires \( \pi_{en} \) realization to be root-selected and hence local (see Chapter 6, section 2.5 as well as section 7.3.5 below). The matter is not pursued further here, but see section 7.6 for some brief comments in the context of the category of adjectives.

21 In hearten, note, \( \pi_{en} \) does spell out a V merged with N, thereby at least prima facie weakening the claim that the same is not the case for, e.g., lengthen or heighten. The problem, however, is only apparent. Note, specifically, that the Content of hearten is highly non-compositional (in fact, it does not even correspond to hearty+en), while in all other cases, and phonological restrictions notwithstanding, the Content of \( C_{V[A]} \) when spelling out as \( \pi_{en} \) is highly compositional, not only with weaken, widen, flatten, but equally strongly with high+en, long+en, and strong+en. Hearten, furthermore, is an isolated case, while \( \pi_{en} \) attachment to adjectives is otherwise very productive. It thus emerges that treating \( \pi_{\text{lengthen}}; \pi_{\text{heighten}} \), and \( \pi_{\text{strengthen}} \) as closer to \( \pi_{\text{hearten}} \) than to \( \pi_{\text{widen}}; \pi_{\text{flatten}}; \pi_{\text{weaken}} \), etc. would constitute an attempt to reduce the regular to the idiosyncratic, clearly the wrong move.

Note, finally, the existence of \( \pi_{\text{frighten}} \). While fright certainly does have an N-distribution, we also note that the only adjective that is plausibly morpho-phonologically related to fright, afraid, is itself complex. Afraid, in turn, does not allow any affixation (*afraidness, *afraidly, *afraiden). We note further that frighten, unlike hearten, does have compositional Content, very much along the typical lines associated with other occurrences of \( \pi_{en} \). I will thus assume without further discussion the existence of a root with two allomorphs, \( \pi_{\text{frighten}} \) and \( \pi_{\text{fraiden}} \), the latter attested exclusively as a bound form.
Considerably more explanatory would be the claim that -th variants are root allomorphs selected in nominal contexts, as well as in some contexts which favor them phonologically for independent reasons. Differently put, roots such as \( \pi \sqrt{\text{strong}} \), \( \pi \sqrt{\text{long}} \), \( \pi \sqrt{\text{grow}} \), and \( \pi \sqrt{\text{die}} \) have two allomorphs: /\_\pi \text{long}/, /\_\pi \text{strong}/, /\_\pi \text{grow}/, /\_\pi \text{die}/, and so on. As is true in typical cases of allomorphic variation, the specific choice of realization is contingent on syntactic and phonological factors. Syntactically, the allomorphic choice is conditioned by an N context, where the /\_\pi \text{length}; strength; growth; death/ realization is favored. Phonologically, it is conditioned by whatever restrictions apply to the spellout of functors (or Vocabulary Insertion, in the terminology of Distributed Morphology), giving rise to /\_\pi \text{length}; strength;/ in contexts that otherwise bar what appears to be the default allomorphs, /\_\pi \text{long}/ and /\_\pi \text{strong}/.

It thus emerges that according to any account, /\_\pi \text{th}/ cannot be the realization of a discreet terminal distinct from a root. Returning to the issue of growth, then, two possible structural alternatives are available concerning its structure, as given in (66). According to one of these alternatives, depicted in (66a), the root \( \pi \sqrt{\text{grow}} \) is rendered N-equivalent by its context, and proceeds to be realized as /\_\pi \text{growth}/. The structure is thus mono-morphemic, and an AS-nominal interpretation and diagnostics are not expected. According to the alternative approach, depicted in (66b), \( n \) would need to merge with \( \pi \sqrt{\text{grow}} \), thereby giving rise to a nominal structure. The \( n \) itself is a zero nominalizer and has no phonological realization as such. In the context of \( n \), however, the root \( \pi \sqrt{\text{grow}} \) would be realized as /\_\pi \text{growth}/. Under this structure, growth would be expected to share the properties of e.g. accumulation and separation, as already noted:

\begin{align*}
(66) & \quad \text{(the) growth: } [d\_n \text{ the } [c=n \pi \sqrt{\text{grow}}]] \\
& \quad \rightarrow /\_\pi \text{growth}/ \\
\text{a. (the) growth: } & \quad [d\_n \text{ the } [c=n \pi \sqrt{\text{grow}}]] \\
& \quad \rightarrow /\_\pi \text{growth}/ \\
\text{b. (the) growth: } & \quad [d\_n \text{ the } [n \pi \sqrt{\text{grow}}]] \\
& \quad \rightarrow \emptyset /\_\pi \text{growth}/
\end{align*}

The choice between (66a) and (66b) as well as the explanatory force of the grow/growth paradigm now reduces to the desirability, or lack thereof, of zero categorizers, already discussed in sections 7.3.1–7.3.3, and to be further discussed in the remainder of this chapter. Insofar as alternative (66a) accounts directly for the properties of growth by equating it with, e.g., the nominal instantiations of jump or turn, rather than by equating it with destruction or accumulation, it is not only empirically advantageous, but it also avoids the need to postulate semantic conditions on roots, a move that altogether weakens the claim that they are devoid of grammatical properties.

Structures associated with the realizations /\_\pi \text{long}/ and /\_\pi \text{length}/ are provided in (67) for the sake of completeness:

\begin{align*}
(67) & \quad \text{(very) long: } [\_\text{DEG[A]} \text{ very } [c=a \pi \sqrt{\text{long}}]] \\
& \quad \rightarrow \text{(very) /\_\pi \text{long}/} \\
\text{b. lengthen: } & \quad [\_\text{VA} [c=a \pi \sqrt{\text{long}}] C_{\_\text{VA}}] \\
& \quad \rightarrow /\_\pi \text{length}/+/_\pi \text{en}/ \\
\text{c. (the) length: } & \quad [d\_n \text{ the } [c=n \pi \sqrt{\text{long}}]] \\
& \quad \rightarrow \text{(the) /\_\pi \text{length}/}
\end{align*}
7.3.5 Zero-categorizers: the selection problem

As noted already in Chapter 6, section 2.4 (and see also Embick 2010), the English default past tense marking, -ed, is systematically the only one available for overtly derived verbs. There are no overt verbal derivatives that take either \(-\emptyset\) past tense (plus potential stem allomorph), -t or -d (as in, e.g., /said/, if indeed distinct from -ed), the three other Vocabulary Items available in Halle and Marantz (1993) for past tense marking. Put differently, “irregular” past tense marking in English is only available for morpho-phonologically mono-morphemic forms.

The very same situation holds for English plural marking. When compared with past tense, the variety of plural forms in English is in actuality quite a bit bigger, allowing not only for stem allomorphs (men, women, feet, geese, fish, sheep, etc.); -en, likewise associated with potential stem allomorphs (e.g. axen, children, etc.), and the default -s, but also a variety of originally Latin or Greek plural forms such as -i (foci, loci), -a (data, phenomena) and others. Nonetheless, the only plural form associated with overtly derived nouns is the default -s. In other words, just as in the case of past tense, “irregular” plural marking in English is only available for morpho-phonologically mono-morphemic forms.

Note now that from the point of view of root-based systems, this is a serious bonus, insofar as it provides direct evidence for the existence of roots. Specifically, given the system already outlined in Chapter 6, section 2, the default inflectional marking on all derived forms, both plural and past tense, follows directly from the claim that all instances of selection are local, coupled with the assumption that all exceptional phonological information is associated with the phonological indices we call here “roots”. The reason derived forms are restricted to a default instantiation, then, is that the relationship between the root and the inflectional marking is not local, a fact illustrated in (68) for past tense and in (69) for plural (representations deliberately sidestep the question of whether inflection is morphemic):23

\[
\begin{align*}
(68) & \quad [_{T}\text{-pst}[v][\pi\sqrt{\text{instant}}] C_{v[n]-ate}] -ed] \\
& \quad [_{T}\text{-pst}[v][\pi\sqrt{\text{acid}}] C_{v[n]-ip}] -ed] \\
& \quad [_{T}\text{-pst}[v][\pi\sqrt{\text{harmon}}] C_{v[n]-ize}] -ed] \\
& \quad [_{T}\text{-pst}[v][\pi\sqrt{\text{fat}} EN_{v[A]}] -ed] \\
& \quad [_{T}\text{-pst}[v] EN_{v[A/N]} [\pi\sqrt{\text{case}}] -ed] \\
(69) & \quad [_{CL}\text{-pl}[n][\pi\sqrt{\text{form}}] C_{n[v]-ation}] -s] \\
& \quad [_{CL}\text{-pl}[n][\pi\sqrt{\text{defer}}] C_{n[v]-ment}] -s] \\
& \quad [_{CL}\text{-pl}[n][\pi\sqrt{\text{sister}}] C_{n[n]-hood}] -s] \\
& \quad [_{CL}\text{-pl}[n][\pi\sqrt{\text{refer}}] C_{n[v]-al}] -s]
\end{align*}
\]

22 Irregular plural nouns are a considerably smaller group than irregular past tense verbs (possibly no more than 50–60 to some 400–500 irregular past tense verbs). In a rather sharp contrast with irregular past tense verbs, and with the exception of body parts, human, and domestic animal terms, irregular plurals characterize uncommon vocabulary, largely borrowed from Greek and Latin, and used in scientific, technological, or philosophical jargons. Nonetheless, irregular plurals consistently evade derived nouns.

23 By way of a notational reminder, C-functors with a semantic function are named by their semantic function (e.g. ING\(_{N[v]}\); ER\(_{N[v]}\)). Their phonological realization, when relevant, is marked as a subscript.
The problem which now emerges for models subscribing to the existence of zero categorizers is immediately evident. Consider first the set of assumptions made in Distributed Morphology, and recalling, specifically, that by definition any categorized stem is complex, at the very least bi-morphemic, regardless of whether the node that it merges with is phonologically overt or null—see (23a–b), repeated here as (70):

(70) a. \[ n[\sqrt{WALK}] n_0 \]; \[ v[\sqrt{WALK}] v_0 \]
b. \[ n[\sqrt{CHAIR}] n_0 \]; \[ v[\sqrt{CHAIR}] v_0 \]

In turn, DM does assume, entirely correctly, in my view, that markers such as past tense merge with verbs, and not with (uncategorized) roots, and that presumably markers such as plurality merge with nouns, and not with (uncategorized) roots. But if every verb and every noun are complex, then it follows that the relationship between the root and the past tense marker, or between the root and the plural marker, is no more local in the case of run than it is in the case of instantiate, and no more local in the case of foot than it is in the case of formation or fellowship. For DM, specifically, the relevant representations are thus as in (71) and (72) respectively, where any statement concerning the local selection of non-default inflection is impossible to make:\(^{24}\)

(71) a. \[ [\sqrt{INSTANT}] -v -PST \]; \[ [\sqrt{ACID}] -v -PST \]; \[ [\sqrt{FAT}] -v -PST \]…..
VI: \[ -ate -ed \]; \[ -ify -ed \]; \[ -en -ed \]
b. \[ [\sqrt{RUN}] -v -PST \]; \[ [\sqrt{BEND}] -v -PST \]…..
VI: \[ \emptyset -t \]; \[ \emptyset -ed \]

(72) a. \[ [\sqrt{FORM}] -n -PL \]; \[ [\sqrt{DEFER}] -n -PL \]; \[ [\sqrt{SISTER}] -n -PL \]…..
VI: \[ -ation -s \]; \[ -ment -s \]; \[ -hood -s \]
b. \[ [\sqrt{GOOSE}] -n -PL \]; \[ [\sqrt{OX}] -n -PL \]; \[ [\sqrt{BOOK}] -n -PL \]…..
VI: \[ \emptyset -en \]; \[ \emptyset -s \]

The failure of local selection in such cases is noted and discussed in Embick (2003, 2010). By way of attempting to solve the problem, Embick (2003) suggests that while locality, both hierarchical and linear, is crucial for the determination of root allomorphy, \( \emptyset \)-affixes, across the board, do not count, a property that he refers to as “\( \emptyset \)-Transparency” (p. 166). The claim, we note, amounts to making locality a purely

\(^{24}\) Lexical Phonology and Morphology, with its specific use of zero categorizers, fares somewhat better on this front, but still faces problems, a matter to which I return in section 7.4.5.
linear matter, rather than a hierarchical one, simply because it is not clear that any contexts could emerge in which hierarchical locality would prevail in the absence of linearity, or cases where linearity would not prevail, given the systematic exclusion from the computation of all hierarchical structures in which intervening cycles, or phases, contain ∅-realized matter. We note that empirically, a linear statement would fail, at the very least, to correlate the systematic realization of \( C_n[v] \) as \( /_{n\text{ment}}/ \) in prefixed \( C_v \) contexts. From a broader theoretical perspective, eliminating, effectively, hierarchical conditions on locality within the domain of root realization amounts to a considerably broader departure from syntactic architecture than might be desirable. Finally, and possibly most crucially, we observe here, as elsewhere, the overwhelming difficulties of establishing any effects within word-internal structure that could actually provide any evidence for the presence of zero categorizers. Across the board, it seems, they conspire to occur only in contexts in which their effects can never be detected, and where such detection would be possible it is excluded by specifically attributing hierarchical and linear transparency to them.

We note, finally, that if ∅-affixes are transparent, then it becomes impossible to exclude multiple successive mergers of such ∅-affixes to the same root. Thus if one subscribes to the view that ∅-affixes must be conditioned by the root, the structures in (73) are indeed excluded (cf. (33’)–(34’) and related discussion), but not so the structures in (74) (cf. (20) and related discussion). The point is rather clearly driven home by the fact that for Distributed Morphology, the formal status of e.g. PST and \( v \) is identical. Insofar as the root by assumption is allowed to select a ∅ or a root-dependent realization for its PST tense in (71b), or in a parallel fashion, a ∅ or root-dependent realization for PL in (72b), it is not clear what, if anything, rules out the multiple structures for \textit{walk} or \textit{form} in (74):

(73)  a. *(the) \( \mathbb{[} [\sqrt{LIQU}] \quad v_{fy} \quad n-∅] \)
   b. *(to) \( \mathbb{[} [\sqrt{GOVERN}] \quad n_{ance}v-∅] \)

(74)  a. \( \mathbb{[} [\sqrt{FORM}] \quad v_{∅} \quad n_{∅}] \)
   b. \( \mathbb{[} [\sqrt{WALK}] \quad n_{∅} \quad v_{∅} \quad n_{∅} \quad v_{∅} \quad n_{∅}] \)

In contrast, the selection properties thus far outlined present no problem whatsoever within a system of contextual categorization. One of the main structural differences between XSM and Distributed Morphology involves precisely the claim, within XSM, that morpho-phonological constituent structure does go hand in hand with morpho-syntactic constituent structure, and specifically, that morpho-phonological terminals are not branching syntactic constituents. While in DM both \( form_v \) and \( form_n \) are syntactically complex, in XSM both are non-branching terminals rendered categorically equivalent by their syntactic context, without the addition of syntactic complexity, as in (75) (repeated from (24)):

(75)  a. \( \mathbb{[} [D\ C=N \quad \text{walk}] \quad [T\ C=v \quad \text{walk}] \)
   b. \( \mathbb{[} [D\ C=N \quad \text{chair}] \quad [T\ C=v \quad \text{chair}] \)
By the same logic, morpho-phonological complexity tallies with morpho-syntactic complexity. Derivatives with overt categorizers are complex (see (68) and (69), with some examples repeated below):

\[(76) \quad [\nu^n\sqrt{\text{LIQUI}} \ C_{\nu[N]-ify}]\]
\[ [\nu^n\sqrt{\text{FAT}} \ EN_{\nu[A]}] \]
\[ [\nu^n\sqrt{\text{DEFER}} \ C_{\nu[N]-ment}] \]

Given these representations, XSM is in an excellent position to state the distribution of irregular inflection locally and as linked exclusively to the properties of roots, insofar as the relationship between the roots and the past tense or plural marking is local in (75) but not so in (76), where a categorizing C-functor dominates the root. The formal advantage, we note, derives directly from the fact that given contextual categorization, a root may be categorized, or, more accurately, rendered category-equivalent, without increasing its hierarchical complexity. Not so in a system that assumes zero categorizers, where, for principled formal reasons, a root is never adjacent to inflection marker (a segment of an Extended Projection, in the terminology developed here, or functional node, as conventionally perceived).

I observed in Chapter 6, section 2 that root selection is active within the domain of C-functors as well, where, for instance, only /\_ation/ may be the spellout of \(C_{\nu[v]}\) when attaching to derived verbs. Within Distributed Morphology, at least some of these correlations can be captured insofar as it is explicitly assumed, as already noted, that /\_ation; \_al; \_ance; \_ment/ can only instantiate \(n\) when it attaches to roots. It is thus possible to state that, e.g., \(n\) spells out as /\_ment/ when it merges with √GOVERN, or as /\_al/ when attached to √ARRIVE, and so on. The cost, as already noted, is that insofar as, e.g., /\_ation/ is presumed root-selected, it is not expected to spell out an attachment to \(v\). As it is barred from spelling out an attachment to \(v\), its occurrence next to /\_ize; ify; a\_e\_l/ but not next to, e.g., /\_ous/ becomes a coincidence, and AS-nominals headed by nominals derived with /\_ation/ cannot be assumed to have an {Ex[V]} as their complement, i.e., to dominate any form of event structure. The coincidence could be eliminated and AS-nominals included, of course, if we assume that /\_ation/ always spells out an attachment to \(v\). However, in the absence of contextual categorization, such a \(v\) label for /\_ation/ would have to frequently be a zero-realized one. That √TRANSMIT is nominalized with /\_ation/ would thus be achieved by first deriving \([v\_Ø\sqrt{\text{TRANSMIT}}]\) and then merging it with \(n\). Such \(n\) would now receive the default realization, that of /\_ation/.

As it turns out, however, √TRANSMIT also allows \(n\) to spell out as /\_an\_ce\_l/ and as /\_al/, to give rise to /\_transmittance; transmittal/. One could now proceed to suggest that √TRANSMIT, as a root, selects -\_al and -\_an\_ce, but [\(v\_Ø\sqrt{\text{TRANSMIT}}\)] is nominalized by the default /\_ation/, making the structure which underlies /\_transmission/ more complex and containing a verbal constituent, when compared with that of /\_transmittal; transmittance/ where there is no \(v\). As it happens, however, all three accommodate AS-nominals equally well, and assuming such distinct structures for them would also entail postulating a structural distinction between AS-nominals that are headed by transmission and AS-nominals that are headed by transmittal. If, to allow the common behavior in AS-nominals, however, we merge \(v\) with √TRANSMIT across the board, we would need to give up on the assumption that information about affix realization is
local. The problem of transmittal and transmission would thus come to mimic directly that of English past tense marking on derived verbs, and hence to support, by the same logic, the availability of categorization which does not give rise to structural complexity—i.e. a contextual one.25

7.3.6 Interim summary

The account presented here shares with Distributed Morphology the claim that roots may merge with potentially affixal category labels, C-functors in our terminology. The two accounts differ, however, in their approach to the status of a root once it merges with some additional node, as well as in their view on the nature of categorial functors. In Distributed Morphology, functors such as \( n \) and \( v \) do not have a Categorial Complement Space (CCS). The corollary, in turn, is that roots, in and of themselves, not only do not have a category inherently, a claim shared by the present account, but remain category-less in the syntactic structure. As such, then, no categorial generalizations are ever expected to apply to roots, and all operations which require categorial specification by definition must involve a complex structure. It is worth noting that it is not the case that roots have no syntactic properties in Distributed Morphology—on the contrary. While they do not have an inherent category and never acquire one, they do, nonetheless, select an internal argument, and at least in some accounts (e.g. Harley 2009a, b; Embick 2004) are also allowed to project. What is missing, specifically, is a category, inherent or derived. In turn, and by virtue of being syntactic objects without a category, roots represent a novel syntactic term.

We note now that the need for zero affixes in DM is in fact inevitable, once we dispense with the claim that C-functors effectively divide the categorial space, not only projecting a category, but also defining categorially their CCS. To illustrate, by assumption the complement of e.g. \( \text{the} \) is an N regardless of whether it is pronounced as /\( \pi \text{root} / or as /\( \pi \text{persistence} /. But if so, a category-less \( \sqrt{\text{ROOT} \text{ cannot merge directly with } \text{the}, \text{ and rather some additional nominal structure must be provided to give rise to a nominal constituent, call it } n. \text{ Some occurrences of such } n \text{ would in actuality have a phonological realization, e.g. } /\( n \text{ence} / \text{ in } \text{persistence}. \text{ Crucially, however, one must postulate the possibility of a zero instantiation for others, for short of such a claim, the direct merger of a category-less } \sqrt{\text{ROOT with } \text{the} \text{ would be expected to give rise to ungrammaticality.} \}

The system, we note, is certainly formally sensible on the face of it. As it turns out, however, and as was outlined in the preceding sections, it suffers from serious empirical inadequacies, and leads, inevitably, to internal formal contradictions and

---

25 Yet an additional theory-internal specific problem faces any DM attempt to postulate /\( \pi \text{ation} / as a default realization for merger with \( v. \text{ Transmission, but as it happens neither } \text{transmittal nor transmittance has non-compositional Content. If, as in Arad (2003) and Embick (2010), first categorization is the domain of non-compositionality, it follows that at least sometimes, } /\( \pi \text{ation} / \text{ cannot be the realization of merger with } v, \text{ thereby returning us to the unfortunate starting point already discussed where, in DM, the insertion environment for } /\( \pi \text{ation} /, \text{ must either include a disjunction, or remain oblivious to the categorial nature of the suffixes it merges with.} \)
complications that summarily eliminate whatever prima facie appeal it may have. At least some of these problems are summarized below:

A. In the absence of any direct evidence for the actual presence of zero categorizers in any given configuration, postulating such elements leads to a systematic, inherent inability to correlate morpho-syntactic with morpho-phonological complexity. The failure to correlate morpho-phonological with morpho-syntactic complexity, on the other hand, has as one of its more serious consequences non-falsifiability. What, for instance, could bear on the existence, or lack thereof, of structures such as (77a) when compared with structures such as (77b), and what, if anything, would be the consequences of the structural proliferation of zero categorizers?

(77)  
\begin{align*}  
\text{(77a)} & \quad [v \circ n \circ [v \circ [n \circ [\sqrt{\text{FORM}}]]]] (form) \quad [a \circ a \circ [v \circ [\sqrt{\text{FORM}}]]] \quad (form) \\
\text{(77b)} & \quad [v \circ [\sqrt{\text{FORM}}]] (form) \quad [a \circ a \circ [\sqrt{\text{FORM}}]] \quad (form) 
\end{align*}

The matter is particularly important within Distributed Morphology because of the assumption (see Marantz 2000; Arad 2003; Marvin 2002; Embick 2010) that non-compositionality is delimited by the domain of first categorization. If, for example, the structure of formal is as in (77b), the prediction is that it may be non-compositional. If, on the other hand, the structure of formal is as in (77a), it must be compositional. However, in the absence of clear diagnostics for the structure, the claim runs the danger of being circular, and specifically, of postulating a zero affix exactly where compositionality holds, and failing to postulate it where it fails, without any additional discernible effects for such distinct structures.

B. Because roots, as such, never have a category, affixes which by assumption only attach to roots require multiple redundant statements concerning their categorial selectional properties. For example, -ation must be specified to select a root as well as -ize, -ate, and -ify. The fact that -ize, -ate, and -ify are verbs, and the fact that the roots to which -ation attaches, if they ever occur independently, always correlate to a “zero-affixed” verb, remains a coincidence. More specifically, what emerges within the set of assumptions made by Marantz (2000, 2007), Embick (2010), and Harley (2009a, b), is that -ation may realize attachments to all (Level I) derived verbs except those derived with $\emptyset$, the latter allowing exclusively -ing.

C. If zero-realized $n$ and $v$ do exist, we need to incorporate into the grammar of English something like the statements in (i), or alternatively, the statement in (ii). Both represent a generalization over the phonological properties of vastly distinct syntactic entities, a particularly problematic state of affairs in a system that assumes late insertion of phonological material for functors:

(i)  
\begin{align*}  
\text{(i) a.} & \quad \text{If a root is verbalized by any affix other than } v_\emptyset, \text{ it cannot be nominalized with } n_\emptyset. \\
\text{b.} & \quad \text{If a root is nominalized by any affix other than } n_\emptyset, \text{ it cannot be verbalized with } v_\emptyset. 
\end{align*}

(ii)  
$\epsilon_\emptyset$, cross-categorially, can only merge with roots (except if inflectional).
D. Because the complexity of, e.g., the verb *sing* and the verb *acidify* is identical, root-based locality conditions cannot distinguish between them. What is, unfortunately, lost, is the ability to state that overtly suffixed verbs and nouns never allow irregular inflection.

Alternatively, one could resort to the claim that ∅-realized nodes, but no others, do not create a local domain. This, likewise, involves a generalization over phonological properties of distinct syntactic entities within a system that should be blind to such factors.

E. Because, effectively, *formation* and *form* have the same structure, that is, \([n [\sqrt{\text{FORM}}]]\), with \(n\) spelling out either as *-ation* or as ∅, the fact that *formation* can be an AS-nominal but *form* cannot receives no explanation. By extension, the impossibility of the overwhelming majority of so-called zero-de-verbal nominals acting as AS-nominals remains without an account as well.

In contrast with the predictions of Distributed Morphology, and in a nutshell, what emerges as a result of a careful investigation of the facts is that the structure that underlies what ultimately is realized as /πroot/, when occurring as, e.g., the *root*, is different from the structure which underlies the realization of /πpersistence/, when occurring in that same environment, i.e. the *persistence*. Specifically, and assuming as a constant that the complement of the *must be* (at least) N, it emerges that \([n \text{ persistence}]\) is more complex than \([n \text{ root}]\) and that the former is, at the very least, binary branching, and consists of the merger of two terminals, while \([n \text{ root}]\) behaves consistently and systematically as a non-branching terminal.

At the most immediate level, the conclusion that can be drawn from this difference is that the N status of *root*, if it has one in the context of the *root*, cannot be acquired along the same lines as *persistence*. By extension, it casts a serious doubt on the existence of zero realizations of *n* or any zero-realizations of categorizers in general. Even further, it points towards the availability of some mechanism that would effectively render √ROOT licit in an N context although it is, by assumption, devoid of any inherent category, and that it would do so without adding structural complexity. Viewing categories as equivalence classes determined by syntactic context is one such mechanism, insofar as it allows us to specify a syntactic domain within which category-less roots would become category-equivalent as a direct consequence of the properties of their immediate Merge environment.

But if so, then two other theoretical ramifications emerge, neither of them trivial. First, to the extent that all roots merge with *something*, all roots are rendered category-equivalent in the relevant sense. It thus emerges that there are no category-less nodes in the syntactic tree, altogether a desirable result, as it is not entirely clear, within a fundamentally structural approach to language and grammar, what the properties of category-less syntactic nodes might be, nor how their distribution can be delimited. The second theoretical ramification is, likewise, of some interest. Insofar as the nominal occurrence of \([n \text{ root}]\) is syntactically less complex than \([n \text{ persistence}]\), and insofar as the morpho-phonological complexity of /πroot/ is certainly less than that of /πpersistence/, this approach suggests that there is direct gain from assuming, as the null hypothesis, a strong correlation between morpho-phonological complexity and morpho-syntactic complexity.
Finally, we note that we have now come a full circle. In Chapter 1 (and see also Chapter 6) I suggested that while derivational morphology, so called, and specifically categorizers, do project syntactic structure and can be accommodated by syntactic computational systems, inflection, so called, is not morphemic in itself, but rather represents a phonological realization of unordered markings on a stem, albeit acquired in a structural context. Insofar as zero marking is endemic in inflection, and insofar as the richness of inflectional information all too frequently does not correspond to morpho-phonological complexity, this difference serves not only to distinguish the formal systems, but to also suggest that it is precisely categorizers, C-functors, which come with a syntactic structure, and it is precisely inflection which does not.

7.4 Against English Zero Categorizers, Part II: Kiparsky (1982a, 1997)

An argument against the existence of zero categorizers cannot be complete without reviewing and challenging successfully the wide range of arguments in their favor brought forth by Kiparsky (1982a, 1997).

As we noted previously, Kiparsky argues for (at least) two zero categorial affixes in English, one which derives nouns from verbs and which is a Level I affix, and another one which derives verbs from nouns, and which is a Level II affix. Insofar as there are distinct zero V and zero N categorizers, Kiparsky’s account tallies with that of Distributed Morphology. However, in contrast with DM, as well as with the account put forth here, he assumes a directional derivational relationship—∅-derived nouns and ∅-derived verbs are not derived independently from roots, but from each other. In turn, the major force of his argument derives from the distinct properties of ∅N and ∅V. We note, specifically, that in a system that assumes no zero categorizers in English and which rather subscribes to the view that both verbal and nominal instantiations of unmarked noun–verb alternations are categorized contextually from without, such differences, if present, are unexpected and in principle problematic, unless they can be explained by appealing either to general differences between nouns and verbs, or to the properties of the functor which the root is the complement of.

Within systems that subscribe to the Level Ordering Hypothesis, of which Lexical Phonology and Morphology is the most articulated execution, the most fundamental claim is that (English) affixes can be divided into (at least) two distinct pools, with distinct semantic, morphological, and phonological properties associated with each pool, and with one of these pools—Level I affixes—ordered before (=inside of ) the second—Level II affixes. Some of the crucial properties of each pool are listed in (78).26

26 The explanatory value of the classification has, in turn, come under considerable criticism in the past two decades, beginning, specifically, with Fabb (1988) and continuing with Plag (1999). See Chapter 6, section 2 for some relevant comments, as well as a more detailed discussion in Chapter 9, sections 2 and 4.

Forms in parentheses are in reference to affixes whose status is either mixed or in dispute, insofar as they may not affect stress directly, but allow the further merger of stress-shifting affixes. See, primarily, Chapter 9, sections 2 and 4 for discussion:

(i) a. vérbal → vérbalize but → verbalización
b. gôvern → gôvernment but → gôvernmentál
7.4.1 Two de-nominal verbs in English?

Consider now the paradigm in (79)–(80), and examining specifically the relationship between the verbal and nominal instantiations of hammer, paint, tape, and lacquer:

(79)  a. I hammered the nail in (with my sandal).
     b. I painted the wall (with lacquer).

(80)  a. I taped the picture */#with pushpins).
     b. I lacquered the wall */#with paint).
     c. Screw the fixture on the wall */#with nails).

We note that in all these cases, the highlighted items could occur as both nouns and verbs, and so this is not the source of the relevant contrast. Rather, Kiparsky (1997) notes, the Content of paint appears to be considerably more flexible than that of lacquer, and hence it is possible to paint with something other than paint; and the Content of hammer is considerably more flexible than the Content of tape, and hence it is possible to hammer with things which are not a hammer. The anomaly of the instrumental specification in (80), it would appear, emerges from the fact that taping can really only be done with a tape, and lacquering can only be done with lacquer. But why should that be so? The reason, Kiparsky argues, is that the verbs tape and lacquer are derived from the corresponding nouns with a ∅-verbal suffix which is a Level II suffix. Level II operations derive from words, and are compositional. On the other hand, hammer and paint are cases in which the noun is derived from the verb at Level I. Level I affixation may be non-compositional. Specifically, the Content of the verb hammer is not actually USE A HAMMER, but rather is entirely compatible with a broader Content of exerting force by repeated blows, on nails or otherwise, with any heavy object. The Content of the verb paint clearly is not actually COVER WITH PAINT, but rather COAT WITH DECORATIVE LIQUID FINISH. In turn, because tape and lacquer are derived from nouns at Level II, they are, so to speak, accountable to the Content of the original nouns TAPE and LACQUER, resulting in the relevant restrictions.

<table>
<thead>
<tr>
<th>(78) a. <strong>LEVEL I (± boundary) affixes</strong></th>
<th><strong>LEVEL II (# boundary) affixes</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>attach to words and non-words</td>
<td>attach only to words</td>
</tr>
<tr>
<td>may or may not be productive</td>
<td>productive</td>
</tr>
<tr>
<td>output may or may not be compositional</td>
<td>output compositional only</td>
</tr>
<tr>
<td>may or may not involve irregular inflection</td>
<td>regular inflection only</td>
</tr>
<tr>
<td>affect (some) phonological rules</td>
<td>do not affect (same) phonological rules</td>
</tr>
<tr>
<td>assimilation</td>
<td>no assimilation</td>
</tr>
<tr>
<td>stress shift</td>
<td>no stress shift</td>
</tr>
<tr>
<td>tend to be Latinate</td>
<td>tend to be Germanic</td>
</tr>
<tr>
<td>tend to attach to Latinate bases</td>
<td></td>
</tr>
</tbody>
</table>

b. \( C_V \)  (-ize), -ify, -ate  
\( C_{N[V]} \)  -ation, -al, -anc(y)/enc(y),(-ment)  
\( C_A \)  -ous, (-able), -al  
\( C_{N[A]} \)  -ity  
\( -en, en-, be-, (-ize) \)  
\( -ing, (-ment) \)  
\( -ened, -er, -ful, -less,(-able) \)  
\( -ness \)  
N-N, A-N compounds
As Harley and Haugen (2007) show, however, the judgments in (80) appear to result from a certain misclassification of the canonical Content of tape, lacquer, and screw, respectively. Thus consider the examples in (81)–(82) (G = Google search):

(81)  a. Lola taped the poster to the wall with band aids/mailing labels.
     b. Screw the fixture on the wall with nails – OK, providing nails are twisted to affix the fixture

(Harley and Haugen 2007)

(82)  Bento boxes of the week: lacquered with bitter persimmon juice (G)

What Harley and Haugen (2007) point out is that the infelicity of (80a) may, indeed, emerge from the fact that the verb tape cannot mean AFFIX in general. But for that matter, the verb hammer does not mean HIT in general. In turn, hammer does not have the Content of HIT WITH A HAMMER, but neither does tape have the Content AFFIX WITH TAPE. Rather, it appears that the Content of tape is AFFIX WITH STICKY STRIPS. Similarly, the verb screw need not involve screws, providing whatever is used is being twisted in. The verb lacquer, likewise, is neither COVER WITH LACQUER nor COVER WITH DECORATIVE FINISH, but rather something like CREATE A GLOSSY HARD FINISH. As Harley and Haugen further point out, if Kiparsky’s analysis were correct, one would have expected (83a) to be tautological and hence anomalous without a modification of tape, but not so (83b). As it turns out, both are anomalous in an exactly equivalent fashion:

(83)  a. I taped the picture with a ??(duct) tape.
     b. I hammered in the nails with a ??(big) hammer.

In view of these facts, it appears fairly safe to dismiss this particular argument in favor of two distinct ∅-categorizers operating at two different levels.

7.4.2 Productivity?

\[_{y[N]\cap_{\emptyset}}\], a Level II operation, is very productive, Kiparsky (1982a) claims. Not so \[_{x[V]\cap_{\emptyset}}\], which is a Level I operation. We note, however, and with (40) in mind, that the non-productivity of \[_{x[V]\cap_{\emptyset}}\] is highly questionable. By way of some specific illustrations, note that the following are all possible, and some are clearly a recent addition (the Boston Globe ran a headline with an embed in it three weeks after the beginning of the first Gulf War):

(84)  a. an admit (a newly admitted student)
     b. an admit (a record of a positive admission decision or a newly admitted student)
     c. give it a think (note the absence of Blocking from thought)
     d. give it a turn (meaning turn it)
     e. a responsive read (proof reading process, from a magazine editorial board)
     f. there are people on that list who deserve a listen
     g. an embed (a journalist “embedded” in a US military unit)
7.4.3 Stress shift?
V → N alternations may give rise to stress shift, as in (85a), Kiparsky observes, but not so the N → V alternations in (85b):

(85) a. permit_v → pérmit_n; progréss_v → progrès_s_n; admit_v → ádmit_n
    b. páttern_N → *pattérn_v

If Level II affixation is involved in N → V, and if stress shift is applicable only to the output of Level I affixation, the absence of stress shift in the change from N → V vs. its possibility in V → N cases would be explained.

The claim, however, is less than straightforward. Note, first, that the stress patterns of, e.g., progrèss_n or admit_n are precisely those otherwise associated with the Compound Stress Rule, with its stressing of the non-head left member of the compound. And yet, compound formation is, by assumption, a Level II rule. The analogy with compounds is particularly appropriate given the fact that the putative stress retraction in such (presumed) V-to-N derivation is typically attested in the presence of a prefix+stem combination. It is, specifically, not in the least clear that forms such as pérmit_n are derived from a verb, rather than independently from combining the stem/root and a prefix, and with the result giving rise to compound stress. Consider, in this view, the modernly formed compound input. It clearly is not Level I. Not only is it recent, but at least arguably it is still /i_input/, and not /i*_input/, and hence not a Level I formation. Nor is it derived from a verb, as a corresponding verb does not exist. It may be derived, of course, from the incorporation of in, having as its source put in, but such a derivation clearly does give rise to a compound-like formation, and cannot involve the nominalization of the entire output through ∅-affixation (and see Chapter 6, section 4 for some comments on particle incorporation and compounds). Finally, we note that although there is substantial evidence in English for stress shift to the left in compounds, including compound roots, there is little evidence for stress shift to the right for verbs derived at any level (nor is Kiparsky 1982a, 1997 assuming one). It thus emerges that if the derivation of e.g. progress in its nominal and verbal instantiation is as in (86), the relevant output would correspond directly to the actually attested paradigm:

(86) a. [Ex[V]] [C=v[^GRESS][pro]] → [C=v[pro][C=v[^GRESS][pro]]] → /s_progress/
    b. [Ex[N]] [C=n[^GRESS][pro]] → [C=n[pro][C=n[^GRESS][pro]]] → /s_progrèss/

Compound Stress Rule.

By way of lending additional support, specifically, to directional treatment of the stress alternation of forms such as pérmit and permit, Kiparsky notes the existence of triplets such as those in (88). What is notable about these triplets is the emergence of a second instantiation of the verb, but with the nominal stress pattern:

(87) compound_v, cómpound_n, cómpound_v
    permit_v, pérmit_n, pérmit_v
Such triplets, Kiparsky argues, must have the analysis in (88). The original verb, e.g. *permit*, merged with $\emptyset_N$ at Level I with stress shift resulting. The second occurrence of the verb, as *pérmit*, on the other hand, clearly takes the nominal form as its input, and being a Level II formation, does not allow for the change of stress, giving rise to *pérmit*:

\[
\begin{align*}
(88) \quad \text{(a)} \quad \text{[compound]}_V & \rightarrow \text{[[compound]}_V \emptyset_N N (\text{level I}) \rightarrow \text{[[compound]}_V \emptyset_N N \emptyset_V]_V (\text{level II}) \\
\text{(b)} \quad \text{[permit]}_V & \rightarrow \text{[[pérmit]}_V \emptyset_N N (\text{level I}) \rightarrow \text{[[pérmit]}_V \emptyset_N N \emptyset_V]_V (\text{level II})
\end{align*}
\]

We note now that intuitively, it is of course entirely obvious that the emergence of *pérmit* is a result of the existence of *pérmit*. The question, however, is whether the conclusions drawn by Kiparsky are inevitable. Consider, specifically, the possibility that the nominal instantiation of *pérmit* is derived as in (86b), specifically subject to the Compound Stress Rule and derived directly from a combination of the root with a particle. Suppose now that at least under one of its instantiations, /pérmit/ has become relisted as a separate root, presumably under pressure from drifting Content.\textsuperscript{27} Alongside the derivation from root-particle compounding depicted in (86b), then, the language has now acquired the root $^{\pi \sqrt{pe´rmit}}$ (and $^{\pi \sqrt{compound}}$), which, we expect, will proceed to occur as both V- and N-equivalent:

\[
\begin{align*}
(89) \quad \text{(a)} \quad \text{[Ex[V]]} & \rightarrow \{c=v^\pi \sqrt{pérmit}\} \rightarrow /\pi \text{pérmit}/ \\
\text{[Ex[V]]} & \rightarrow \{c=v^\pi \sqrt{compound}\} \rightarrow /\pi \text{compound}/ \\
\text{(b)} \quad \text{[Ex[N]]} & \rightarrow \{c=n^\pi \sqrt{pérmit}\} \rightarrow /\pi \text{pérmit}/ \\
\text{[Ex[N]]} & \rightarrow \{c=n^\pi \sqrt{compound}\} \rightarrow /\pi \text{compound}/
\end{align*}
\]

Yet again, a comparison with *input* may be informative. *Input* now does have a verbal instantiation (cf. (90); note the variability of inflection attested):

\[
(90) \quad \text{a. How to input the data from a txt file into an arraylist (G)} \\
\text{b. we will input the data, one point at a time (G)} \\
\text{c. The students then inputted the data they collected (G)} \\
\text{d. Strings and characters are input by using single or double quotes (G)}
\]

Under the assumption that the noun instantiation of *input* predates, historically, the verbal instantiation, and under the assumption that the nominal instantiation emerged as a result of the incorporation of a particle, we have here, attested relatively recently, the exact process which would give rise to the sequence of stress shift and triplet emergence documented by Kiparsky (1982a) for *permit* and *compound*:

\textsuperscript{27} While roots as such do not have Content, Content is searched on the basis of phonological representations (see Chapter 9, sections 2–5 for extensive discussion). Insofar as e.g. /pérmit/ might come to correspond, systematically, to two distinct Content units, one compositionally related to the same root as the verbal instantiation /pérmit/ and one distinct from it, such a state of affairs would encourage the emergence of a distinct root, a phonological index, $^{\pi \sqrt{pérmit}}$ with a consequent verbal instantiation.
It is worthwhile noting, finally, that Compound Stress in English is, as is well established, subject to certain idiosyncrasies that are poorly understood, and which do not clearly correlate with any semantic or architectural conditions, and thus established, subject to certain idiosyncrasies that are poorly understood, and which

verb, but not so 

admit 

that the forms in (sine qua non stress patterns, one with stress retraction, and one without. If stress retraction were a (composite nouns but not in others, the status of (putative) stress retraction as an argument for a derivational direction becomes altogether questionable.

7.4.4 An argument from ordering

We noted briefly, in fn. 8, the existence of cases such as (92):28

a. a portion, the condition, rations, a motion, the air condition, positions, a proposition, the audition, questions

b. to portion, to condition, to ration, to motion, to air condition, to position, to proposition, to audition, to question

28 Whilst -ation ending cases account for a substantial number of affixed forms which allow unmarked
categorial shift, they are not the only ones. The presence of to blockade was already noted in section 7.3.2.
-age and particularly -ure, likewise, are attested as verbal forms, -age somewhat uncommonly, but -ure rather frequently with the title of this very book Structuring Sense, being a case at hand, but also to bandage, to voyage, to puncture, to gesture, to picture, to culture, to conjecture, among others. We note in this context that the CCS of AGE is not self-evident, insofar as in foliage and footage it appears to share Content with otherwise N-equivalent instantiations, while in driffage and floatage it appears akin to V-equivalent forms. Rarely, if ever, do AGE nominals make good AS-nominals, a fact that is readily explained if, compositionally, they are associated with a semantic function somehow akin to “substance” and which thus might be incompatible with event structure. The properties of -ure are even harder to pinpoint, insofar as it is extremely unproductive and only rarely attaches to a base otherwise recognizable. Although -ure affixation is assumed (but not crucially), e.g. in Chapter 9 in the context of non-compositional forms such as nature, the author is rather inclined to believe that its functorial role is largely lost. Although forms such as nature or structure may still be bi-morphemic, in some sense, a possibility made plausible by the occurrence of both nat and struct in contexts where postulating an identical root seems plausible, in the absence of a categorical function for -ure, the output is category-less and hence susceptible to contextual categorization, rather on a par with compounds as in (29) or (93) directly below.

Finally, we note that without exception, and as per text discussion, all relevant cases involve a shift away from affixed instances of N to V, and none involve affixed instances of V turning to N, a puzzling fact in itself and certainly unexplained by postulating ∅ N and V categorizers. The picture does, however, lend some support to the claim, advanced in Acquaviva (2011), according to which roots are at least in some fundamental sense nominal, with the consequence that all “relisted” roots may have a more prominent nominal construal.
The cases, at least prima facie, appear to contradict the claim made in section 7.3.2, according to which unmarked noun–verb alternations in English are only attested with underived forms, by assumption roots. In turn, Kiparsky (1982a) suggests that such cases, in which derived nominals seem to give rise to verbs without overt marking, but by assumption with \( \emptyset_v \) affixation, argue for the ordering of \( \emptyset_v \) affixation later than -ation affixation, the latter clearly a Level I affix. Similarly, \( \emptyset_v \) attachment to compounds, as in (29) (repeated here as (93)) argues for \( \emptyset_v \) ordering after compounding, itself a Level II operation, and hence for \( \emptyset_v \) as a Level II affix:

(93) a. wardrobe b. to wardrobe
blackboard to blackboard
chicken wire to chicken wire
wallpaper to wallpaper
grandstand to grandstand
network to network

Note first that even within the logic of Kiparsky’s system, the complete absence of nominal forms such as those in (94), with unquestionable Level I verbal suffixes, cannot be explained:

(94) a. *a collate b. to collate
*a pacify to pacify

If, as Kiparsky claims, \( \emptyset_N \) is Level I and merges with e.g. hammer, at that level, we expect its exclusion with en- and -en, by assumption Level II, and possibly with -ize, given its ambiguous level status. However, we certainly expect it to occur freely with -ify and -ate. That no such nominals are ever attested is thus a problem. Finally, we note that while the Kiparsky system predicts much wider generality for the forms in (92) than is actually attested, it fails in a systematic way to account for the fact that, in the bulk of the cases, zero affixes, both of the \( \emptyset_N \) and the \( \emptyset_v \) variety, attach to underived forms. Given the claim that such zero affixes are the culprits in (92), in fact, it cannot even avail itself of the statement, possible in DM, that for some reason \( \emptyset \) affixes across their categorial instantiations must be root-adjacent.

Suppose we turn, however, to the cases that do exist, namely those in (92). A closer look at the cases under consideration reveals that the only -tion ending forms which undergo such unmarked noun–verb alternation are forms which in their nominal instantiation do not have a coherent verbal source from which they could possibly be (synchronically) derived. These and possibly similar cases could be divided into two groups. Those in (95a) are cases in which the subtraction of -ation gives rise to an otherwise virtually unattested verb, bound or free. Those in (95b) are cases in which the subtraction of -ation gives rise to an existing Contentful English verb, but with a Content that is clearly divorced from that of the complex form in (92).29

29 An interesting case emerges in the context of motion. Thus although the Content of move, as a verb, and the Content of motion, as a noun, are at least in some contexts extremely close (cf. ia–b), the distribution of motion as an R-nominal is distinct from that of movement or moving, the latter clearly derived from the verb move. We note that even in cases where, e.g., movement cannot, Content-wise, be
(95)  a. *port-, cond-, rat-
b. to pose, to propose, to audit, to quest

That the forms in (92) which do appear to have a “source” are not in any way whatsoever related to that putative source can be seen from the complete impossibility of using them as AS-nominals with the Content of the source verb. Thus there is no way the underlined nouns in (98) could possibly be the AS-nominals expressing the events in (96) or in (97). In fact, the nominals in (98) are altogether ungrammatical as AS-nominals, barring aspectual modifiers, argumental by-phrases, and purpose clauses:

(96)  a. The model posed in front of the camera for several hours (in order to give herself a chance to deliver the correct photograph).
b. Mary proposed a solution in two minutes (in order to please her boss).
c. The authorities audited my tax records for several weeks (in order to establish my guilt).
d. John quested for love for years (in order to become happy).

(97)  a. the posing of the model in front of the camera for several hours (in order to …)
b. Mary’s proposal of a solution in two minutes (in order to …)
c. the proposal of a solution (by Mary) (in order to …)
d. the authorities’ auditing of my tax records for several weeks (in order to …)
e. the auditing of my tax records (by the authorities) (in order to …)
f. the questing for love for years by adult males (in order to …)

(98)  a. *the position of the model in front of the camera (for several hours) (in order to …)
b. *Mary’s proposition of a solution (in two minutes) (in order to …)
c. *the proposition of a solution by Mary

related to the Content of move but motion is, motion nonetheless cannot be an AS-nominal, as (iia–b) illustrate. We note in this context the existence of motive and emotive, both with Content that is less than related to either motion or move:

(i)  a. The senator moved that we approve the bill in order to irritate the president (move in order to irritate).
b. The senator made the motion/moving that we approve the bill.

(ii)  a. *the senator’s movement/moving that we approve the bill/to approve the bill
b. *the intentional motion (by the senator) that we approve the bill/to approve the bill in order to irritate the president (move in order to irritate)

A. Lazorczyk (p.c.) notes a potential counter-example, involving the verbal occurrence of suction in spite of the occurrence of suck. Notwithstanding the phonological and Content similarity, suction is not a possible nominalization for suck, and is impossible as an AS-nominal:

(iii)  a. the sucking of the fluids for three minutes by the competent nurse in order to save the dying patient
b. *the suction of the fluid for/in three minutes by the competent nurse in order to save the dying patient
d. *the authorities’ audition of my tax records (for several weeks) (in order to . . . )
e. *the audition of my tax records
f. *the question for love (for years) by adult males
(All * with the intended reading as events associated with (96a–d))

This is in actuality quite noteworthy, because in barring a compositional AS-nominal reading, the -tion forms in (98) behave differently from other cases of non-compositional derived nominals, of which there are many. Transmission or contraction (as in birth-related spasm), to exemplify, while certainly endowed with Content that is no longer computable directly from either transmit or contract, nonetheless continue to be licit as the realization of fully compositional AS-nominals of their verbal source. In contrast with (98), these AS-nominals are well formed (and necessarily compositional, a matter I return to in Chapter 9):

(99)  
  a. Mary’s transmission of the documents (in two minutes) (in order to . . . )
  b. the gradual contraction of the rubber band for three hours

It thus emerges that the forms in (92) with the putative source in (95b) have gone beyond acquiring a non-compositional Content, and rather proceeded to lose the ability to contain, within them, the verbal source from which they were, at some point, derived. Put differently, the relevant forms no longer contain a functor, with the result that an N is no longer projected, and an internal V CCS is never defined. Unsurprisingly, and given the absence of a discernible verb altogether, the cases in (95a) do not give rise to AS-nominals either, as (100) illustrates (and see Chapter 9, sections 1 and 3 for the relationship between a “real” verb and AS-nominals):

(100)  
  a. *the motion of the model in front of the camera (for several hours) (in order to . . . )
  b. *Mary’s condition of the furniture (in two minutes) (in order to . . . )
  c. *the ration of the food by the government

In fact, the forms in (92) have exactly the cluster of properties we typically find either with category-less roots, or alternatively with the compounds in (93) when headed by such category-less roots. They exhibit an unmarked alternation with verbal forms, conditioned solely by Extended Projections; they may not function as AS-nominals; and finally, they require an overt V-selecting N-functor in order for an AS-nominal to emerge:

(101)  
  a. the condition *(ing) of certain responses by certain works of literature
  b. John’s proposition *(ing) of Mary
  c. Mary’s question *(ing) of John
  d. Kim’s audition *(ing) of the candidate

In view of this, there is little reason to believe that the -tion marker on the forms in (92) is an instance of \(C_{\overline{n}\overline{V}}\), or that the operation involved requires any re-categorization, so to speak. I will assume, rather, that their historical emergence notwithstanding, for present-day English, they have been relisted as roots, and their subsequent properties are, indeed, those that we fully expect from roots.
We note now that the strongest argument for deriving the forms in (92) from the attachment of a $∅_v$ to a derived noun comes from the observation that zero-marked N–V alternation in English is extremely productive, and that practically any monomorphic noun in English has a homophonic verbal correlate. As a result, proponents of Level II $∅_v$ would surely want to postulate it as an extremely productive affixation rule. And yet the cases in (92) are quite rare and clearly not productive. Nor do we expect any correlation between the availability of $∅_v$ and the lack of a compositional reading for its base. Why should $∅_v$ attach to question, but not to formation? Why should it attach to section, but not to admission, or admission, for that matter? In short, there is simply no possible explanation, as based on the Level II status of $∅_v$, for the complete impossibility, in English, of the forms in (102a), or for that matter, for the complete exclusion of such $∅_v$ attachment to any nominal forms that merge with already derived forms, by assumption already categorized, even if the latter involve Level I affixes. To wit, -ify is clearly a Level I affix, and yet there are no cases of verbal instantiations for -ification ending nominals (cf. (102b)), nor are there any for nominals ending with -ity, the latter always merging with derived adjectives, as (102c) illustrates (and see section 7.6 on -ity).

   b. *to liquefaction, *to solidification, *to purification, *to mollification  
   c. *to porosity, *to verbosity, *to nativity, *to capability, *to orality, *to nasality

Turning to the compounds in (93), we note that analyzing the verbal variant as involving $∅_V$ suffers from exactly the same problem. I noted already in discussing this matter that alongside the grammaticality of the verbal instantiations in (93), we have the contrastively ungrammatical cases in (103) (and see also (28)):

(103) a. math teacher         b. *to math teacher  
    mass destruction      *to mass destruction  
    law enforcement       *to law enforcement  
    fellow traveler       *to fellow traveler  
    piano recital         *to piano recital   
    word formation         *to word formation

Note that no -ation (rather than bare -ion) nominals belong in the set in (92). If, indeed, such cases are restricted to exclude embedded derived verbs, as the text discussion argues, then this suggests that all -ation forms occur in the context of derived verbs, and that specifically, -ation is a composite affix, consisting of a $C_v$ functor spelling out as $l_aate$ and a $C_{N[V]}$ functor, spelling out as $l_aation; sion$ exclusively. The possibility is certainly an attractive one, but faces at least some prima facie executional complication from the existence of licit verbal instantiations such as $l_aforml$ or $l_aquote$ which select $l_aation/ in the absence of licit $l_aformatl$ or $l_aquotatal$. The matter is not discussed further here but it is worthwhile noting that Plag (1999) analyzes -ate as a verbal affix which is a back formation from -ation.
In Kiparsky’s system, there is simply no reason for this contrast. Compounds are a Level II process, as is the affixation of $\emptyset_v$, and compound formation is oblivious to the derivational history of its head. There is no difference, compound-wise, between chicken wire and word formation. That it is exactly the compounds with a nominally-marked head that block verbalization, but not others, follows from a contextual categorization, but cannot be derived by appealing to the properties of a Level II $\emptyset_v$.

7.4.5 Triplets and the proliferation of $\emptyset$ nominalizers

Kiparsky’s (1982a) system, as set up and as discussed already in section 7.4.3, predicts triplets consisting of an underived verb, then converted into N by an $\emptyset_N$ affix at Level I, which is in turn converted into V by a $\emptyset_v$ affix at Level II. On the other hand, $N\rightarrow V\rightarrow N$ triplets should be barred, as $N\rightarrow V$, by means of $\emptyset_v$, is a Level II affix, thereby bleeding, so to speak, the Level I $V\rightarrow N$ rule. Some examples of such triplets are repeated here as (104):

(104) compóund$_v$ cómpound$_N$ cómpound$_v$

    permit$_v$ périmit$_n$ périmit$_v$

As it turns out, however, $N\rightarrow V\rightarrow N$ triplets do actually occur, as Kiparsky himself notes:

(105) a. sweat$_N(1) \rightarrow$ sweat$_v(2) \rightarrow$ sweat$_N(3)$ ((1) = Substance N; (3) = Result N)

    b. spit$_N(1) \rightarrow$ spit$_v(2) \rightarrow$ spit$_N(3)$

    c. paddle$_N(1) \rightarrow$ paddle$_v(2) \rightarrow$ paddle$_N(3)$

By way of accounting for such triplets, Kiparsky suggests that there are in fact two distinct rules which derive nouns from verbs by means of $\emptyset_N$, both of them applying at Level I:

(106) Rule 1: $V \rightarrow$ Result N (to)[sweat]$_v \rightarrow$ (have) [[sweat]$_V$ $\emptyset^R_N]_N$

Rule 2: $V \rightarrow$ Substance N (to)[sweat]$_v \rightarrow$ (smelly) [[sweat]$_V$ $\emptyset^S_N]_N$

In what is a rather ironic twist, note first that, e.g. screw and tape, in their nominal instantiation, may be both a substance and a result (the latter with a particle), but if the analysis of the triplets in (105) crucially involves the existence of a basic verb, than tape and screw would have to be derived from verbs, rather than the other way around.31

(107) a. have a tape up (of one’s hair)

    b. cause a screw-up

Further, in addition to postulating a third zero categorizer and a second instance of $\emptyset_N$, we note that if we were, for instance, to assume that the two occurrences of

31 It is extremely unlikely that the particle, in itself, is making a difference here, insofar as hammer, as well, by assumption, originally a verb, can only make a satisfying nominal result with a particle (e.g. hammer out a deal).

admit in (84) are derived through such two distinct $\emptyset_N$ affixes, we would also need to state that while $\emptyset_N$-substance gives rise to (optional) stress shift, $\emptyset_N$-result never does. What, then, is the evidence that this particular $\emptyset_N$ rule is a Level I affixation rule, rather than Level II? This is particularly striking also because the “result” reading, for “zero-derived” nouns, is by far the more common one for the productive cases already noted in section 7.3.2, such as walk, jump, run, read, etc. Finally, the specific derivational direction assumed here perforce must derive, e.g., the noun paddle from the verb paddle, the noun shit from the verb shit, and so on, rather contrary to, e.g., their epistemological salience. While epistemological salience, in the system under consideration here, cannot provide guidelines for the direction of derivation, this is nonetheless a troubling counter-intuitive result for a system that is lexicon-based and where the basic listed units are lexemes which have a category as well as Content, and where lexical semantics is assumed to have some sort of a say as to what might or might not be a basic listed unit.

7.4.6 Irregular inflection and the direction of derivation

That shit$_N$ and spit$_N$ in both substance and result reading are derived from the verb rather than the other way around is an inevitable consequence, in Kiparsky’s system, not only from the fact that they constitute part of an N,V,N triplet, but even more crucially it is a consequence of the fact that both shit and spit, in their verbal instantiation, have an irregular past tense.

Recall now that restricting irregular past tense and irregular plural to local contexts presented a problem for Distributed Morphology, insofar as the relationship between the root and the inflection is no more local in cases such as read$_V$ and foot$_N$ than it is in cases such as harmonize$_V$ and formation$_N$. In addressing this issue, Lexical Phonology and Morphology fares somewhat better, as irregular inflection is specifically associated with Level I. If, e.g., -ness, or -hood, or -ship are Level II affixes, then their failure to occur with irregular plural follows. Likewise, verbs that are derived by Level II affixation, for instance, -en as in fatten, or the categorizing prefixes en- or be-, all plausibly Level II, should not allow irregular past tense, which is correct. Finally, verbs that are derived from nouns by means of $\emptyset_V$ are predicted to be inflectionally regular, because $\emptyset_V$ is a Level II affix, and its output has no access to irregular inflectional processes.

As it turns out, the approach is too unrestricted and too restricted, at the same time. By way of illustrating the former, we note that as the verbal suffixes -ify, and -ate, and possibly -ize as well, are Level I, it is not clear why irregular past tense inflection is not available to them. Similarly, as -ation, -ence/ance, and -al (or, for that matter, -age), as well as -ity, are Level I suffixes, it is not clear why irregular plural inflection is unavailable to them. In all of these cases, the correct generalization appears to involve a contrast between a root and a derived form. However, once such a statement is made, the classification to Level I vs. Level II becomes redundant to the determination of inflection.

By way of illustrating the way in which the system is too restricted, consider the cases in (108), of which shit and spit are two:
In all of these cases, we note, LPM would have to assume a noun that is derived from the verb, rather than the other way around, as, by assumption, a verbal derivative would be a Level II creation and hence inflectionally regular. In all of these cases (as well, of course, as in all cases in which the verb is regularly inflected) one wonders whether there are any independent means of deciding what the derivational direction is (assuming, of course, there is one, rather than two parallel derivations from a root). At least in the cases in (108), epistemological salience, or statistical frequency, cannot always easily be appealed to, as at least some of the nouns, Content-wise, are very close to the verbs. As a result, the underived nature of, e.g., mistake\textsubscript{v} vs. mistake\textsubscript{n} or light\textsubscript{v} vs. light\textsubscript{n} rises and falls not only on the assumption that irregular inflection is the prerogative of Level I operations, but considerably more crucially on the claim that there is a \(\emptyset\)\textsubscript{v}, and that it attaches to nouns at Level II. On the other hand, if the correct generalization is, as here, that irregular inflection is root-controlled locally, the restriction on irregular inflection would follow automatically quite independently of level. From the perspective of root-selected restrictions, then, there is little reason to assume that mistake\textsubscript{n} and shit\textsubscript{n} are derived from their verbal sources (or the other way around, for that matter).

When we turn to \(\emptyset\textsubscript{n}\), a Level I affix, we do, in actuality, expect the output nouns to display at least some measure of irregularity. Instead, nouns putatively zero-derived from verbs are largely regular, a result that does not follow from Kiparsky’s system. By comparison, in a root-based system irregular plurals are expected for N-equivalent roots, and insofar as this is not attested when such N-equivalent roots have V-equivalent homophones, this fact alone does not favor any of these accounts.

One final note on irregular inflection and \(\emptyset\)-affixation is warranted. As Kiparsky (1982a) notes, the past tense of grandstand\textsubscript{v} is grandstanded, not *grandstood. This, in his system, follows from the fact that compounds are Level II formations, and hence it must be the case that the verbal instantiation of grandstand is derived from the nominal one at Level II, through the affixation of \(\emptyset\textsubscript{v}\). And as at Level II irregular inflection is no longer available, we get the obligatorily regular past tense of grandstand\textsubscript{v}.

The argument, however, is rather weakened by the fact that vocabulary innovations, in general and across the board, require regular inflection quite regardless of
their derivational complexity or their derivational history. It is thus unlikely that the computer-gadget use of mouse is more morphologically complex than mouse as in use in reference to a rodent, but nonetheless, the plural of the former is mouses, and not mice. Similarly, and insofar as it is possible to resink the kitchen by way of providing it with a new sink, the past tense of that might end up being resinked, not resank (providing, thus, additional evidence for the relisting of the root).

In actuality, the strongest argument against his own system is provided in Kiparsky (1982b), where it is noted that e.g. deep freeze, the verb, cannot be derived from deep freeze, the noun, as freeze, on its own, does not occur as a noun. Deep freeze, as a verb, then, was never derived from a noun, but the past tense of deep freeze is deep-freezed, not *deep-froze, although, by assumption, the head of the compound, freeze, is the very same V otherwise occurring in non-compound contexts. An attempt to account for deep-freezed by appealing to a late compound formation, even if verbal, in turn rather flies in the face of the existence of compound verbal forms such as baby-sat (*baby-sitted). If baby-sat is a V-headed compound we have an explanation for the retention of the irregular past here, but the contrast with deep-freezed then becomes rather inexplicable. If, on the other hand, baby-sat is mediated through nominal compounding (plus back formation), we expect *baby-sitted, contrary to fact. The picture that emerges, then, suggests that insofar as a compound is headed by a root, idiosyncratic information is possible, and as is in the nature of idiosyncratic information, its occurrence is unpredictable. As always, in the absence of any idiosyncratic information, inflection will be expressed as default. The reader may wish to consult again the past tense for the verbal instantiation of input in (90), illustrating the fact that while regular inflection is certainly available, it is by no means mandatory, as would have been expected given the diachronic N→V derivational history of input.

7.5 Multi-Categorial Instantiations for C-functors: the Case of ING

As already noted in Chapter 4, English /\textit{ing}/ is the spellout of a number of rather syntactically and semantically diverse functions, including de-verbal nominalizer, gerundive marker, progressive (=active participle), and adjective:

(109) a. Vis\textit{iting} relatives is a nuisance. [gerund, GER]
b. The \textit{visiting} of relatives is a nuisance. [de-verbal nominalizer]
c. Vis\textit{iting} relatives typically stay too long. [adjective]
d. My relatives are \textit{visiting}/\textit{came visiting}. [active participle, progressive]

We note, specifically, that in each of these cases, /\textit{ing}/ spells out a distinct projection (GER, N, A, V-\textit{ptc}), although, rather non-trivially, all instances of ING merge with V.\textsuperscript{32}

\textsuperscript{32} Under the assumption, by and large orthogonal to the discussion here, that the C-core of gerunds is not N and that participles are a special case of V.
The categorial diversity of /n-ing/ occurrences as well as potentially similar cases of multiple categorial instantiations for functors have served, in turn, as the foundation for two rather diametrically opposed views which present a challenge to the perspective on C-functors and contextual categorization outlined in this chapter and in Chapter 6. The first challenge, emerging specifically from Beard (1995), focuses on the difference between the (descriptively) polysemous nature of -ing and the non-availability of such polysemity for what Beard refers to as “prototypical lexemes”. Since, for Beard, lexemes are the prototypical target of listing, the fact that no such polysemity is attested for lexemes argues for the non-lexeme, non-listed, and hence purely realizational, i.e. non-structural, nature of all instances of /n-ing/.

In order to evaluate this argument, it is worthwhile to point out that “polysemity”, for Beard, is specifically in reference to the identical phonological representation of /n-ing/, as clearly neither category nor semantic function could be (prima facie) equated. That this is the case also emerges directly from the fact that Beard proceeds to argue that the syntactically and semantically diverse instantiations of /n-ing/ could not be an instance of homonymy. In turn, lexemes, for Beard, are triplets. A lexeme for dance, under its verbal instantiation, would be as in (110a). The lexeme for, e.g., petrify would look pretty much the same, as in (110b):

\[
\text{(110) a. } /n\text{-dance/ } \triangleleft \text{V (___∅)} \triangleleft \text{DANCE}
\]
\[
\text{b. } /n\text{-petrify/ } \triangleleft \text{V (___N)} \triangleleft \text{PETRIFY}
\]

The claim, thus phrased, is of course fully compatible with XSM. In the model outlined here, the correlates of the representations in (110) are fully articulated and spelled-out syntactic structures, and hence cannot allow any more or any less polysemity than any other fully articulated spelled-out syntactic structure, such as, e.g., Did Mary eat the potato? (and see in this context Borer 2005a, where the exclusion of polysemity in the presence of syntactic structure is explicitly contrasted with the apparent “polysemity” of roots).33

Beyond the fact that in XSM the conjunction of properties in (110) requires the presence of a fully articulated syntactic structure, what is crucial is that in XSM there are no grammatically listed lexemes, but C-functors, such as ING, are definitely listed. Little evidence for the non-listedness of ING may come, then, from comparing it with lexemes.34 In turn, however, if there is some C-functor, call it ING, which is listed and which underlies all instances of /n-ing/, then we must ask whether its behavior tallies with that of items otherwise listed in XSM.

33 We note that insofar as for Beard himself lexemes are fully specified for their syntactic, semantic, and phonological properties, the following statement (Beard 1995, p. 34) is an oxymoron: “there simply are no prototypical lexemes belonging simultaneously to three distinct lexical classes”. In turn, once the term “lexemes” is replaced by unmarked stems, i.e. ‘roots’ in XSM, and “belonging” replaced with “categorially equivalent” it is (descriptively) false.

34 Content listing is available, and its pairing with structural output is perhaps the closest notion to “lexeme” in XSM. However, Content, crucially, is conceptual and extra-linguistic, rather than grammatical, and is in principle prevented from impacting any aspects of grammar, be they syntactic, semantic, or phonological. See Chapters 9 and 10 for a detailed discussion.
Other than functors of the C- and S- varieties whose distinct properties were already discussed in some detail in Chapters 1 and 6 (potentially augmented by particles: see Chapter 6, section 4), the only other potentially listed items in XSM are roots, by assumption the set of all occurring phonological indices and devoid of any syntactic or semantic properties (but see Chapter 9, section 2.1 as well as Chapter 8, section 1.3 on “unlisted” roots). At least one of the reasons for postulating the existence of such roots originates with the fact that the vast majority of otherwise morphologically unmarked stems in English display an alternation between nouns and verbs, a matter already discussed in some detail in section 7.3 (and see also Borer 2003b, 2005a, b). That this fact goes unnoted by Beard (1995) emerges directly from his assumption that in all such cases, one member of the pair is the (prototypical) lexeme, and the other is derived from it, although such derivational relations fail to be overtly marked (although, by assumption, and as in the system outlined here, no increased structural complexity for such derived forms ever results in Beard’s system). Unfortunately, however, once the possibility of unmarked categorial alternation is admitted, as in Beard (1995), it is no longer obvious what, in his system, would block a listed “basic lexeme” ING, with an unmarked alternation mapping it to other, by assumption non-basic and derived, categorial instantiations.

Ironically enough, and within the system outlined here, but not in Beard’s, that some occurrences of /ing/ are derived from others is prima facie extremely implausible, precisely because the sort of categorial alternation available for unmarked stems in English is suspiciously missing for overtly marked stems, an effect already discussed in sections 7.3 and 7.4. Thus while /dance/ may be the realization of both an N and a V, /petrify/ could not be N, nor can any other “lexeme” ending in /ify; ize; ate/. Within approaches that assume zero-marked derivations, directional or otherwise (with a zero-morpheme or otherwise), this generalization cannot be easily captured, as already noted, and Beard’s system is no exception. But if occurrences of /ing/ cannot be derived from each other, and if /ing/ corresponds to multi-categorial contexts, what is to tell us that it is a functor, and not, as would seem at least possible, a root?

Once stated this way, the existence of multiple functions realized as /ing/ becomes a very different sort of challenge, and one that has been articulated most succinctly by Lowenstamm (2010) and De Belder (2011) (although for the former not necessarily applicable to /ing/). Specifically, if, just like roots, so-called derivational categorizing suffixes may, in actuality, spell out distinct categorial contexts, what is to tell us that they are formally distinct from roots? Why not assume, instead, that they are roots, and that their distribution is governed by precisely the same conditions as otherwise govern the distribution of roots? At least prima facie, one could argue, viewing derivational categorizing affixes as roots would do away with having to list C-functors as operators with their own formal properties as distinct from those of S-functors and Extended Projections.35

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35 Lowenstamm (2010) and De Belder (2011) differ in their assumption with regard to categorizing. Lowenstamm’s proposal is that a combination such as [\FORM]+[\ATION] is categorized by the presence of a zero-realized n, to give rise to [\FORM]+[\ATION] n. We note that in that system, categorizers that
Suppose we consider from this perspective a preliminary list of properties we associated with C-functors, as in (111):

(111) C-functors:
   a. project a category  
   b. have a (unique) CCS  
   c. may have a phonological realization contingent on local root-selection  
   d. have a default phonological realization  
   e. may (but need not) have a semantic function

In attempting to analyze C-functors as roots, De Belder (2011) (and see also Lowenstamm 2010) focuses, primarily, on challenging the categorial projection of affixes, i.e. (111a). Specifically, she notes, of 143 categorizing affixes in Dutch, twenty-nine, or 20%, project more than a single category. A closer scrutiny reveals, however, that of the twenty-nine affixes under consideration, twenty-one are cases of affixes which are ambiguous between N and A. An even closer scrutiny reveals that typologically, ambiguous A/N affixes are extremely common (and attested in English, systematically, with -(i)an, -ist, -ory, and -i, as well as more idiosyncratically with -ic and -ant/ent; see Lowenstamm 2010 for some cases). Similarly common are CCS which are ambiguous between A and N instantiations (e.g. English -ize and en-, as well as the non-head of primary compounds). This systematic ambiguity, at the very least, suggests that when it comes to the A/N distinction, our categorial system may suffer from some inadequacies, and that a better classification may be able to derive this typological correlation (and see section 7.6 for some speculative discussion). As such, the array of categorical properties outlined by De Belder (2011) is a challenge, indeed: not to the categorial nature of C-functors as such, but rather to any labeling system which fails to capture the systematic relatedness of N and A, including, needless to say, the present system.

That said, it is also the case that many instances for which an A/N homonymy is typologically claimed are in actuality cases of an A modifying a null N (pro, specifically), thereby accounting for the equally common claim that in quite a few languages, most adjectives can be nouns, but not the other way around. The matter is investigated in some detail in Borer and Roy (2010), where semantic and syntactic tests were attach to such (compound) roots are perforce always $\emptyset$-realized. De Belder (2011), on the other hand, suggests, along the lines developed in XSM, that all “derivational” morphemes, roots in her system, are categorized in the context of the Extended Projections that dominate them much like “conventional” roots. See fn. 37 as well as text discussion for more relevant details of these systems.

36 One affix, Dutch -er, attaching, as in English, to both N and V, is provided by way of challenging (111b).
37 Lowenstamm’s (2010) argument for the root status of derivational affixes is centrally based on the attempt to give a principled account for the domain of stress shift in English. The tacit claim is, fundamentally, that the merger of two roots gives rise to stress shift. It is thus crucial, for his perspective, to correlate the absence of presumed category with the + status of the affix under consideration. To the extent that e.g. +an/ian or +ic may occur as both N or A, this effect is consistent with his predictions. What, however, is not predicted is the fact that an identical effect is attested with #ist where e.g. Trótskyist or activist may be both N or A, but the boundary is clearly # and no stress shift is attested. Nor can his system account for the multi-functions of -ing, a bona fide #-affix.
set up which distinguish between real N and an A with a null N head in French, Hebrew, Spanish, and English, ultimately yielding a considerably smaller class of ambiguous markings than is frequently assumed. Pending a closer investigation of the twenty-one putative N/A affixes in Dutch along such lines, it is not entirely clear how many of them do, indeed, pattern with English -(i)an or -ist, and how many pattern, rather, with -ous or -ed, where true nominal instantiations are extremely rare, but where we nonetheless do find expressions such as the curious/abused are less likely to win, attributable, according to Borer and Roy (2010), to the availability in such contexts of a (generically) interpreted pro.

Of the remaining eight affixes discussed by De Belder, five are preffixes with both nominal and verbal instantiations. Given, however, the questionable status of categorizing prefixes in Germanic altogether, as well as the fact that all instantiations in the data involve non-compositional Content and none with the same root, the status of the prefixes under consideration as categorizers rather than as prefixal modifiers of otherwise contextually categorized roots is not clear.

Insofar as there may be, in Dutch, three suffixes in a field of 122 (excluding ambiguous N/A alternations) which either have homonyms, or are altogether non-categorial and non-functorial, this appears to corroborate, rather than challenge, the claim that C-functors project a category.

A close investigation of the English affixal array reveals, likewise, that once we set aside cases that are ambiguous between A and N projection as well as reanalyzed roots such as question, structure, and portion discussed in section 7.4.4, the overwhelming majority of transparent suffixes in English (i.e. those that allow a clear separation between affix and presumed base), and with rare exceptions, project a single category (if they project a category at all, e.g. de-):

(112)  a. V only: -ize; -ify; -ate; en-; -en; be-; de-
   b. N only: -anc(y); -enc(y); -age; -ism; -ness; -ity; -ship; -hood; -ation
   c. A only: -ical; -ous; -ive; -able; -less; -ful

The list in (112) in turn could, and should, be augmented with -alN and -alA, which clearly do not constitute an ambiguous C-functor, but a case of genuine homophony. As I will show in Chapter 11, in Hebrew as well, multi-categorial projection outside the domain of A/N and A/V-ptc is practically at zero.

Once we turn to property (111b), we find that it is even more robust than property (111a). Specifically, /ing/ may spell out different categorial projections, but in all its instances its CCS is V. -(i)an, -ist, and -i may project either N or A, but across these differing projection possibilities their CCS remains constant, in this particular instance always as N. A perusal of the English derivational picture reveals that all the following affixes clearly have a rigid CCS.

(113)  a. V CCS only: -ance; -ence; -age; -able; -ive; -ation; -al
   b. N CCS only: -ate; -al; -ous; -ic; -ical; -ship; -hood; -less; -ful
   c. A CCS only: -ity; -ness
The following suffixes, in turn, select either N or A. Note that no other disjunctions occur systematically:

(114)  
a. V projecting; A/N CCS: -ize; -ify; en-
b. N projecting; A/N CCS: -ism

Across the board, no such properties are attested with roots. There are no categorial dependency relationships between roots and their complements (assuming they could have any), nor do roots cluster into such limited projection possibilities. At least from this perspective then, considering the array of affixes discussed here as instances of category-less roots appears to be the wrong move.

As it turns out, whatever pattern of categorial alternation is exhibited by C-functors, both within the domain of projection and within the domain of CCS, serves to undermine even further the attempt to reduce C-functors to roots, insofar as it departs radically and systematically from whatever flexibility is attested by roots. In English, the most common phonologically unmarked alternation by far is that which involves the co-existence of identical phonological representations for the V and N instantiations of a root, with the cases in (40) serving as but a small subset. Some occurrences of unmarked V/A alternations do exist (yellow, white (up), thin (out), etc.), but the alternation is not nearly as productive, a matter I return to in section 7.6. Except trivially (i.e. as names for themselves, e.g. yellow looks brighter when it is next to green), unmarked A/N alternations are not attested either. When we turn to categorial affixes, however, we find that (non-participial) V/A and V/N alternations, either in the domain of projection or in the domain of CCS, are virtually non-existent (ER’s CCS being the sole exception). \(-ing\), our multi-functorial starting point, we note, is no exception, in having an N and an A instantiation as well as a participial one, but no V instantiation (*to visiting). Instead, and like other categorizers, it displays an N/A alternation which is rarely attested with roots.

Note finally that if derivational affixes were roots rather than functors, then the natural comparison class to the properties of derivatives would be compounds, cases where the merger of two roots is clearly possible, and where, if roots can indeed merge with each other, such a merger would be hard to block. However, in sharp contrast with derivatives headed by (our) C-functors, and where the most common alternation is N/A, as already noted, root-headed compounds in English display precisely the same rampant V/N alternation as stand-alone roots, and an N/A alternation is altogether missing:

(115)  
a blackboard to blackboard *very blackboard
a chicken wire to chicken wire *very chicken wire
a table top to table top *very tabletop
(116)  
an American *to American very American
an existentialist *to existentialist too existentialist
an Iraqi *to Iraqi Iraqi enough

Finally, it is not obvious that the properties in (111c–d) are even stateable on roots. Even if one assumes, as indeed De Belder (2011) does, that roots are not phonological
indices but rather empty place holders, it is entirely clear that any local determination
of root spellout is rather limited. Roots do, indeed, have allomorphic variations, but
insofar as it could be said that {\textbackslash p\textsubscript{a}l; ous; ic; ical} or {\textbackslash p\textsubscript{a}tion; ance; ence; al; ment} are
all realizations of the same “item”, no such suppletive alternation is attested—or even
definable—within the root domain, and in fact suppletion of this type has been
argued to be the hallmark of functors (see Embick and Halle 2005).38

Suppose we conclude that the proposal to deprive C-functors of their categorial
status and their Categorial Complement Space loses more than it gains, and that a
system which allows them to hold on to their listed categorial specifications, both
in terms of projections and in terms of selection, is preferable, all the while bearing in
mind that listedness, in our system, is exclusively associated with functors and with
phonological informational packets, otherwise known as roots. How, then, can we
capture the varying categorial properties of what comes to be pronounced as \textbackslash p\textsubscript{a}ing?
How can we treat cases of multiple categorial instantiations of the same C-functor?

A second look at such multi-categorial instantiations reveals that they can be
divided, broadly speaking, into three types. In the first type, we find typologically
common correlations. Examples are correlations between V\textsubscript{ptc} and A, frequently
associated with the same C-functor. Two of the categorial variants spelled as \textbackslash p\textsubscript{a}ing/ fit
into this generalization insofar as active participles and adjectives are both \textbackslash p\textsubscript{a}ing/-
marked. Ultimately, any complete account of complex words would need to address
the correlations between adjectives and participles in a principled way. Accounts
which relate, derivationally, occurrences of participles and adjectives are certainly
available (including, in fact, one put forward in Beard 1995, but see also Bresnan 1978;
Levin and Rappaport 1986; Borer 1998; Kratzer 2000; Embick 2004; Agnastoupoulo
and Samioti 2012; as well as numerous others). No concrete attempt is pursued here,
but I will assume without further discussion that any such account would relate the
participial and the adjectival \textbackslash p\textsubscript{a}ing/ realizations. Turning to the systematic alternation
between A and N, I believe that, ultimately, an account should be found in fine-
tuning our categorial component, and, in particular, in gaining a better understand-
ing of the categorial nature of adjectives, altogether a rather poorly understood label
(and see section 7.6 for some speculations). Pending a more principled approach,
I will assume that the specification +N is a well-formed one, both for projections and
for selection, and that, e.g., a C-functor such as -(i)\textsubscript{a}n spells out a C-functor with
the properties +N[+N](\textbackslash C\textsubscript{a}+N[+N]).

In the second type, we find correlations which are not necessarily typologically
common, but which nonetheless could not possibly be random. In the context of the
discussion of the properties of ING in Chapter 4, I noted the non-accidental similari-
ty between the properties of the progressive and the properties of nominals derived
with ING. I further suggested that whatever differences emerge between them may be
due to their categorial nature, as well as the fact that the nominal instantiation
includes an Originator (specifically, as I shall argue in section 5 of Chapter 12, a covert

38 See Chapter 8, section 2.2 for more comments on possible suppletion within the domain of roots.
ER-like clitic). Adjectival occurrences of ING go altogether undiscussed in this work, but we note that if, as proposed in Chapters 4 and 12, ING has the semantic function HOMOGENEOUS, that characterization applies not only to the progressive and the nominal instantiation of ING, but to its adjectival instantiation as well. Although this matter will not be pursued here in detail, it is worthwhile noting that an immediate account suggests itself as concerning the way to capture the similarity, under the assumption that the same functor, ING, at the very least with a V CCS and with a HOMOGENEOUS function, is involved for all three. According to this account, ING is categorically altogether underspecified, having the representation ING_{C[v]}, and where C is constrained so as to exclude instances of [−N]. If on the right track, both nominal and adjectival instantiations of ING_{C[v]} would be rendered ± V-equivalent in the contexts of the ExP-segments that dominate them, themselves members of {Ex[N]} and {Ex[A]} respectively. The progressive instantiation, on the other hand, would derive its full categorial properties, specifically participial ones, from being an ExP-segment within an {Ex[V]}. If correct, it emerges that ING, with a strict and constant HOMOGENEOUS semantic function but with underspecified categorial projection value, is ambiguous between a C-functor and an S-functor. Under the first instantiation, it will have a CCS and it will project, albeit a derived category. Under the second, S-functor, instantiation, it is [−N], to be sure, but whatever additional categorial value it may appear to have in actuality emerges from being a member of {Ex[V]}. Like other S-functors, it will fail to project, but will be implicit in assigning range to some ≔[e], and by deriving a categorial label for ≔[c] specifically such that it is compatible with {Ex[V]}. It is thus precisely the underspecified categorial nature of ING together with the fact that it has a verbal CCS that allows it to straddle the middle ground and occur as both C-functor and S-functor.

The emerging picture is intriguing. We note, specifically, that if we were to assume that ING must project a specific category, say N, this would exclude it as an {Ex[V]} segment, disallowing the unification of the progressive and the nominalizer. We note further that the existence of a common CCS, V, is clearly an unproblematic constant, insofar as the S-functor instantiation, the progressive, does have a verbal CCS, albeit indirectly. We note finally that precisely because C-functors are not barred from having a semantic function, ING may have one, alongside its categorial one, yet again allowing it, in that sense, to overlap with the always present semantic function of S-functors. The shared properties of ING across its C- and S-instantiations now emerge as the maximal set of properties that can co-occur in the presence of a common semantic function without violating the conditions on the properties of either functor. The picture that emerges is very broadly as in (117):

\[
\begin{align*}
[\text{c} \text{ ING}_{C[v]} [c=v]] &\leftrightarrow [\text{PROG ING}^{\text{PROG}} \llcorner e \llcorner^{\text{ING}^{\text{PROG}}} \llcorner e \llcorner^{\text{PROG}} [c=v]] \\
[\text{ING} \in \{\text{Ex[A]}: [x \text{ ING}_{v}[c=v]]\} &\leftrightarrow [\text{PROG ING}^{\text{PROG}} \llcorner e \llcorner^{\text{ING}^{\text{PROG}}} \llcorner e \llcorner^{\text{PROG}} [c=v]] \\
[\text{ING} \in \{\text{Ex[N]}: [x \text{ ING}_{v}[c=v]]\} &\leftrightarrow [\text{PROG ING}^{\text{PROG}} \llcorner e \llcorner^{\text{ING}^{\text{PROG}}} \llcorner e \llcorner^{\text{PROG}} [c=v]]
\end{align*}
\]

(117)
Finally, in the third type of multi-categorial instantiations for the same phonological representation, we find what we must conclude is a random homonymy. One such example would be /πal/ as the realization of both C_A[N] and C_N[V]. While the phonological realization here is identical, the properties differ along all possible dimensions, with different projecting category, different CCS, and with the adjectival -al but not the nominal -al being a default option. Returning to /πing/, this, I believe, is the best account for its occurrence as the head of English gerunds. Typologically, the correlation is not attested. While we could establish semantic links among nominal, adjectival, and participial ING, no semantic links connect any of these instantiations to the gerund, as already argued in some detail in Chapter 4. Thus, while ING_{GER[V]} may represent function “skipping”, in the sense of Beard (1995), in other words a form of “exaptation” of an affix to do a job in a distinct grammatical context, such skipping shows neither typological nor semantic continuity, forcing us to conclude that in present-day English, it remains a random phonological correlation. A true homonymy.

### 7.6 The Puzzle of the Adjective

Adjectives, to all intents and purposes a well-defined categorial class, nonetheless present an enduring categorial puzzle for any systematic look at categories. From the present perspective the puzzle is multi-dimensional, as numerous distinct diagnostics that have been described and elaborated on in the previous chapters appear to apply fairly systematically to nouns and verbs, but not to adjectives. Some aspects of the puzzle were already noted in section 7.5. These concern the fact that across the board, the distinction between A and N within the domain of word formation is not nearly as easy to draw as one would expect. We thus noted that a myriad of affixes in English as well as in Dutch are systematically ambiguous between N and A and that CCS are frequently ambiguous between N and A as well. Finally, the non-head of English primary compounds is similarly ambiguous between A and N, all suggesting that some fundamental property of A and its relations with N is going theoretically unrecorded here.

A considerably more baffling behavior, however, emerges when we consider the fact that in some important respects, all adjectives, including monosyllabic ones, behave as if they are already fully categorized and possibly complex forms, in that none of the diagnostics that were associated with roots and root behavior in the previous chapters seem to apply to them, and rather, the converse is the case: many of the properties that were associated with complex derivatives do apply to adjectives, including ones that appear, to all intents and purposes, to be extremely structurally simple.

Among the diagnostics of roots outlined in the previous two chapters, one of the primary ones is the possibility for roots, and roots alone, to occur as both N- and V-equivalents, contingent on their structural context. By way of highlighting the first distinction between adjectives, on the one hand, and instances of N and V on the other, we note that this is not the case for A. Roots that may occur freely as both
V-equivalent and N-equivalent, rarely, if ever, occur as A-equivalent. Items, possibly roots, that occur as A-equivalent rarely, if ever, occur as N- or V-equivalent: 39

(118) a. a dance b. to dance c. *too dance
    a jump to jump *too jump
    a walk to walk *too walk
    a table to table *too table
    a chair to chair *too chair
    a wardrobe to wardrobe *too wardrobe
    a question to question *too question

(119) a. *a mean b. *to mean c. too mean
    *a green *to green too green
    *a fat *to fat too fat
    *the tall *to tall too tall
    *a smart *to smart too smart
    *a wide *to wide too wide
    *a big *to big too big

We note that the problem here goes beyond the issue of the existence, or lack thereof, of zero categorizers. If, as Distributed Morphology would have it, categorization is mediated through the existence of categorially labeled nodes potentially realized as zero, the question relative to (118)–(119) becomes that of ruling out the cases in (120a) and (121b–c) but ruling in (120b–c) and (121a):

(120) a. *[a [√DANCE]] *[a [√CHAIR]]
    b. [v [√DANCE]] [v [√CHAIR]]
    c. [n [√DANCE]] [n [√CHAIR]]

(121) a. *[a [√GREEN]] [a [√BIG]]
    b. *[v [√GREEN]] *[v [√BIG]]
    c. *[n [√GREEN]] *[n [√BIG]]

At least relative to the categorial malleability of roots, however described, adjectives seem to part ways with nouns and verbs. When we turn to other properties of roots, matters proceed along extremely similar lines. Consider, specifically, the claim advanced in Chapter 6 as well as in Embick (2010) that roots may locally select their inflectional realization. When considering adjectives in the light of this claim, we note the striking absence of any item-specific realization associated with adjectives in English as well as in other languages. Adjectival bound inflection is attested, specifically as comparative and superlative forms. What is entirely missing, however, is any trace of root selection in determining the form of such bound inflection. Rather, across the board, the comparative is systematically -er and the superlative is systematically -est.

39 We do, of course, have to thin as well as to yellow. However, it is entirely clear that there is no general process here, and that to the extent that yellow and thin, but not red and fat occur both as adjectives and as verbs, the correlation cannot be predicted and must be listed as such.
One could object that the absence of variation, in itself, is hardly an argument, and that the failure of exceptions to emerge is hardly, in itself, a significant theoretical result. What is however noteworthy is that “exceptions” are, in actuality, attested in the domain of adjectival inflection in English, in exactly four cases—those associated with good, bad, many, and little, where we find both stem suppletion and stem allomorphy:

(122)  
- a. good better best  
- b. bad worse worst  
- c. many more most  
- d. little less least

Several things are noteworthy about the paradigm in (122). Clearly two distinct (phonological) roots are implicated here, one which underlies the uninflected form and the other which underlies the two inflected forms. While the relationship between e.g. \(/_n\text{good}\) and \(/_n\text{better}\) is arguably a case of suppletion, that which regulates the relationship between e.g. \(/_n\text{better}\) and \(/_n\text{best}\) appears, rather, to be a case of stem allomorphy. Cases such as those in (122) are subject to an extremely interesting study in Bobaljik (2007, 2011), who shows on the basis of a broad range of languages that the suppletion in cases such as those in (122), if attested, always emerges as a distinction between the root underlying the basic adjective and the root underlying both the comparative and the superlative form. In what is more significant to our central point here, however, he also shows that by and large, cases of suppletion as well as cases of root allomorphs in comparatives and superlatives are extremely rare, and tend to affect, in language after language, the same items—good, bad, many/much, few/little, big/great, and small. In many a language, no irregular inflection is associated with adjectives at all.

The rarity of root-selected allomorphic realizations in the comparative/superlative paradigm notwithstanding, it is now clear, on the basis of the typological data, that it is, in principle, possible. The question that we therefore must ask is why it is so rare, and why it affects exactly the forms that it does. Why not a root-conditioned comparative for kind, or nice, or open? At least a partial answer, as given by Bobaljik himself as well as that suggested by Embick and Halle (2005), is that suppletion, as such, is a property of Vocabulary Insertion (within DM), or, in the terms used here, a property associated with the realization of functors; and that the specific adjectives that do allow suppletion all fall, at the very least, within the area of “light” adjectives, and are possibly straightforwardly functorial. The restriction of suppletion to functors is one I have endorsed here, being a direct entailment of the claim that there exists a common functor which I have labeled ATK and which allows the clearly suppletive set of realizations in \{-ation; -ance/-ence/-ancy/-ency; -ment; -al\}. Roots, in contrast, come with a phonological index which effectively ensures some measure of faithfulness, but which nonetheless may contain information on stem allomorphy (and see Chapter 8 for an explicit discussion). If on the right track, then, the narrow set of adjectives that allow suppletion consists of functors. That many/much or few/little are functors goes without saying. That good/bad or small/big might be at least in some sense “light adjectives” and thus functional is certainly plausible. Nonetheless, and beyond suppletion, we note that the relevant paradigm exhibits also root-conditioned allomorphy, as in worse–worst or better–best. The question thus becomes why it is that there are
no **non-functional** adjectives which show any such stem allomorphy. Why no *fat/fester/fest* or *thin/thinn/thonst*, or any other imaginable allomorphic change? To draw a comparison with V and N, suppletion occurs for verbal auxiliaries as well as for *go–went*, the latter at least possibly a light verb, but is otherwise entirely absent in the verbal domain of English. What is however rampant in the verbal domain of English is inflection-induced stem allomorphy. Within the nominal domain, suppletion is non-existent (in English) to the best of my knowledge, but stem allomorphy under inflection certainly is present. When we turn to adjectives, we find, however, an empty slot—it is that slot which thus gives rise to our puzzle:

(123)  

<table>
<thead>
<tr>
<th>Suppletion</th>
<th>Stem allomorphy (including irregular inflectional marking)</th>
</tr>
</thead>
<tbody>
<tr>
<td>functional V</td>
<td><em>is/were/be</em></td>
</tr>
<tr>
<td></td>
<td><em>(go/went)</em></td>
</tr>
<tr>
<td>V</td>
<td><em>(go/went)</em></td>
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<td></td>
<td></td>
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<tr>
<td>N</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>functional A</td>
<td><em>many/more</em></td>
</tr>
<tr>
<td></td>
<td><em>good/better</em></td>
</tr>
<tr>
<td></td>
<td><em>bad/worse</em></td>
</tr>
<tr>
<td></td>
<td><em>little/less</em></td>
</tr>
<tr>
<td>A</td>
<td></td>
</tr>
</tbody>
</table>

Suppose, however, we switch our terms of discussion, and compare adjectives not to V-equivalent and N-equivalent roots, but rather to V and N derivatives. Once such a perspective is considered, the properties of adjectives become entirely clear. V and N derivatives, recall, do not undergo an unmarked category shift. *Verbalize* is a verb, *sisterhood* is a noun. A *verbalize* or to *sisterhood* are excluded, as in the absence of zero categorizers their categorial specification is fixed, and cannot be changed. If items such as *mean*, *small*, and *green* are not roots, but rather derivatives, categorized instances of A, then the paradigm in (119) becomes entirely coherent. If *mean* is, in actuality, not an instance of *[π√mean]*, but rather an instance of *[a mean]*, an attempt to render it N or V cannot be successful without overt affixation. Specifically, embedding *[a mean]* under some {Ex[V]} or {Ex[N]} segment would result in direct ungrammaticality due to a categorial clash:

(124)  

a. *[Exp-N the [c=N [a mean]]]  

b. *[Exp-V will [c=V [a mean]]]  

The accommodation of the ungrammaticality of (118), in turn, requires an even stronger statement. Not only are expressions such as *mean* and *nice* already

---

40 Suppletion within the nominal domain has been claimed for Uto-Aztecan languages. I return to this matter as well as to suppletion in general in Chapter 8, section 2.1.
categorized, but adjectives are effectively “born” as such, and may not be contextually derived. There are, effectively, no A-equivalent constituents which are not already concretely headed by A. It is only in this manner that we can exclude the ill-formed adjectives in (118). Here, a category-less root, e.g. [\(\sqrt{\text{DANCE}}\)], would happily become V-equivalent or N-equivalent in the relevant context. It cannot, however, become A-equivalent. The dominating Extended Projection, by assumption \{Ex[A]\}, appears powerless to turn it into an adjective. By assumption, with the root failing to become A or A-equivalent in such cases, the derivation collapses in the absence of a suitable instantiation of a categorized A as a C-core for \{Ex[A]\}:

\[
\begin{align*}
\text{a. } &\left[\text{Exp-A too } [\sqrt{\text{DANCE}}] \right] \\
\text{b. } &\left[\text{Exp-A too } [\sqrt{\text{TABLE}}] \right]
\end{align*}
\]

When we turn to the interaction of adjectives with inflection, we find that yet again a comparison with derivatives, rather than roots, yields the correct result. Stem allomorphs and irregularity of marking, recall, were a prerogative of roots. Derived forms, in turn, never showed any stem allomorphs or irregular marking of any sort. Insofar as adjectives are always regular, yet again they behave here as derivatives, and not as roots:

\[
\begin{array}{ccc}
\text{Derived V} & \text{Derived N} & \text{A} \\
\text{-ed only:} & \text{-s only:} & \text{-er; -est only:} \\
\text{recognized qualified} & \text{formations sisterhoods} & \text{kindest greenest fattest} \\
\text{qualified instantiated} & \text{paintings drivers entities} & \text{smartest brighter sharper} \\
\text{lengthened enboxed} & & \\
\end{array}
\]

Finally, recall that the choice of C-functors as well was susceptible to root selection. Realizations of \(C_{N[V]}\) such as -ance/ence, -al, and -ment could only be root selected; as were \(C_{A[N]}\) realizations such as -ic (-istic notwithstanding) or -ous, and \(C_{V[N/A]}\) realizations such as -ify or -ate. In all cases where multiple realizations were associated with the same C-functor, one realization was the default one, insofar as that was the one that would emerge in the absence of selection, and so, perforce, in all cases in which the root could not exercise a selection, being embedded within a derivative. For \(C_{N[V]}\) that was -ation, for \(C_{A[N]}\) it was -al, and for \(C_{V[N/A]}\) it was -ize. In view of this, consider the range of realizations associated with \(C_{N[A]}\) functors which attach to adjectives, and specifically to monosyllabic adjectives, the prima facie best candidates for underived, mono-morphemic roots:

\[
\begin{align*}
\text{a. } & C_{N[A]} \\
& +ity [\text{Latinate base}] \\
& #ness
\end{align*}
\]

We note, first off, the fact that when compared with ten or so (including ER) available for \(C_{N[V]}\), only two nominalizers are available for adjectives.\footnote{I assume that whatever relationship holds between -ance/ence nominals and -ant/ent adjectives does not consist of deriving the former from the latter. Specifically for our purposes, then, -ance/ence are not realizations of \(C_{N[A]}\), but rather realizations of \(C_{N[V]}\). The correlation is best analyzed, I believe, as an independent affixation of \(C_{A[V]}\) and \(C_{N[V]}\) to the same root, raising the possibility that both -ance/ence and -ant/ent are in actual fact complex, portmanteau morphemes, consisting of one component that is common and is realized as
Even more significant, however, is the fact that once we take into account phonological restrictions such as boundary type and the need for -ity to combine with a Latinate base, we find that both -ity and -ness attach to any base, derived or underived. Fabb (1988) explicitly lists -ness as attaching to every possible A-derived base. -ity, in turn, is specified by Fabb as occurring in the context of six A-affixes, a set that consists of all Latinate suffixes, and excludes all Germanic stock (e.g. -ful; -less; -ed/-en; etc.). Within the boundaries of the phonological restrictions placed on them, then, both -ity and -ness are default forms and cannot be assumed to be root selected:

(128) a. avail-able-ity; gull-ible-ity; por-o(u)s-ity; lumin-o(u)s-ity; grammat-ical-ity; transit-ive-ity; electr-ic-ity; operation-al-ity; superi-or-ity; ban-al-ity; line-ar(y)-ity; exempl-ar(y)-ity
b. acid-ity; able-ity; agile-ity; chaste-ity; clar-ity
c. capac-ity; contigu-ity; credul-ity

(129) cur-able-ness; vis-ible-ness; courage-ous-ness; grammat-ical-ness; attent-ive-ness; exot-ic-ness; sugar-y-ness; obligator-y-ness; air-less-ness; spoon-ful-ness; gar-ish-ness; Engl-ish-ness; Australi-an-ness; relat-ed-ness; brok-en-ness

Especially in contrast with the massive evidence for root selection for the realization of C_N[V] functors, we note, what emerges for C_N[A] realizations is that only default forms are available, merging equally successfully with what looks like derived forms and what looks like roots. We note that while -ity, but not -ness, do so occur with some bases that are not independently attested, these facts are easily reducible to the boundary distinction between #ness and +ity, and cannot serve as evidence for (individual) root-selection as such. To drive home the point, consider the rather graphic comparison between the array of C_N[A] functors, on the one hand, when contrasted with the array of functors which do not take A as their CCS:42

an/en, and an additional component that is specifically either an N-functor (realized as /e/,/el/ or an A/(N)-functor (realized as /a/). Similar considerations may apply to IST/ISM. See fn. 37 of Chapter 9 for a brief discussion.

We note in this context that neither -ity nor -ness attach to -ant/ent. Similarly, neither attaches to -ist. Insofar as the restriction cuts across both affixes, it confirms their similar default status. In turn, an explanation for these particular exclusions must reside in appealing to the specific relationship that holds between -ant and -ance and -ent and -ence, or between -ist (in its adjectival instantiation) and -ism.

42 C_A[v] are absent from the table in (130) as their distribution is altogether too complex to lend itself to an easy characterization. At least ABLE_A[v] and ISH_A[v] are semantic functions associated with a phonological index, and the distribution of ed/en is altogether confounded by its participial role (but see Embick 2004 for a skillful treatmen). Finally, determining a default relative to the -y, -ory (if a single affix rather than or-y), -ary, and -ive is a tricky matter. All attach to some derived forms (classificatory; classificatory; neighborhood; revolutionary), but are nonetheless not free, making the category as a whole somewhat of a misfit in the general picture outlined here. We do note, nonetheless, that insofar as the category as a whole makes the establishment of a default extremely difficult and might suggest massive root-selection effects, if anything it presents the sharpest contrast to the distribution of C_N[A], where only default is in evidence.
Against the proliferation of root-selected realizations for N[V], for V[N], for A[N], and for A[V] (see fn. 42), the absence of any root-selected realizations for N[A] is quite striking. It does follow, however, in an entirely direct fashion, should it emerge that root selection for adjectives is absent quite simply because adjectives are already perforce derived and categorized at the point at which they merge with C_N[A]. If the consultation of a root for any affixation to A is in principle never possible, it is hardly surprising that the language fails to have any realizations that are contingent on such root-based information. It thus emerges that within the domain of C-functors as well, adjectives, even when they appear mono-morphemic, behave as complex, derived forms.

The view of adjectives as inherently derived, however, is not entirely straightforward, and a couple of problems do emerge, specifically, within the domain of C_V[A] functors. Consider first -en, not a default form, and hence, by assumption, root selected. However, if adjectives are inherently derived, this classification cannot be maintained, and must be replaced by a phonological description (which, in actuality, is the standard practice, barring -en from merging with any bi-syllabic structures). If -en is not an instance of root-merger, however, this would require a rethinking of the claim, in section 7.3.4, that length, strength, and height are root allomorphs of long, strong, and high, specifically conditioned either in N-equivalent contexts, or by the presence of a phonologically restricted affix such as C_V[A] when realized as /en/. If adjectives are always derived, access to root information is not expected under either scenario (although, note, a realization as growth or death would still be available in an N-equivalent context, as neither grow nor die could possibly be related to an adjec-
tival source, derived or otherwise, and are rather the default realizations of the bona fide roots \( \sqrt{\text{grow}} \), \( \sqrt{\text{die}} \)).

The second problem emerges when we note that at least -ify and en-, both by assumption root-selected and barred in the context of overtly derived adjectives, can merge with (plausible underived) adjectives (as well as nouns) (cf. 131). If, however, adjectives are inherently derived, then such an asymmetry between overtly derived and non-overtly derived instances of A is not expected, and what is expected of instances of C_V[N] is, as in the case of C_N[A], the occurrence of default forms alone, on a par with -ess and -ity. We note that here, a phonological statement barring the merger of -ify or en- to overtly derived forms is implausible: 43

43 As noted already in fn. 35 of Chapter 6, the total list of -ate realizations of C_V[A] in the context of derived A is as in (i). I have been unable to find bona fide cases of -ate merging with (plausibly) underived adjectives:

(i) (de)activate; captivate; cultivate; titivate (motivate; salivate)
 Altogether, then, and paradoxically enough, it appears that while $C_{v[A]}$ may merge with a root and render it A-equivalent, such an operation is possible neither for instances of $C_{N[A]}$ nor for any ExP-segments.

Having given the outline of the Puzzle of the Adjective here, its resolution must nonetheless await future research. The picture does suggest, however, that something rather fundamental about the category of adjectives is going amiss in present-day categorial typologies, which can be captured neither by the categorial feature system originally in Chomsky (1970), nor by the categorial system expounded in Baker (2003).
8

Taking Root

8.1 On the Phonological Reality of Roots

As already noted briefly in Chapter 1, the existence of C-functors together with the assumption that they project syntactically and define a Categorial Complement Space commits us to the grammatical reality of whatever it is that such C-functors merge with. The Exo-Skeletal Model shares with Distributed Morphology the assumption that the (first) element which merges with a functor is a root: a (potentially) listed, underived item which is otherwise devoid of category. Beyond specifying that it may be, in some sense, listed, underived, and devoid of category, however, the properties of the items that we call here “roots” are not by any means self-evident or generally agreed upon, even within syntactic approaches to the formation of words, nor do approaches agree on what is or is not “derived”, or on the formal nature of the listing under consideration.

The grammatical reality of the root notwithstanding, the first question that comes to mind concerns the status of bare roots as well-formed syntactic objects. We note, specifically, that within the categorial equivalence system outlined in Chapter 7, bare roots may be part of the initial array and as such may merge with functors or possibly with other roots (e.g. in the case of compounds, see Chapter 6, sections 1.2 and 2, as well as Chapter 12), but subsequent to their merger they are (eventually) rendered category-equivalent. It thus emerges that in XSM category-less entities are not in and of themselves syntactic objects. The elusiveness of roots, however, goes beyond their syntactic realization. Even in a language such as English, in which the root, or what we typically assume to be the root, frequently appears identical to an attested phonological word, otherwise phonologically identical nouns and verbs may have different stress or voicing patterns ([prógress] vs. [progréss]; [thief] vs. [thieve]), indicating, presumably, that it is not the root as such that is spelled out, but rather its categorized instantiation. Plausibly, an uncategorized root is not a well-defined structural domain and hence cannot constitute an appropriate domain for spellout, but such a conclusion directly begs the question of whether an uncategorized root is in any sense grammatically real, and what evidence can bear on showing that it is.\(^1\) The matter is, of course, considerably sharper in Semitic languages,

\(^1\) Note, in turn, that if roots are allowed as uncategorized terminals in syntactic representations, as in DM, the question becomes what, exactly, bars their independent spellout. Specifically, suppose thief is the
where roots, arguably, are a string of consonants which cannot give rise to a licit phonological representation at all without the addition of vowels, and where the added vowels, perforce, spell out additional syntactic structure which inevitably gives rise to a licit phonological representation in ride a car, ride a horse, vs. rekeb ‘vehicle’ etc.). Proponents of roots, present author included, would hasten to point out that insofar as /p prógress/ and /p progréss/ or /p thief/ and /p thieve/ are presumably related to one another, and that insofar as /v rakab/ and /n rekeb/ are likewise presumably related, such relatedness would be hard to characterize without a common source. But what, exactly, such a common source consists of and what, exactly, its grammatical status is, is by no means obvious.  

Given the distinct categorical properties of the pairs under consideration here, and given the fact that there is no direct syntactic derivational relationship between them, as argued in some detail in Chapter 7, we note that if the pairs under consideration are indeed related through the existence of a common source, such a common source could, in principle, be either phonological or Content related or both. In Borer (2003b, 2005a, b) I already suggest that any Content associated with roots is grammatically inert. Here, I go the extra step to claim that roots, as such, are devoid of Content altogether, and that Content assignment, or rather matching, is to phonological representations which are oblivious to notions such as “root”, however construed. Differently put, and as will be noted in Chapter 9, there certainly is a relationship between phonological representations and Content, but that relationship is not reducible to the properties of units that we may refer to as “roots”. But if roots do not have Content as such, and furthermore, if (final) spellout always applies to already categorized constituents, as appears independently plausible, what grounds could there be for claiming that roots are altogether real, or that pairs such as /v rakab/ and /n rekeb/ or /n prógress/ and /v progréss/ are related to the same root? And indeed, at least one recent proposal (cf. Ramchand 2009) dispenses with roots altogether, arguing rather that if roots do not inform any syntactic or semantic operations, and if phonological spellout is not based on roots alone, then there is little to be gained from assuming roots to exist in any grammatically meaningful sense whatsoever.

spellout of n+/√THIEF, while thieve is the spellout of v+/√THIEF. This would certainly account for the attested forms. However, to be complete, the account would need to be supplemented by the stipulation that √THIEF, although a syntactic terminal and although possessing phonological properties may never spell out as such, and by extension, nor can any root. The problem, we note, is in actuality considerably more severe for Harley (2009a, b), where roots are not just terminals, but may also project (and see also Embick 2004).

2 Crucially, there is no direct derivational relationship between the verbal form /v rakab/ and the nominal form /n rekeb/ (the former is not a de-nominal verb in any morphologically coherent sense, nor is the latter a de-verbal nominal). That prógress and progréss as well as thief and thieve are each root-related, rather than zero-derived from each other, was in turn a matter discussed in some detail in Chapter 7.

3 Roots, as just noted, are not in themselves syntactic objects. Thus even if syntactic structure were crucial to Content matching, it would nonetheless remain the fact that such Content matching could not be mindful of roots, as such.
As it turns out, however, while (uncategorized) roots, as such, do not constitute a spellout domain, nor are they syntactic terminals, they nonetheless do have properties which range over all their occurrences, warranting their existence. These properties, furthermore, are fundamentally phonological. Clearly, insofar as /pthief/ and /pthieve/ are phonologically distinct, a root which is implicated in giving rise to both can be neither one. It could, however, be a phonological index, by which we mean a reference constant across all occurrences to a specific phonological information packet, where both /pthief/ and /pthieve/ could be accessed under the relevant syntactic circumstances, and where principles of phonological faithfulness would ensure some threshold of phonological relatedness, however defined. The remainder of section 8.1 is devoted to showing that roots do, indeed, constitute reference to specific phonological information, covering potentially multiple categorial instantiations. Given the fundamental phonological nature of roots, a general discussion on issues concerning the role of phonology, or morpho-phonology, as it is sometimes referred to, is warranted, which is in turn undertaken in section 8.2. Specifically, I argue that any attempt to abstract away from phonological properties in the search for syntactic consistency within the area of morphology can only be accomplished at the cost of altogether denying the existence of the subject matter under inquiry. A “morphology” without “morpho-phonology” is, in other words, an oxymoron. Issues of roots and Content, or lack thereof, are discussed in sections 8.3 and 8.4.

That the smallest building blocks of (non-functorial, substantive) morphology are units of sound (potentially bigger than segments) which need not correspond to Content is a point already made in some detail in Aronoff (1976). Aronoff’s argument is divided into two parts—one part consists of showing that substantive morphemes in isolation, e.g. straw, may be phonologically well defined but still not have consistent Content across their occurrences (e.g. strawberry). This observation is at the heart of the claim that roots are not Content units as such, a matter I will return to in sections 8.3 and 8.4. Suppose, however, we set this matter aside, and focus rather on the other part of Aronoff’s argument—the existence of units which are clearly bigger than segments (and hence cannot be pure “phonological” atoms), but which nonetheless can only be characterized relative to their (combined) phonological properties. These phonological properties are consistent across all their occurrences, but definitely and clearly do not amount to Content.

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4 Embick and Halle (2005), within the framework of Distributed Morphology, likewise appeal to the existence of (underlying) phonological properties specifically associated with roots, crucial, as it turns out, to the determination of the correct phonological instantiation of verbs within the Latin verbal paradigm. The formal properties of the inflectional system utilized in that model are however sufficiently different from the notion of inflection developed here (cf. Chapters 1 and 6), for the restatement of the execution in terms of XSM to take the discussion too far away from its main focus. Insofar as the account does require a (final) spellout in consultation with root-specific phonological information, however, we note that it is certainly consistent with the approach under development here. Similar considerations apply to at least some aspects of the locality model developed in Embick (2010).

5 Cran morphs are specifically avoided, insofar as one could claim that cran does (trivially) have Content, but is a bound form of some sort and with limited distribution. That objection cannot possibly be leveled at the stems of prefixed English forms, or at Semitic consonantal roots.
8.1.1 Allomorphs in compound roots

Consider, in this context, the Latinate prefix-stem verbs already discussed in some detail in section 2.5 of Chapter 6, and specifically the partial sample given in the table in (1) (and with forms in parentheses indicating unclear state of attestation or a potentially different stem):

<table>
<thead>
<tr>
<th>BASE</th>
<th>JECT</th>
<th>DUCE</th>
<th>SUME</th>
<th>CEIVE</th>
<th>SCRIBE</th>
<th>MIT</th>
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<tr>
<td>pfx</td>
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<td>de</td>
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<td>sub</td>
<td>sub</td>
<td>JECT</td>
<td>DUCE</td>
<td>SUME</td>
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<td>trans</td>
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<td>DUCE</td>
<td></td>
<td>CEIVE</td>
<td>SCRIBE</td>
<td>MIT</td>
</tr>
</tbody>
</table>

What is of note for the stems in (1) is the fact that in isolation, they have no Content whatsoever in present-day English, and that any attempt to conjecture a common Content on the basis of their occurrence is doomed to failure. *Scribe* (as well as *script*, note) is a particularly interesting case, insofar as it actually does occur as a free-standing form in English with a very specific Content. While *transcribe* might still bear some Content relatedness to that free-standing form, insofar as some writing seems to be implicated, this is hardly the case in *subscribe* or *ascribe*, and while there is some potential Content suggestion of relatedness in *describe*, the relationship falls rather short of being in any sense predictable. *Duce*, *mit*, *sume*, and *ceive* simply have no Content whatsoever.

As Aronoff (1976) notes, one could suggest that the forms under consideration are simply no longer related in any way, having been integrated into words that may have been derived and complex once, but no longer are sensibly so. The main reason to assume that this is not the case is that phonologically, and only phonologically, the forms share important properties. Not only are they phonologically identical across different prefixation combinations, but they also have, where relevant, identical allomorphs attested in identical morpho-phonological contexts.6

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6 Note the existence of some allomorphs where otherwise not conditioned, e.g. such as *accept*, *transcept*, *deduct*, *conduct*, and others. The situation, as it turns out, dates all the way back to Latin, where such dual verbal forms were already attested, and they likewise exist in all Romance languages.
It is extremely hard to see how the allomorphic generalization can be stated away from the existence of some unit which all of these compounded forms have in common—and yet, that common unit can only be described in terms of its phonological form. It thus emerges that we must allow the existence of units that are smaller than “words”, whatever they turn out to be, that are devoid of Content, and that may not be free-standing, but which are nonetheless bigger than segments, and have consistent phonological properties across all their occurrences.\textsuperscript{7,8}

\textsuperscript{7} In Chapter 9, section 2.1, I will argue specifically that the domain of Content is such that free-standing (non-functor) forms must have Content, or give rise to nonce, Jabberwocky-type vocabulary. Specifically, they cannot combine with any other grammatical terminal to give rise to combined, non-compositional Content. Insofar as Latinate stems are not free-standing, the absence of Content in isolation, but its recovery in a larger context, is certainly consistent with this claim.

\textsuperscript{8} Šekauer (2000) explicitly challenges Aronoff’s (1976) conclusion, adopted here, that the smallest (non-functional) building block of word formation need not correspond to Content units. Basing his

\begin{table}
\begin{center}
\begin{tabular}{lcccc}
\hline
 & MIT & DUCE & SUME & CEIVE & Scribe \\
\hline
Ad-duce & ad-duce & as-sume & as-scribe \\
Con-mit & de-duce & con-sume & con-ceive & con-scribe \\
De-duce & \textit{de-duce} & de-ceive & de-scribe \\
E-mit & in-duce & \textit{in-duce} & \textit{in-scribe} \\
O-mit & pro-duce & pre-sume & pre-ceive & pre-scribe \\
Per-mit & re-duce & re-sume & re-ceive & re-scribe \\
Re-mit & sub-duce & sub-sume & sub-scribe & sub-scribe \\
Sub-mit & \textit{(trans-ceive)} & \textit{trans-scribe} & \\
\hline
\end{tabular}
\end{center}
\end{table}

\begin{table}
\begin{center}
\begin{tabular}{lcccc}
\hline
 & MIT & DUCE & SUME & CEIVE & Scribe \\
\hline
Ad-mis & ad-duct & as-sumpt & \\
Con-mis & de-duct & con-sumpt & con-cept & con-scribe \\
E-mis & in-duct & de-cept & de-scribe \\
O-mis & pro-duct & pre-sumpt & per-cept & pre-scribe \\
Per-mis & re-duct & re-sumpt & re-cept & re-scribe \\
Re-mis & sub-duct & sub-sumpt & sub-scribe & sub-scribe \\
Sub-mis & \textit{(trans-cept)} & \textit{trans-scribe} & \\
\hline
\end{tabular}
\end{center}
\end{table}
8.1.2 Semitic roots

Insofar as Semitic roots have phonological properties that must be stated independently of Content, here too we have evidence for the phonological reality of roots. That Semitic roots cannot be sensibly assigned Content is a point already noted in Chapter 1. Thus consider again the picture in (4):

(4) $\pi_{KTB}$ $\pi_{XSB}$ $\pi_{PKD}$

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<tbody>
<tr>
<td>katab</td>
<td>xašab</td>
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<tr>
<td>hiktib</td>
<td>nexšab</td>
<td>nipqad</td>
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<tr>
<td>hitkatteb</td>
<td>xiššeb</td>
<td>pijqad</td>
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<tr>
<td></td>
<td>hexšib</td>
<td>hitpiqad</td>
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<td>miktab</td>
<td>maxšeb</td>
<td>mipqad</td>
</tr>
<tr>
<td>makteba</td>
<td>maxšaba</td>
<td>mipqada</td>
</tr>
</tbody>
</table>

'write' 'think' 'order'
'dictate' 'be.considered' 'be.absent'
'correspond' 'calculate' 'command'

The Content commonality here, as already noted in Chapter 1, might just be sufficiently robust to find it tempting to say that, e.g., $\pi_{KTB}$ has some conceptual Content to the effect that it is related to writing. Whatever Content one is tempted to objection on the availability of a purely phonological account for the miti/mis variation which does not require reference to a stem as such, Štekauer nonetheless acknowledges the need for units that are bigger than phonemes but still devoid of Content (and we note in this context that a pure phonological variation for script/scribe would not be as easy to derive). By way of wishing to preserve the term “morpheme” for the smallest sound-Content combination, Štekauer suggests the existence of “formemes”, units with phonological properties alone, and where e.g. scribe would be such a formeme. We note in this context that such formemes would still need to be abstract enough to allow for allomorphic variation in specified contexts, and with the contexts under consideration largely morphological in nature.

From the perspective of the present account, there is every reason to identify roots, in the sense of a phonological index, with formemes in Štekauer’s sense. What remains unclear, however, is what, if any, is the usefulness of an additional representation which we may term “morpheme”. Such a morpheme, we note, would sometimes be paired with a formeme (e.g. table) but at other times would not (e.g. ceive), requiring, to begin with, not only a list of formemes and a list of morphemes, but also a list of the matching of the two. Past that point, it would also require a third mechanism to deal with the emergence of non-compositionality, i.e. cases where some putative morpheme, say straw, fails to actually correspond to its own Content in some derived context (e.g. strawberry). In contrast, in XSM roots might be formemes, but what they map onto is not a morphemic representation, but rather a syntactic representation within which some domains are earmarked as available for (atomic) Content matching. As I will show in Chapter 9, the phonological properties of roots certainly play a role in Content matching, as does the syntactic structure within which they are embedded. However, none of this is contingent on the properties of roots qua roots. Rather, some Content domains may be coextensive with roots (e.g. /table/), but others may be considerably bigger and complex, and certainly not mono-morphemic or mono-formemic, for that matter (e.g. /editorialize/).

At the heart of the XSM model, then, lies the claim that there is no one-to-one relationship between form and Content. Insofar as the morpheme, as typically conceived, consists of the claim that these domains are co-extensive, the model presented here is, then, not “morphemic”.

Ironically, the very same objections are applicable to Aronoff’s (1994) “stem”, likewise an intermediate unit mediating between “formemes”, or our roots, and Content. For phonological evidence against stems, see Embick and Halle (2005).
ascribe to $\pi\sqrt{\times\tilde{\text{b}}}$, however, already requires considerable appeal to some rather vague notion of conceptual relatedness, as there appears to be little that is common between CALCULATE and ESTEEM such that we might find it beneficial to derive them from the same basic Content. Finally, the only way to reconcile $\pi\sqrt{p\tilde{q}\tilde{d}}$ with any systematic Content would be to assume that the root is, at the very least, a three-way homonymy. Once this is done, however, there is still no way of predicting what morphological shape would be associated with which variant of that homonymy. Thus masculine mipqad ‘census’ would need to be derived from the ‘counting’ Content of $\pi\sqrt{p\tilde{q}\tilde{d}}$, but the morphologically virtually identical feminine mipqada ‘army HQ’ would need to be derived from the ‘command’ Content of $\pi\sqrt{p\tilde{q}\tilde{d}}$. The correspondence between sound and Content of these complex forms, then, would have to be stated independently and little could be gained from associating either form with some presumed Contented root source.

The root $\pi\sqrt{p\tilde{q}\tilde{d}}$, however, is clearly a single phonological entity. It consists of the very same segments, or phonemes, in all its occurrences, and obeys, in all its instances, the Obligatory Contour Principle of McCarthy (1986), as do, indeed, all roots. As already noted by McCarthy, the OCP cannot be reduced to either phonological or phonotactic constraints, and must be stated on roots, including roots that have radicals that may otherwise remain unrealized. It specifically does not constrain consonantal adjacency across morpheme boundaries (cf. (5a), prefixes underlined, root radicals capitalized), nor does it constrain consonantal adjacency in underived nouns or adverbs, where there is little reason to assume a consonantal root (cf. 5b):10

9 mipqad ‘census’ and mipqada ‘army HQ’ belong to the same nominal morphological pattern, mišqal, and are only distinct in the latter having a feminine ending. The feminine ending in this particular mišqal, at times correlates with locations. We note, however, that this is no more than a tendency. Furthermore, this is by no means the general role of feminine endings, nor is a feminine ending required for a location Content to emerge. misrad ‘office’, with the identical mišqal, is masculine, and *misrada, the feminine variant, is not attested. Mišpaxa ‘family’ as well as miqdama ‘pay advance’, among others, and in the same mišqal, clearly do not have a location reading. On the derivational function of feminine endings in Hebrew, see especially Bat El (1986) and Ritter (1993).

10 It is worthwhile noting that the OCP is an extremely robust effect. With the exception of ND/NT clusters, which occur but where a case could be made for the affixal nature of the n-, there are, to the best of my ability to ascertain, exactly four Hebrew roots (otherwise occurring within the verbal paradigm) that violate it, as given in (i). Within the domain of underived nouns, however, “counter-examples” are in the dozens (note that the gemination is part of the morphological derivative, not part of the root):

(i) mippa ‘mapped’ (root $\pi\sqrt{\tilde{\text{m}}\tilde{\text{m}}\text{p}}$); mimmeš ‘realized’ ($\pi\sqrt{\text{m}\tilde{\text{m}}\text{s}}$); ťittě ‘swept’ ($\pi\sqrt{\text{t}\text{t}}$); didda ‘hobbled’ ($\pi\sqrt{\text{d}\text{d}}$);

As noted by McCarthy (1986) bi-radical roots do not appear to obey the OCP, but on the other hand, in all such bi-radical roots, not only diachronic but also synchronic evidence suggests the presence of a glide occurring between the two identical radicals (cf. (ii)). Insofar as the OCP in such cases absolutely cannot be reduced to surface form, where no such glide is in evidence, it provides even stronger evidence for a root-specific phonological constraint:

(ii) zaz ‘move’ ($\pi\sqrt{\text{z}(w)\text{z}}$); nam ‘nap’ ($\pi\sqrt{\text{n}(w)\text{n}}$); cac ‘pop up’ ($\pi\sqrt{\text{c}(w)\text{c}}$); sas ‘be glad’ ($\pi\sqrt{\text{s}(w)\text{s}}$); dan ‘judge, discuss’ ($\pi\sqrt{\text{n}(w)\text{n}}$); nad ‘swing, rock’ ($\pi\sqrt{\text{n}(w)\text{d}}$)
That the tri-radical root \( \pi_{pqd} \) has phonological properties that are constant across all its occurrences is thus an inevitable conclusion. To claim that \( \pi_{pqd} \) is precisely that, a tri-radical phonological representation with well-defined properties and constrained by the OCP, and that it is present in the grammar exactly once, is by Occam’s Razor the simplest hypothesis. The only possible motivation for assuming anything else would be the ability to derive predictably from the root, however represented, the morphologically complex forms it is implicated in, together with their Content. Given the impossibility of any such system, there is every reason to assume that what merges, as part of the syntactic representation, is indeed the index \( \pi_{pqd} \). In turn, Content would now be handled as it must be handled under any account—relative to constituents that contain not only \( \pi_{pqd} \) but also some additional information, and which constitute larger constituents.\(^{11}\)

We note that what emerges directly from the discussion above is that homonyms, such that they do clearly exist, do not constitute a distinction that can be stated at the level of the root. To illustrate, from our perspective, there is a single root \( \pi_{bank} \), consisting of a phonological representation which is uniform across its occurrences. Importantly, the root consists of no more than that. To the extent that /\( p \)bank/ at some later point may be matched with two very distinct atomic Content units, one roughly synonymous with SHORE and the other roughly synonymous with FINANCIAL INSTITUTION is, from the perspective of the root and its derivational history, simply irrelevant. This said, care must nonetheless be taken to ensure that the phonological information under consideration is, indeed, identical. To illustrate, consider the fact that for many contemporary speakers of English, the plural of the computer pointing device /\( p \)mouse/ is /\( p \)mouses/ rather than /\( p \)mice/. Under the assumption which seems largely valid, at least for English, that only one realization of plural is available for each root,\(^{12}\) for such speakers, there are, perforce, two distinct roots here, one of them in reference to some index \( \pi_{mouse}^1 \) of an entry with a specified realization for \( [\pi_{mouse}]^{\text{div}}_a \) as /\( p \)mice/, and the other in reference to an entry \( \pi_{mouse}^2 \), where no such specification is available, and where, as a result, the plural form is realized as the default /\( p \)mouses/ (and see fn. 27 below for an

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\(^{11}\) As noted briefly in Chapter I, Arad (2005) in addressing this very dilemma, opts to claim that roots do have basic meaning, setting in turn a battery of truth-condition tests to determine when, exactly, occurrences of 2–4-consonant combinations represent the same root, and when they are cases of homonymy. The end result involves radical fragmentation (e.g. postulating at the very least three distinct homonyms for \( \pi_{pqd} \)), and is, grammatically, of dubious use, insofar as even when divided into three distinct roots, and as noted in the text discussion, it would still be impossible to predict which derivatives would correlate with each of them.

\(^{12}\) See, however, Acquaviva (2008) on the existence of both oxes and oxen, the former with a specialized meaning, but nonetheless at least plausibly related to the same root \( \pi_{ox} \).
illustration of the same point from the Hebrew verbal paradigm). Insofar as there are no points at which we are required to appeal to distinct information when it comes to bank, there is little reason to differentiate these roots.13

8.1.3 Merging the phonological indices of functors

Although looking to argue for a rather distinct perspective (and see section 8.2 for a review), an argument for roots as phonological indices nonetheless emerges from the discussion in De Belder and von Craenenbroek (2011). In arguing against attributing any Content to roots, including inert Content (and thus explicitly contra Borer 2005a, b) they note that functional vocabulary may merge as roots, as should be evident from cases such as (6):

(6) a. This the is accomplishing a very different task from that the.
   b. The very in his letters is always in the wrong position.
   c. You should delete every other insofar in this text if you want to sound less pompous.

To the extent that any Content can be associated with such phonological representations, it is in reference to a concept, however otherwise narrow, of a specific articulation that might correspond to some linguistic use. The terms, however, although otherwise associated with functions, are not associated with functions here. Insofar as very, for instance, is otherwise an S-functor that assigns range to an open value which subsequently becomes an ExP-segment of some {Ex[A]}, this is clearly not what it is accomplishing in (6b). If, as suggested here, all phonological indices may be part of the numeration array, and especially if we assume that such phonological representations, or indices, may exist as a listed reservoir away from their Content, or for that matter, function, their ability to merge as roots in (6) follows directly.

We note now that not only phonological representations which correspond to otherwise Contentless functional vocabulary, but also clear nonce phonological

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13 A brief note might be warranted on what might appear like a natural question, namely, how would one know which root to choose, or, differently put, how do we know to associate mice with the rodent, but mouses with a computer peripheral, if √mouse in itself never has Content?

The question vanishes, however, once we realize that the gradual unfolding of the derivation, as it is depicted here, is an abstraction, and is not intended as a model of performance. Rather, it is intended to describe relationships of formal dependencies between grammatical components. There is, then, no sense in which mice or mouses is pronounced before the speaker knows what it is that they intend to say exactly. At some point, Content is matched with the relevant forms, roughly as follow:

(i) a. /mice/ ⇔ RODENT(s)
   b. /mouses/ ⇔ COMPUTER POINTING DEVICE(s)
   c. /mouse/ ⇔ RODENT; COMPUTER POINTING DEVICE [disambiguated by discourse]

From the perspective of a hearer, we note now, there is every reason to assume that /mouse/ remains ambiguous and requires context to be disambiguated, but not so mice or mouses. To the extent that we now postulate √mouse and √mouse, but only one √bank, then, it amounts to claiming that while some phonological cues do differentiate the matching of Content for (some instances involving) √mouse and √mouse, for others, as well as for the matching of appropriate Content to √bank, neither phonological nor syntactic cues suffice and context remains the sole cue.
representations can merge as roots, giving rise, in one of the best-known cases, to Lewis Carroll’s *Jabberwocky* (all presumed roots underlined):

(7) ‘Twas brillig, and the slithy toves
    Did gyre and gimble in the wabe:
    All mimsy were the borogoves,
    And the mome raths outgrabe.

The conclusion that must be reached on the basis of both (6) and (7) is that neither syntactic structure nor syntactic category could possibly emerge from the lexical specifications of the root, and both must be otherwise computed, a point already noted in a similar context in Borer (2005a, b). Even more crucially, and by no means trivially, Content, as such, cannot possibly be a central property of roots, nor, in fact, is Content in any way crucial for the emergence of either syntactic or morphological well-formedness.14

8.1.4 Phonological root selection

The final argument has already been articulated in some detail in Chapter 6, albeit with a slightly different focus. Recall that the argument for the syntactic existence of C-functors as well as for their properties as projecting a category and defining a Categorial Complement Space was based, among other factors, on the existence of a cluster of potential spellouts for the same C-functor. Specifically, I argued that the spellout of \(C_{\text{N}[V]}\) in English, when otherwise devoid of any semantic function (thereby excluding, e.g., ING), may be any of the representations in (8a). In a similar vein, I suggested that \(C_{\text{A}[N]}\) has the alternative spellouts in (8b), and \(C_{\text{V}[N/A]}\) the spellouts in (8c):

(8) a. /\_\_ation (ion, tion, sion)\_/; /\_\_ence\_/; /\_\_ance\_/; /\_\_ement\_/; /\_\_al\_/  
     b. /\_\_all\_/; /\_\_ous\_/; /\_\_ic\_/  
     c. /\_\_ize\_/; /\_\_ify\_/; /\_\_ate\_/  

Importantly, I noted that for each of these groupings, only one form, the one underlined in (8a–c), systematically attaches to otherwise suffixed, complex forms, making it the default, unselected spellout for each of these functors. The other spellouts, on the other hand, are directly selected by the root in local contexts.

Insofar as the specific spellout associated with C-functors merging with some roots is explicitly specified in conjunction with these roots, this provides not only evidence for the existence of roots, but also direct evidence for the existence of roots specifically as packets of phonological information.

Interestingly, and non-trivially, whatever phonological index is associated with e.g., \(\pi^\sqrt{\text{more}}\) or \(\pi^\sqrt{\text{slith}}\) as in (9) and similar cases (the former, importantly, not a functor

14 While Humpty Dumpty does go ahead to assign arbitrary Content to all nonce forms in (7), the purpose of the exercise is clearly to highlight the fact that Content is a listed convention. Specifically, what is of significance here is that the “vocabulary” in (7) is formally well formed although it is not encyclopedically listed, and its well-formedness is thus clearly divorced from its listedness or lack thereof.

15 And note also /\_\_ancy, encyl/, although -ency/ancy may represent additional suffixation and none of these predictably participates in the AS-/R-nominal alternation, raising the possibility that they are more narrowly constrained, e.g. by the presence of a nominal functor spelling out as /\_\_yl/'. For some brief comments on /\_\_age/ and /\_\_ure/, see Chapter 7, fn. 28.
but a mere phonological index) appears to allow just about any imaginable phonological realization for merging C-functors, and at least in principle, any allomorphy within reasonable phonological recognition range, and hence:

\[(9)\]

\begin{align*}
\text{a. } & \text{this } \text{more/slith} \text{ is much nicer than that } \text{more/slith}; \text{ the } \text{more/slith} \text{ is acting up again} \\
\text{b. } & \text{he } \text{mored} \text{ and } \text{slithed/mired} \text{ and } \text{slath} \\
\text{c. } & \text{some } \text{moration/morance/moring/morement} \text{ you have here!}; \text{ morive; morous; moric; morize; morify} \ldots \\
\text{d. } & \text{some } \text{slithence/slithment/slithal/slithation}; \text{ slithatious; slithify; slithable; slithy} \ldots
\end{align*}

If the range of variations available in (9) is at all telling, in turn, it suggests that to the extent that (established, listed) roots do exercise phonological selection, their phonological properties are in the way of excluding, rather than positively specifying, possible realizations.

8.2 Faithfulness and Roots

8.2.1 Morphology is morpho-phonology!

While the previous section provided evidence for roots as indices referring to packets of phonological information which are otherwise devoid of Content, we note that at least thus far, little has been said to justify the assumption that roots specifically merge as phonological indices, and are not subject to some form of late insertion. In turn, and as we shall see, this may very well be a red herring. At the core of the discussion, I submit, are not questions of early or late, but rather questions of faithfulness, where faithfulness is both structural and phonological. It is to these diverse notions of faithfulness that I now turn, to solidify the concept of roots as phonological, Content-less indices proposed in this work.

Our starting point concerns a matter already touched upon in Chapter 1, which is nonetheless sufficiently significant to warrant elaboration. Consider, yet again, what was referred to, in Chapters 1 and 2, as the Remarks Challenge. In excluding a syntactic derivation for de-verbal nominals, Chomsky (1970) appeals, first and foremost, to some notion of rule-governed regularity, which, he argues, is not sufficiently robust in derived nominals. Thus it is possible to compute the properties of gerunds from putting together the properties of the stem, the properties of the affix, and the properties of whatever operation is responsible for combining them, say (risking anachronism) Merge. That, however, is not the case for derived nominals, as Chomsky amply exemplifies. It is warranted, however, to pause briefly to make explicit a presupposition which underlies Chomsky’s comparison to begin with. Given that the properties of, e.g., proofs are not systematically predictable from the properties of prove, or given the fact that the properties of recital are not systematically predictable from the properties of recite, why are we at all concerned with the question? The properties of, e.g., circle and round are not predictable from each other, and neither are the properties of chair predictable from sit. A model seeking
to relate, grammatically, *chair* and *sit*, or, indeed, treatises devoted to arguing specifically against such grammatical relatedness are not a very common linguistic enterprise, nor would it occur to any sensible present-day generative linguist to embark upon constructing them. The reason is self-evident. The hypothesis that *recite* and *recital* or *prove* and *proofs* are related, as well as any discussion of the way in which they are—or possibly are not—related, is deemed an appropriate subject matter for linguistic inquiry, because the forms are phonologically related. That a grammatical relationship between *sit* and *chair* is neither pursued nor denied follows from the fact that they are not phonologically related, although they are clearly conceptually related, and presumably every bit as much so if not more than *recite* and *recital* or *prove* and *proofs*. The presupposition here, then, is that phonological relatedness is a necessary, although possibly not sufficient condition for establishing grammatical relatedness. From any other perspective, the question posed by Chomsky (1970), and by most morphological studies, as well as the comparison between derived nominals and gerunds, simply makes no sense. On the other hand, at least one way of looking at the Remarks Challenge, and a way which Chomsky himself comes fairly close to, would be to say that it amounts to the claim that phonological relatedness might be necessary for grammatical relatedness to hold, but insofar as it is not sufficient, the grammatical relationship between *recite* and *recital* is the same as that which holds between *chair* and *sit*, i.e. non-existent. From such a perspective, if adopted, the relationship between *recite* and *recital* would not be an appropriate subject matter for grammatical investigation, and the phonological similarity could be either a mere epiphenomenon or a factor to be handled by a component which is of a very different formal nature, e.g. an intelligent list.\footnote{We note in this context that “historical coincidence”, a term sometimes used to account for phonological correlations which are devoid of grammatical significance (see e.g. Newmeyer 2009), is puzzling at best. The only way to reconcile the existence of a historical, but not synchronic, relationship between *destroy* and *destruction* or *recite* and *recital*, would be to assume that once upon a time, the relationship between *destroy* and *destruction* or *recite* and *recital* had the same grammatical status as that which determines the relationship between *recite* and *rectifying* (in its gerundive instantiation). The claim is, to begin with, questionable on historical grounds, but also leads to another puzzle. Why should the historical, presumably regular rule that gave rise to *destruction* and *rectifying* leave behind listed and potentially drifted residues, but not so the historical rule that has been giving rise to gerunds, or to past tense marking, or to participles?}

Chomsky, however, does shy away from allowing phonological relatedness to be altogether grammatically irrelevant, precisely because it would render whatever regularity holds in the complementation environment of, e.g., *destroy* and *destruction*
a coincidence. If phonological relatedness is epiphenomenal, then there is little reason to expect any syntactic or interpretational correlations between phonologically similar forms. Indeed, and taking again the Remarks model as our starting point, there would be little reason to expect any phonological similarities between the spelling out of an uncategorized item in nominal or verbal domains. Given a listed item such as RECITE, where by RECITE we refer to Content, it would be perfectly conceivable for this item to emerge as /p̩recite/ or for that matter /p̩repeat; narrate; recount/ in a verbal context, but as /p̩presentation; reading; narration; solo concert/ or indeed /p̩recital/ in a nominal context. Importantly, note that the issue is at least to some extent empirical—it may very well turn out to be the case that uncategorized items, call them roots, spell out very differently depending on their grammatical context, and that the existence of phonological relatedness in groupings such as destroy, destruction, destructive, destructible is a coincidence which largely underdetermines the vast possible spellout possibilities, and as such has usurped much attention elsewhere needed. Within technical vocabulary devoted to such issues, this would put forth a model where “suppletion” provides the core of the phenomena, and where morpho-phonological relatedness, to the extent attested, is to be described in non-grammatical terms. As it turns out, however, it is precisely groupings such as destroy, destruction, destructive, destructible that constitute the subject matter of morphology. If they are but phonological epiphenomena, then the field of morphology as we typically understand it does not and could not exist, as its inquiries concern epiphenomena which are not likely to surrender any interesting grammatical regularities or any valuable insights into the language faculty.

The bottom line, then, is that the field of morphology, the study of the properties of complex words is only valid or sensible if it takes as its fundamental subject of inquiry what has come to be known as “morpho-phonology”. Insofar as at the heart of any structural approach to language there lies an assumption about formal relatedness—between sounds and structure, between structures and interpretation, and between various structures—the study of complex “words” is and remains fundamentally the study of morpho-phonological relatedness. In the absence of morpho-phonological relatedness, however perceived, the body of relevant observations simply does not exist and the term “morphology” could no longer be usefully applied. It therefore follows that any attempt to model morphology within a hierarchical, structural approach, be it syntactic or non-syntactic, has as its basic subject matter the

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18 And see section 1.1 of Chapter 9 on the difficulties of accommodating, within the Remarks system, the compositionally predictable relatedness of transform and transformation, or recite and recital.

The conundrum concerning the exact role of phonological relatedness in the Remarks system is probably at its most evident in the system of Lexical Redundancy Rules developed by Jackendoff (1975). Caught between the theoretical desideratum of abandoning morphology as a generative enterprise, and the clear undesirability of relegating morpho-phonological correlations to the realm of coincidence, what emerges is a system which appeals, effectively, not to grammar as such, but to memory facilitation. Specifically, storing destroy facilitates the storage and presumed retrieval of destruction, storing recite facilitates the storage and presumed retrieval of recital, and so on. We note that although the system is certainly not generative, it appeals to the idea that there is at least a semi-stable relationship between phonological representation and denotation, thereby making phonological relatedness a pivotal one in examining linguistic relatedness in general.
question of whether some morpho-phonological observations can be explained while appealing to otherwise motivated grammatical hierarchical properties. The matter actually deserves being put rather more bluntly. Any “morpho-syntactic” hierarchical account of “words” accompanied by the assumption that such structures are then mapped onto some yet-to-be-developed “morpho-phonological” representation with properties that bear no derivational trace of the source syntax is a vacuous exercise, insofar as whatever explanation it may offer does not bear on the phenomena that it has set out to explain. Whatever knowledge we do have that comes under “morphology” is, by and large, morpho-phonological and grounded deeply in some notion of phonological relatedness and phonological segmentability. It may indeed be the case that there are no correlations between morpho-phonological representations and syntactic structure. It may very well be that there are no morpho-phonological structures as such altogether. Should that be the case, however, the study of “morpho-syntax” as a component with no morpho-phonological properties is even more futile.

The point would have been trivial, had it not been the case that it is so systematically overlooked, and had it not been the case that “morpho-syntax”, as frequently practiced, consists of postulating abstract syntactic representations which are fully in accord with syntactic operations and principles, but which shed no light whatsoever on the eventual phonological properties of the emerging forms, thereby evading any genuine discussion of the body of observations which typically comes under “morphology”, and in consequence offering no explanation for the very phenomena that justify the inquiry to begin with.

Suppose we consider some concrete examples, taking as our starting point the well-known historical claim according to which /p kill/ spells out a complex syntactic structure, roughly along the schematic lines in (10) (presumably with CAUSE a functor and DIE corresponding to Content in some structure):

\[
(10) \quad [\text{CAUSE } [\text{DIE}]] \quad (\text{tense}) \ [\text{DIE}]
\]

Within present-day approaches, the best way to formulate the relationship between the complex syntactic structure in (10) and its spellout would require late insertion, insofar as it would allow DIE to merge without any inherent phonology, and could await the end of the derivation to be spelled out. Late insertion in and of itself, however, might be necessary for this execution, but it is not sufficient. More crucially, and under the assumption that /p kill/ is mono-morphemic in some morpho-phonologically coherent sense, late insertion would have to be supplemented by the assumption that discrete syntactic units, such as [DIE], need not correspond to discrete morpho-phonological units, and that although [CAUSE [DIE]] is both syntactically and semantically complex and compositional, such complexity and compositionality need not translate into morpho-phonological complexity and compositionality. What is, then, at the very least, a branching syntactic structure and a function-argument configuration in syntax and semantics may spell out as a single
morpho-phonological unit, or morpheme. The final claim, we note, is crucial insofar as a one-to-one correspondence between syntactic terminals and morphemes (the latter taken specifically to refer now to phonological units) is not excluded by late spellout, and rather, can be enforced by the latter if spellout is by cycles or by phases, resulting in the obligatory spelling out of [DIE] before proceeding to spell out CAUSE.

Alongside (10) one could also consider the variant in (11), likewise requiring late insertion. According to this variant, [DIE] is spelled out discretely, thereby retaining some correlation between morpheme and syntactic terminal, but its specific spellout is contingent on its environment. Specifically, in the context of [CAUSE], [DIE] is pronounced /kill/, but not so on its own or in contexts such as [DIE]-ing. [CAUSE], under such an execution, would correspond to a zero morpheme:

(11) \[ [DIE] \rightarrow /s\text{kill}/ \text{CAUSE } \] 
\[ [DIE] \rightarrow /s\text{die}/ \text{elsewhere} \]

Both executions, we note, are not morpho-phonologically faithful, and in rather similar ways. Both subscribe to the view that the constituent [DIE], syntactically and in terms of its presumed Content otherwise identical, may correspond to two very distinct phonological representations as dependent on its syntactic context. (10), but not (11), is further committed to the assumption that there is no coherent mapping between syntactic complexity and morphological complexity. The proposals also share something else which is rather fundamental, and which emerges directly from late insertion, and that is a commitment to the existence of some grammatically useful item, call it [DIE], which can merge syntactically, but which does not need to have consistent phonology across its occurrences. We note that while CAUSE could

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19 It goes without saying that the points made here crucially address hierarchical structural accounts for complex words, be they syntactic or morphology-specific. If, as in Beard (1995), morphemes are not constituents but rather names of operations, complexity as such becomes orthogonal and structural hierarchy non-existent. It therefore follows that Beard’s “words”, as such, cannot be syntactically decomposed, but as that has never been his aim, this is hardly a drawback.

It is worthwhile noting that insofar as in the present work I did adopt the claim that S-functors may be a morphemic in the Andersonian (1992) sense (but morphemic in the Beardian 1995 sense), syntactic structural complexity which is associated with “inflection”, so called, does not translate directly to morphological (or morpho-phonological) complexity. Recall, specifically, that in a structure such as (i), /put; walked; left/ would all be mono-morphemic (see Chapter 1 and Chapter 6 for a detailed discussion). Importantly, however, past tense marking does emerge in the context of two terminals, that which hosts the abstract PST S-marker, and that which comes to host the root/verb and be marked as PST. Crucially, for the perspective presented here, what spells out as a mono-morphemic constituent, and in contrast with the spellout of e.g. /kill/ in (10), is a single terminal, not the combination of two terminals:

\[ \text{(i) } [\text{PST} \ll [\text{\texttt{\textbackslash leave}\texttt{\textbackslash pie}}}]] \quad \ldots \ldots \text{[\texttt{\textbackslash leave}}} \]

---

20 Likewise, a single syntactic terminal may spell out as a multi-morphemic structure. The latter, however, is considerably less controversial, and, present work notwithstanding, is the standard assumption concerning, e.g., compounds or complex derivatives.

21 In fact, under the plausible assumption that events are phases, the spellout in (10) is inherently incompatible with Phase Theory.
be construed as a rigidly designating item, a functor, that is not the case for [DIE]. If the items which are not functors, but which merge syntactically, are to be given some characterization in systems that utilize (10) and (11) or some equivalent versions, and if we assume that [DIE] corresponds to an atomic enumerated item, then such systems are perforce committed to attributing some essential non-phonological properties to roots.

It is worthwhile noting that the explanatory value of the syntactic structure in (10) does not rise and fall on its ability to account for spellout properties. The structure, historically, was not put forth to account for properties of morpho-phonological constituents, and criticism of that structure, historically, focused on its syntactic and semantic properties, as well as on issues concerning the syntax-semantics interface. From the perspective of our discussion here, what is crucial is that a model which allows for the structure–spellout pairs in (10) cannot possibly be put forth as a syntactic account for the properties of morphological units. Should there turn out to be overriding reasons to adopt the structure in (10) specifically as a pair of syntactic structure and a spellout configuration (and not, say, as a semantic decomposition), the inevitable consequence would be that the attempt to account for morphological properties through syntactic structures is not likely to be a successful one.22

But if structure–spellout pairs such as those in (10) do exist, and if, as a consequence, there could be no sensible mapping between syntactic structures and morphological ones, then one must wonder whether roots, are in any sense a useful notion. Indeed, this is the question raised by Ramchand (2008). Rather than postulate roots which have neither phonologically discrete properties nor semantic ones, Ramchand proposes that phonological representations associated with, e.g., kill or die are a direct spellout of a particular functional structure, absent anything that might otherwise be referred to as lexical head. More concretely, within that system a “verb” spells out a set of ExP-segments that license events and sub-events, which in turn license various arguments. Irrelevant details aside, we may assume that /ₚdie/ spells out the structure in (12a) while /ₚkill/ spells out the structure in (12b):

22 Within the model advanced here and in Borer (2005b), neither kill nor break (assumed to be monomorphemic) has arguments, quite simply because terminals never do, and all argument configurations emerge from the functional array. While the specific execution (see Chapter 2) rejects both syntactic and semantic decomposition for “lexical” causatives, the architecture of the system, in and of itself, is certainly compatible with syntactic decomposition, if, indeed, it turns out to be semantically and syntactically well founded (and see, in this context, Doron’s 2003 arguments against such decomposition). Specifically, within the architecture here, the functional array that dominates intransitive break would merge with some ExP-segment valued as CAUSE or similar. In the case of break, the latter would need to be abstract, and would thus require the movement of the V-equivalent C-core and would give rise to its CAUSE S-marking (see Chapter 1, section 5.3 as well as Chapter 6, section 3 for discussion). We note now that regardless of the semantic and syntactic reasons to reject such a derivation, the phonological realization of e.g. break under such a scenario, and specifically, /ₚ√breakcause/, would need to remain faithful to whatever array of realizations is available in conjunction with /ₚ√break, and as such would need to remain faithful to the phonological realization of the root within the intransitive structure embedded under CAUSE. /ₚkill/ then, could never emerge as a licit realization of /ₚ√die within this model even if the existence of some S-functor CAUSE is deemed necessary.
The system is clearly underspecified insofar as (12a) could spell out not only as /ₚdie/ but also as /ₚbreak; fall; collapse/ or, for that matter, the intransitive use of /ₚcaramelize; liquefy; verbalize/, and in a similar fashion, (12b) could spell out as /ₚbreak; destroy; annihilate; electrify; crystallize/, etc. To be complete, the system thus needs to be augmented by a morpho-phonological component, capable of deciding between such realizations and matching them with Content somehow. We also note as a matter of straightforward consequence that insofar as the syntactic structure that would be assigned to /ₚcaramelize/ and to /ₚdie/ would be identical, the system is fundamentally committed to the claim that morphological complexity, if such exists, cannot possibly be derived from syntactic complexity. Insofar as the system would require augmentation by an independent morpho-phonological system—e.g., a system that will tell us how caramelize is pronounced, that it is morpho-phonologically complex, and eventually, what its Content is such that it distinguishes it from solidify or die—it is not an improvement in principle over some hypothetical root-based system which would allow for the executions in (10) or (11). Nonetheless, and because the system avoids postulating roots which otherwise fulfill neither a phonological nor a semantic role, it represents a syntactic simplification and hence an improvement over such executions. It thus emerges that in the absence of coherent, deterministic mapping of hierarchical syntactic representations to morpho-phonological ones, the need for “roots” is neither self-evident nor explanatory, as the presence of such roots would be inevitably duplicating a function for which an independent system is already in existence, the “morpho-phonological” system. We note, with some degree of irony, that in this sense Ramchand’s (2008) system is profoundly lexicalist. If, as in Di Sciullo and Williams (1986), “words” are the name for units constructed outside of the syntax with full Content and morpho-phonology, and which are only allowed to interact with the syntax through a bundle of hierarchically unordered properties, such “words” would be the perfect candidates to correlate, indeed to check, the configurations put forth by Ramchand (2008). If, as Ramchand would have it, any complexity and Content associated with e.g. verbalize cannot feed off the syntax but must be elsewhere determined, one would be rather hard pressed to distinguish that “elsewhere” system from a bona fide 1980s style lexicon.

Consider, finally, a recent intriguing execution proposed by De Belder and Craenenbroek (2011) and already noted briefly in section 8.1.3. Roots, as such, do not exist in their system. They proceed to assume, however, that first merge does not pick two, but rather only one element from the numeration. As Merge requires that element to merge with something, the result is merger with an empty set. The empty set, by assumption a member of a branching pair but otherwise devoid of properties, is then categorized by its syntactic context (following the execution in Borer 2003b, 2005a, b). Because the existence of such an empty set, in turn, is an artifact of first merge, it follows that all subsequent merges must be with real enumerable elements—by assumption functors of some sort. As a result, the only possible empty set is the
most deeply embedded one, effectively making it formally distinct from the rest of the terminals and the only one devoid of any formal properties. Finally, the system is augmented by the assumption that empty sets spell out freely at PF, presumably availing themselves of any otherwise well-formed phonological representation, including, e.g., that associated with functional strings such as the or will (see section 8.1.3).23

The system is attractive insofar as it derives the distinct formal nature of roots as well as their uniqueness within Extended Projections from formal properties of Merge. As matters stand now, however, the system is silent on what, if any, are the conditions on the spellout of empty sets, and whether, in the context of late insertion (or late Vocabulary Insertion, in the sense of Distributed Morphology), spellouts such as those in (10) or (11) are licit. Considering, specifically, the structure in (13a–b), we note that all the spellouts in (13c–d) are possible:

\[
\begin{align*}
&\text{(13) } \quad \text{a. } [\text{CAUSE } [=V\emptyset]] \\
&\qquad \begin{cases}
&\quad \text{/π}caramelize/
&\quad \text{/π}kill/
&\quad \text{/π}more/
\end{cases} \\
&\text{b. } (\text{PST}) \quad [=V\emptyset]] \\
&\quad \begin{cases}
&\quad \text{/π}caramelize/
&\quad \text{/π}die/
&\quad \text{/π}more/
\end{cases} \\
&\text{c. } [\text{CAUSE } [\text{C}=V\text{C}] ]
\text{ and the structure in (13a–b), we note that all the spellouts in (13c–d) are possible:}

More specifically and without added provisions, there is little to guarantee the discrete spellout of empty sets, thus allowing, at least in principle, the matching of [\text{CAUSE}[\text{C}=V\text{C}]] in its entirety with \text{/π}kill/, as in (10), or \text{/π}more/, for that matter, as well as the matching of any terminal with a morphologically complex element such as \text{/π}caramelize/. In turn, augmenting the system with some condition that would ensure some correlation between morpheme structure and empty sets would be difficult without introducing some notion of what could be a phonological unit such that it could correspond to the empty set, but, could not be, e.g., \text{/π}caramelize/. Some notion of morphological complexity, then, would need to be invoked to differentiate caramelize from kill or from more which would thus be potentially duplicating whatever complexity may already be built into the syntactic structure. Suppose, however, some such notion is introduced allowing a “local” spellout of empty sets in some well-defined way by some units of a prescribed size. The morphological relatedness of “roots”, however, would still go uncaptured. That \text{form}, \text{formation}, and \text{formal}, or \text{prescribe}, \text{prescription}, and \text{prescriptive} are related could not be stated without reference to the fact that the empty set, in all these cases, spells out in a phonologically identical way, or, in our terminology, refers to the same phonological index. In other words, it is hard to see how the system can be effectively faithful without making reference,

23 The execution runs into a bit of a snag when two roots need to merge with each other as in the case of compounds, or, for De Belder (2011), whenever any root merges with a C-functor, the latter, in her system, always roots. For some relevant comments, see Chapter 6, section 4 as well as Chapter 7, section 5.
one way or another, to an identical index referred to by all of these forms, and where the index under consideration is specifically in reference to shared phonological properties.

Empty sets could, of course, be provided with an index, and all occurrences of a single index could, at least in principle, be in reference to a fixed, delimited set of phonological properties.24 The result would block an empty set from spelling out as a complex form, it would force [CAUSE[\_\_]\_\_0\_] to be morpho-phonologically complex, and it would preserve the relatedness of \textit{form}\_\_V, \textit{formation}\_\_N\_, and \textit{formed}\_\_V and would be capable of availing itself of the identically specified phonological information determining the spellout of \textit{prescriptive} and \textit{prescription} vs. \textit{prescribe}. Once empty sets are provided with indices which eventually make reference to some constant phonological information across all their occurrences, however, the notion of roots that emerges is effectively identical to the one advocated here.25

8.2.2 A note on suppletion

Analyses which assume the spellout executions associated with (10) and (11) or some variant thereof appear to receive support from the domain of suppletion—cases where a stem, or a root, spells out radically differently in distinct structural contexts.26 Under consideration, then, are cases such as those in (14) (and see Chapter 7, section 6 for some comments on the adjective suppletion in (14b, c):

\begin{align}
(14) & \quad a. /\textit{go}/ vs. /\textit{went}/ \\
& \quad b. /\textit{good}/ vs. /\textit{bett}(er); \textit{be}(st)/ \\
& \quad c. /\textit{bad}/ vs. /\textit{worse}; \textit{wor}(t)/
\end{align}

(10) and (11), recall, differed from one another in how they correlated morphosyntactic complexity and morpho-phonological complexity. In (10), we had a morpho-phonological mono-morph, \textit{kill}, corresponding to a branching morpho-

24 Under an entirely free spellout, one could suggest that \textit{formal} and \textit{formation} or \textit{prescription} and \textit{prescriptive} are related by virtue of the fact that their roots happen to have been identically spelled out. Note, however, that insofar as there are common properties to roots across their instantiations (e.g. the realization as \textit{script} or \textit{scribe}), what would be required is not an identical spellout which may not be met under allomorphy, but reference to an identical phonological information packet. But once that is the case, the system becomes indistinguishable from that which involves the merger of a phonological index to begin with.

25 It is worth stressing that the view of roots as phonological indices is independent of early or late insertion. Certainly, an early merger of a phonological index ensures faithfulness, but such faithfulness can be likewise achieved if an identical phonological reference is associated with all occurrences of the same (coindexed) root, as just noted, even if such association is late.

26 Although phonological faithfulness as such is not defined in, e.g., Halle and Marantz (1993), their discussion, as well as subsequent developments in Embick and Halle (2005) and Embick (2004, 2010, i.a.), make it clear that whatever notion of faithfulness is presupposed, it is such that, e.g., /\textit{caugh}(t)/ and /\textit{catch}/ may be allomorphs of the same root, as can /\textit{sang}/ and /\textit{sing}/, but that whatever relates, e.g., /\textit{go}/ and /\textit{went}/ cannot be stated in terms of allomorphy. While in this work I leave the matter of defining phonological faithfulness, in the relevant sense, to phonologists, I will follow the intuitive dividing line set up in Halle and Marantz (1993) in assuming that, e.g., /\textit{caugh}(t)/ and /\textit{catch}/ do represent distinct spellouts of the same phonological index, the same root, but that this is not the case for /\textit{go}/ and /\textit{went}/, and with the latter, but not the former, being cases of suppletion.
syntactic structure. That, however, was not the case in (11), where \( kill \) corresponded to a mono-morph both syntactically and phonologically, and where the realization \( /_p \) \( kill \) did not emerge as a representation for a complex structure, but rather for a terminal in a particular syntactic context, i.e. that of CAUSE. The latter, we note, is thus rather reminiscent of the approach propounded in Distributed Morphology, where spellouts such as \( /_p \) \( broke \) or \( /_p \) \( caugh(t) \) do not correspond to a complex syntactic structure, but rather to the specific realization of the root in the context of \( O \) or \( t \)-PST affix, as in (15). Thus while \( /_p \) \( broke \) in its entirety does correspond to a complex derived form, the overt phonological material is only associated with a specific terminal. It is in this last respect that the model put forward here differs. Although, similarly, \( /_p \) \( broke \) emerges in the context of PST, and although similarly it spells out a single terminal, the form as a whole remains mono-morphemic, with its root realized in the context of non-structural S-marking (cf. 16):

\[
\begin{align*}
\text{(15)} & \quad \text{PST} \rightarrow \emptyset / \sqrt{\text{BREAK}}; \quad \sqrt{\text{BREAK}} \rightarrow /_p \text{break}/[\_\text{PST}] \rightarrow \\
& \quad \text{PST} \rightarrow t / \sqrt{\text{CATCH}}; \quad \sqrt{\text{CATCH}} \rightarrow /_p \text{caught}/[\_\text{PST}]
\end{align*}
\]

\[
\begin{align*}
\text{(16)} & \quad \langle \text{PST}, \llbracket [C=V \pi \sqrt{\text{BREAK}}] \rrbracket \rangle \rightarrow \langle \text{PST}, \llbracket [C=V \pi \sqrt{\text{BREAK}}] \rrbracket \rangle; \quad \llbracket [C=V \pi \sqrt{\text{BREAK}}] \rrbracket \rightarrow /_p \text{break}/ \\
& \quad \langle \text{PST}, \llbracket [C=V \pi \sqrt{\text{CATCH}}] \rrbracket \rangle \rightarrow \langle \text{PST}, \llbracket [C=V \pi \sqrt{\text{CATCH}}] \rrbracket \rangle; \quad \llbracket [C=V \pi \sqrt{\text{CATCH}}] \rrbracket \rightarrow /_p \text{caught} /
\end{align*}
\]

At least within the model under development here, a very similar system would take care of comparatives and superlatives (and see Bobaljik 2007, 2011 for a DM execution; see fn. 55 of Chapter 9 for a few more comments on the structure in (17) from the perspective of bracketing paradoxes); see, finally, section 6 of Chapter 7 on the possibility that adjectives are never roots, thus rendering the case below \([C=\pi \sqrt{\text{KIND}}]\) rather than \([C=\pi \sqrt{\text{kind}}]\):

\[
\begin{align*}
\text{(17)} & \quad \text{a.} \quad \langle \text{COMP}^{\text{DEG}}, \llbracket [C=\pi \sqrt{\text{KIND}}]/[A \text{bulgy}] \rrbracket \rangle \rightarrow \langle \text{COMP}^{\text{DEG}}, \llbracket [C=\pi \sqrt{\text{KIND}}]/[A \text{bulgy}] \rrbracket \rangle; \quad \llbracket [C=\pi \sqrt{\text{KIND}}]/[A \text{bulgy}] \rrbracket \rightarrow /_\pi \text{kinder}; /_\pi \text{bulgier} \\
& \quad \text{b.} \quad \langle \text{SUP}^{\text{DEG}}, \llbracket [C=\pi \sqrt{\text{KIND}}]/[A \text{bulgy}] \rrbracket \rangle \rightarrow \langle \text{SUP}^{\text{DEG}}, \llbracket [C=\pi \sqrt{\text{KIND}}]/[A \text{bulgy}] \rrbracket \rangle; \quad \llbracket [C=\pi \sqrt{\text{KIND}}]/[A \text{bulgy}] \rrbracket \rightarrow /_\pi \text{kindest}; /_\pi \text{bulgiest}
\end{align*}
\]

From the point of view of the cases in (14), now, the question becomes what is to prevent the realizations in (18):

\[
\begin{align*}
\text{(18)} & \quad \text{a.} \quad [T \text{PST}^t] \llbracket [C=V \pi \sqrt{\text{GO}}] \rrbracket \rightarrow /_\pi \text{went}/ \\
& \quad \llbracket [C=V \pi \sqrt{\text{GO}}] \rrbracket \rightarrow /_\pi \text{go}/ \text{elsewhere} \\
& \quad [\text{DEG}] \llbracket [C=\pi \sqrt{\text{BAD}}] \rrbracket \rightarrow /_\pi \text{worse}/ \\
& \quad [\text{DEG}] \llbracket [C=\pi \sqrt{\text{BAD}}] \rrbracket \rightarrow /_\pi \text{worst}/ \\
& \quad [\text{DEG}] \llbracket [C=\pi \sqrt{\text{BAD}}] \rrbracket \rightarrow /_\pi \text{bad}/ \text{elsewhere}
\end{align*}
\]

The representations in (18), as they stand, are incoherent. Specifically, allowing a single root to spell out as \( /_p \) \( go \) in one context, but as \( /_p \) \( went \) in another, or as \( /_p \) \( bad \) in one context but as \( /_p \) \( worse(t) \) in another effectively renders vacuous the claim that roots are pure phonological indices. It is entirely clear that no theory of phonological faithfulness, however supplemented, and no phonological reference, however underspecified, could relate these two sets of realizations. If, e.g., \( /_p \) \( go \) and \( /_p \) \( went \) must be
characterized as spellouts of the same root, then the inevitable conclusion is that roots cannot be in any explanatory sense phonological indices. The same, of course, goes for the comparative/superlative paradigms. If the best description for the spellout possibilities in e.g. (18) involves a derivation from the same root, then roots cannot be, meaningfully, phonological indices for the simple reason that postulating them as such gives rise to no meaningful restrictions on the set of possible realizations one is to expect.

Historically, as is well known, pictures such as those in (14) emerge from the existence of two distinct roots used in roughly synonymous contexts, each with a full inflectional paradigm. Descriptively speaking, suppletion occurs when some members of paradigm A are replaced by members of paradigm B, and vice versa, to the point where for any paradigmatic cell, so to speak, there remains a single realization, as schematized, roughly, in (19):

(19) A. go(n) go(n)(ed) gone(n) A. go go(n)(ed) gone
    B. wend went wenden B. wend- wend- wenden-

Evidence for the emergence of such situations, and indeed, for their incremental and gradual nature, comes from the existence of a partial merger of paradigms. Such a situation is currently in existence relative to two Modern Hebrew verbs, both roughly correlating with 'say'. The verbs are constructed of distinct roots and utilize distinct morphological patterns (binyanim), but the paradigms are nonetheless in the process of merging, as illustrated in (20):

(20) π√ygd (binyan I-Qal) π√ygd (binyan V)
    past amar higid say.PST.3.M.SG
    present omer magid say.PRES.3.M.SG
    future (#)yomar yagid say.FUT.3.M.SG
    infinitive (#)l.omar le.hagid to say
    imperative (#)tomar tagid say!

(#{-stylistically elevated register

The past and present forms of the root π√ygd have now vanished. The paradigms have not, however, merged completely, insofar as the future, infinitive, and imperative forms π√ygr are still very much in existence. However, they have moved to a higher register. One could surmise that moving into such a higher register is a precursor to their eventual disappearance from the language.27 What is entirely clear, however, is

27 Plausibly, at least some pressure has come to be borne on the paradigms from the presence of an alternative Content for π√ygd in the same morphological pattern (binyan V) meaning 'inform' (children's register, primarily), and where the paradigm is virtually full (although rather marginal in present tense). Insofar as the set of phonological realizations for π√ygd in these contexts part ways, note, this could provide evidence for the existence of homonyms, a point already discussed in section 1.2 (and see also fn. 13) in the contexts of /mice/ vs. /mouses/:

(i) Dani higid/yagid/tamid ??magid ?alay/’oti la-more
    Dani informed/inform.FUT/always informs on-me/me to-the.teacher

'Dani informed/will inform/always ??informs on me to the teacher.'

( cont.)
that at least at present, it is not possible to postulate a single root which underlies the entire paradigm, but which displays suppletive phonological alternatives in distinct contexts. Rather, both roots, and as phonological indices, must be assumed still to be in existence. By way of accounting for the partial merger of the paradigm, then, we must inevitably assume that some realizations, as linked to particular morphological patterns (binyanim) and in particular syntactic contexts (tense), have disappeared. Specifically, the phonological entry referenced by $\pi\sqrt{ygd}$ no longer contains realizations for past and present, while the phonological entry referenced by $\pi\sqrt{mr}$ has its future and infinitive realizations marked, stylistically.

Synchronically, then, it is clearly possible for two phonologically unrelated verbal paradigms with a similar Content to exist side by side, each with some missing members, thereby leading to the presence of only one option for expressing, e.g., the past tense of ‘say’, but two distinct forms for the future. In view of this, however, one must consider the possibility that there is no unified root that is spelled out sometimes as /$\pi$go/ and at other times as /$\pi$went/, but rather, there are two distinct roots here, each with an incomplete paradigm. One expects such situations to be rare, of course, which indeed they are.

The picture nonetheless must be supplemented by another observation, due originally to Embick and Halle (2005), who likewise subscribe to the phonological reality of roots, and who are thus equally in need of accounting for cases of suppletion. As Embick and Halle note, and as is true both for the system outlined here and for that outlined in Distributed Morphology, suppletion is a common occurrence within the functional domain, but rather rare outside of it. To illustrate, ample discussion in Chapter 6 already concerned the multiple realizations of distinct C-functors. $C_{N[V]}$ ATK, I suggested, has all the spellout possibilities in (21a). While ance and ence as well as ancy and ency might be considered allomorphs, as would be, presumably, ation and (s)ion (but see fn. 30 of Chapter 7). It is very hard to see any coherent phonological theory that would map ance to ation or the other way around. Similar considerations hold for the proposed alternative realizations of $C_{A[N]}$ in (21b) and $C_{V[A/N]}$ in (21c):

$$(21) \begin{align*}
a. \quad C_{N[V]} & \rightarrow /_\pi ation; sion; tion; ance; ancy; ence; ency; al; ment/ \\
b. \quad C_{A[N]} & \rightarrow /_\pi al; ous; ic/ \\
c. \quad C_{V[A/N]} & \rightarrow /_\pi ize; ify; ate/
\end{align*}$$

We now note that the suppletion in (14) concerns, arguably, forms which are at the very least very “light” Content-wise, and quite plausibly well on their way to becoming members of the functional vocabulary. Similarly, and as already noted in Chapter 7, section 6, good and bad (as well as their comparative and superlative variants) are plausibly functional. The verb go, in turn, can function as a light verb, as may, arguably, the Hebrew correlate of say. If correct, then, this suggests that the suppression of paradigmatic cells is a necessary but not sufficient condition for

\begin{align*}
\text{(ii)} & \quad ani holex la.hagid ‘otax/\tilde{t}alayi ‘al tagid ‘al tagid \tilde{t}alayi ‘oti la-more \\
& \quad I go to.inform you/on-you to-the.teacher not inform on-me/me to-the.teacher ‘Don’t inform on me to the teacher!’
\end{align*}
the emergence of suppletion, and that such an occurrence is only possible for “light” or possibly “canonical” elements, or semi-functional elements, however ultimately described.

A specific challenge to this picture is presented in Harley (2009c) (and see also Harley, Tubino-Blanco, and Haugan 2009). Harley is, instead, committed to late insertion conditioned exclusively by syntactic context, and to the absence of fixed phonological properties for roots across all their occurrences. From her perspective, then, suppletion is precisely what would be expected, insofar as it establishes the absence of any inherent phonological properties for roots which must be preserved regardless of context, and from the perspective of the discussion here, argues against any phonological faithfulness. Thus in Hiaki, an Uto-Aztecan language, Harley notes, there exist suppletive forms (conditioned by number agreement) for verb Contents such as ‘run’ (vuite-tenne), ‘wander’ (weama-rehte), ‘enter’ (ivake-kiime), ‘lie’ (vo’e-to’e), ‘kill’ (mea-sua), ‘wake up’ (kecha-kha’abwa), as well as others, at least some of which could hardly qualify as light or canonical under any understanding of what “light” verbs might mean.28

The problem with the Harley argument, however, is that Hiaki as well as some other Uto-Aztecan languages appear to be the languages with the most suppletive forms in existence, but nonetheless there are altogether in Hiaki less than a dozen such cases (including light verbs and auxiliaries). While counting the total number of verbs in any given language is not a theory-neutral enterprise, it stands to reason that we are dealing, at the very least, with a 3 or 4 digit number, especially in languages which do allow verbs such as wonder or wake up to express relatively rich Content (in English, irregular verbs alone, and excluding auxiliaries and go, amount to more than 200 and as many as 500 according to some counts). In English (and in Hebrew, although incompletely), there is precisely one case of non-auxiliary verbal suppletion. In Hiaki, under the assumption that the total number of verbs is roughly the same, there are at most twelve, still making up for a miniscule portion of the vocabulary. If, indeed, roots do not have phonological properties as such, and if spellout is determined on the basis of bigger units, this becomes a pure coincidence which is much more in need of explanation than the existence of some language in which twelve cases of suppletion, in total, may exist.

In fact, a typological study by Veselinova (2006) is rather informative in this respect. Veselinova’s Table 17, reproduced below, is one of many tables giving us a good grasp of the pervasiveness of verbal suppletive forms and of the Content such suppletive forms correspond to (specifically relative to tense/aspect). In Table 17, and for any specific choice of lexeme, “No.” refers to the number of languages out of the total investigated that show suppletion for that lexeme. Weight value is calculated relative to the frequency of the lexeme in each language as a whole. What is entirely clear, and is a fact that Veselinova herself stresses, is that a handful of verb Contents are responsible for the overwhelming majority of cases of suppletion across all

28 That Uto-Aztecan “number suppletion pairs” are, in fact, cases of true suppletion is by no means agreed upon. At the very least, Mithun (1988) and Corbett (2000) argue that many if not all of these cases should be considered separate lexical items that are related semantically but not paradigmatically, and Veselinova (2006) remains very tentative about their suppletive nature.
languages. We note that the single instances of suppletion in English and Hebrew fall squarely within this generalization. We note further that go/come, exist, do, give, and take clearly can be used as light verbs in English, and that eat is used as a light verb in many a language. The most striking generalization that emerges from the table, then, does not concern the properties of suppletion, but rather the degree to which it is typologically absent. For proponents of roots without phonological information that, it would seem, is what is in need of explanation, rather than the existence of a handful of possible cases in which suppletion is attested. Finally, it goes without saying that insofar as the universal near absence of suppletion appears so glaring, viewing roots as phonological indices provides a direct account for it.29

(22) Veselinova’s Table 17. Lexemic groups with tense-aspect suppletion

<table>
<thead>
<tr>
<th>Meaning</th>
<th>No.</th>
<th>%</th>
<th>Weight</th>
<th>Value</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>come/go</td>
<td>59</td>
<td>24.90</td>
<td>11.142</td>
<td>21.81</td>
<td></td>
</tr>
<tr>
<td>be/exist</td>
<td>56</td>
<td>23.62</td>
<td>12.035</td>
<td>23.55</td>
<td></td>
</tr>
<tr>
<td>say/speak</td>
<td>19</td>
<td>8.02</td>
<td>5.565</td>
<td>10.89</td>
<td></td>
</tr>
<tr>
<td>give</td>
<td>11</td>
<td>4.64</td>
<td>3.530</td>
<td>6.91</td>
<td></td>
</tr>
<tr>
<td>see/watch/look</td>
<td>10</td>
<td>4.23</td>
<td>2.752</td>
<td>5.39</td>
<td></td>
</tr>
<tr>
<td>take</td>
<td>10</td>
<td>4.23</td>
<td>0.568</td>
<td>1.11</td>
<td></td>
</tr>
<tr>
<td>do</td>
<td>10</td>
<td>4.22</td>
<td>2.524</td>
<td>4.94</td>
<td></td>
</tr>
<tr>
<td>die</td>
<td>7</td>
<td>2.97</td>
<td>1.825</td>
<td>3.57</td>
<td></td>
</tr>
<tr>
<td>eat</td>
<td>7</td>
<td>2.97</td>
<td>1.675</td>
<td>3.28</td>
<td></td>
</tr>
<tr>
<td>sit/stand/stay</td>
<td>6</td>
<td>2.54</td>
<td>1.230</td>
<td>2.41</td>
<td></td>
</tr>
<tr>
<td>lay/put</td>
<td>6</td>
<td>2.54</td>
<td>0.181</td>
<td>0.35</td>
<td></td>
</tr>
<tr>
<td>have</td>
<td>5</td>
<td>2.12</td>
<td>1.390</td>
<td>2.72</td>
<td></td>
</tr>
<tr>
<td>bring/carry</td>
<td>3</td>
<td>1.26</td>
<td>0.580</td>
<td>1.14</td>
<td></td>
</tr>
<tr>
<td>become</td>
<td>3</td>
<td>1.26</td>
<td>0.460</td>
<td>0.90</td>
<td></td>
</tr>
<tr>
<td>get</td>
<td>2</td>
<td>0.84</td>
<td>0.188</td>
<td>0.36</td>
<td></td>
</tr>
<tr>
<td>hear</td>
<td>2</td>
<td>0.84</td>
<td>0.136</td>
<td>0.26</td>
<td></td>
</tr>
<tr>
<td>catch</td>
<td>2</td>
<td>0.84</td>
<td>0.028</td>
<td>0.05</td>
<td></td>
</tr>
<tr>
<td>throw</td>
<td>2</td>
<td>0.84</td>
<td>0.025</td>
<td>0.05</td>
<td></td>
</tr>
</tbody>
</table>

29 In the absence of root phonology, and wishing to claim that root Content likewise is otherwise assigned, Harley (2009c) (and see also Acquaviva 2008b) proposes that roots are indices. We note first that insofar as Harley (2009a, b) assumes, explicitly, that roots may assign an internal argument, it cannot be said that they are entirely devoid of Content, or, for that matter, of grammatical properties. Quite apart from this, we note that the presence of an index, typically intended to ensure some degree of faithfulness—most classically of reference—is vacuous unless one wishes to commit oneself to the domain within which faithfulness is to be defined. If a root can have distinct Content in distinct contexts and spell out differently in various contexts as well, it is not altogether clear what faithfulness is maintained, what the index is intended to accomplish, and whether, indeed, any degree of faithfulness can be thus accomplished. A similar proposal was already reviewed directly above in the context of the proposal that roots are empty sets advanced by De Belder and van Craenenbroeck (2011), and where I showed that such empty sets, indexed or otherwise, clearly cannot be the foundation for meaningful morphological explanations unless supplemented with some fixed point of reference within some domain.
drink 1 0.42 1.000 1.96
think so, happen, guess 1 0.42 1.000 1.96
become, happen, go 1 0.42 0.500 0.99
cry 1 0.42 0.125 0.24
fall 1 0.42 0.500 0.99
wake up 1 0.42 0.500 0.99
walk 1 0.42 0.500 0.99
hit 1 0.42 0.170 0.33
kill 1 0.42 0.170 0.33
run 1 0.42 0.170 0.33
shoot 1 0.42 0.170 0.33
strike, swear 1 0.42 0.170 0.33
become cold 1 0.42 0.165 0.33
cry 1 0.42 0.125 0.25
live 1 0.42 0.083 0.16
aim 1 0.42 0.014 0.02
beat 1 0.42 0.011 0.02
move 1 0.42 0.007 0.01
Total 237 100.00 51.089 100.00

8.3 But do Roots Have (Syntactically Active) Content, Nonetheless?

While in Borer (2005a,b) I assumed that root (or “listeme”) Content is inert, but nonetheless present, I have been assuming throughout this work that roots do not have Content as such. As we shall see in Chapter 9, Content is matched once, and with syntactic domains which, while possibly coextensive with roots, are also potentially bigger. Insofar as Content matching to any given string only occurs once, I specifically assume that there is no basic Content to roots such that it must be pre-empted or overridden once a potentially distinct Content is assigned to bigger units.

Some arguments against root Content were already reviewed in sections 8.1.1. and 8.1.2., insofar as the argument for the phonological reality of roots such as \( \sqrt{ceive} \) and \( \sqrt{pqd} \) was fundamentally based on the fact that they are clearly basic building blocks which are bigger than phonemes, but are nonetheless Content-less.

Nonetheless, the assumption that the smallest building block of words, call it stem or morpheme or root, has syntactically active Content has a long history and is rather widely held, not only within lexicalist grammars and lexicalist approaches to complex words, but also within the Extended Standard Theory and its descendants, Government and Binding and Minimalism, and is furthermore extremely common in present day, Minimalist attempts to explicate the properties of words by appealing to syntactic structures. The matter was already discussed in some detail in Chapter 1, as well as in Borer (2003, 2005a, b). Seeking to streamline the discussion and avoid repetition, I will restrict my review of such proposals to those which are syntactic and root-based, and which explicitly seek to limit the syntactic power of the lexicon.
Of the models seeking to achieve such a result, certainly the best known one is Distributed Morphology in its several present-day instantiations. In turn, and as already noted at various points during our discussion of de-verbal nominals, Marantz (1997 and subsequent work) explicitly assumes that root Content is responsible for the assignment, in syntax, of the internal argument, and that it further constrains the structural realization of some external arguments as well. To wit, insofar as one must appeal to the incompatibility of √GROW with an open interpretation possessor, and to its need to have exclusively an external cause as its external argument, and insofar as External Causers are assumed to require the projection of v, the inevitable conclusion is that the Content of √GROW is responsible not only for the assignment of an internal argument, but also for the licensing of an external argument in a particular syntactic position as well, and hence for giving the syntax specific structural information about tree construction (and see Chapter 7, section 3.4 for discussion). The claim that roots select their internal argument has been even more strongly endorsed by Harley (2009a, b), insofar as in her system (but not in that of Marantz) arguments merge as direct sisters of the root, which in turn projects, so as to give rise to a RootP (cf. (23a)). Finally, Embick (2004, 2010, i.a.) suggests that roots are divided into eventive (or resultative) and stative, and that argument structure may be associated with the former, in any categorial instantiation, but not with the latter. Unlike Harley (2009a, b), however, for Marantz and at least in some cases for Embick, the licensing of arguments requires categorization, and it is only in conjunction with such categorization that root arguments may be assigned, giving rise to (23b):

(23)  a.  
\[
\begin{array}{c}
\sqrt{\text{DRIVE}} \\
\rightarrow \\
v^0 \\
\end{array} 
\begin{array}{c}
\sqrt{\text{P}} \\
\rightarrow \\
v^0 \\
\end{array} 
\begin{array}{c}
\rightarrow \\
\text{DP} \\
\end{array}
\]

b.  
\[
\begin{array}{c}
\sqrt{\text{DRIVE}} \\
\rightarrow \\
v \\
\rightarrow \\
\text{[+eventive]} \\
\text{DP} \\
\end{array}
\]

Considering first the merger configuration in (23a), we note that it suffers from a certain vagueness as to what happens to the internal argument of the root if the root merges with \(n\) or with \(a\) rather than with \(v\). While some nouns may be argued to take arguments directly, in that approach (to give rise, specifically, to AS-nominals), some certainly do not, and neither do adjectives. Consider, for instance, the root round, which, plausibly, may either merge with \(v\), \(n\), or with \(a\), all three instantiated as zero in this case. In its verbal use (and note that there is more than one Content involved, including the mathematical one), it takes an argument. Not so, however, in the case of adjectives. In its nominal use, it might be said perhaps to take an argument (e.g. a round of applause, a round of poker), but that argument is clearly associated with a very different Content of round from that which is brought to bear on the argument in the verbal instantiation as in e.g. round up the students or round the corner. But if categorization applies to the output of root–argument merger, it is not
clear how these relatively straightforward distinctions can be captured. If, on the other hand, as appears to be the case in Embick (2004), arguments may either merge directly with the root or alternatively with a categorial projection (and with the same root involved), it becomes rather unclear what, exactly, it means for a root to select an argument, and under what structural circumstances such a selection is met.

An additional complication emerges for (23a) once we consider the fact that derived verbs take arguments, which, in that case, can hardly come from the root. The difficulty is not just a matter of execution, but rather involves a fairly radical undermining of the rationale guiding the claim that roots have internal arguments to begin with. To see that this is the case, consider the structure that Harley (2009a) herself assigns to derived verbs. Specifically, in (24), the root √GLOB incorporates into the (little) a head (which spells out as -al), and the result, global, incorporates into -ize. The DP markets, in turn, is not in actuality an internal argument in the traditional sense, but rather a specifier, the external argument of a (little) a Small Clause, headed by (√GLOB)-al (accusative assigning structure omitted for expository reasons). The compositional meaning of globalize, then, is to ‘make x global’:

(24)  

\[ \begin{align*}  
\text{a.} & \quad \text{The IMF globalizes markets} \\
\text{b.} & \quad [\text{v} \ -\text{ize} \ ... \ [\text{a-sc} \ [\text{DP markets}] \ [a \ \text{al}_{a} \ \text{√GLOB}]]] \\
\text{c.} & \quad [\text{v} \ \text{√GLOB-al-ize} \ [\text{a-sc} \ [\text{DP markets}] \ [a \ \text{√GLOB-al} \ \text{√GLOB}]]] 
\end{align*} \]

Quite regardless of the merits or demerits of the derivation in (24), however, it is clear that [DPmarkets] is not an argument of the root, the only root in evidence being √GLOB, and that, in fact, [DPmarkets] is assigned role without any contribution from any listed root. In other words, the role is structurally assigned, rather than lexically specified. But if structural role assignment is available for what looks, to all intents and purposes, the internal argument of globalize, what evidence do we have that any “internal” arguments are ever complements which are semantically contingent on some root (or verb), and which merge with such a root (or a verb)? The alternative is to rather generate these in some functional specifier position, where they are systematically assigned a role structurally, rather than through root selection, either along the lines originally suggested by Hale and Keyser (1993) or in line with a number of subsequent executions, including those in Borer (1994, 2005b). All the more so as in a different context, Harley (2009b) proposes that all arguments of change-of-state verbs (unaccusative and transitive) are likewise subjects of Small Clauses. Finally, and to further complicate matters, overt verbalizers can also merge with what otherwise may be realized as underived nouns and adjectives, and the Content (or a close approximate) expressed by such complex forms can also be expressed without any overt affixation altogether, as exemplified in (25):

(25)  

\[ \begin{align*}  
\text{a.} & \quad \text{privatize the railroads} \quad \text{cf.} \quad \text{sell/transfer the railroads} \\
\text{b.} & \quad \text{publicize the product} \quad \text{cf.} \quad \text{market the product} \\
\text{c.} & \quad \text{patronize the bar} \quad \text{cf.} \quad \text{visit the bar} \\
\text{d.} & \quad \text{liquefy/liquidize/liquidate the butter} \quad \text{cf.} \quad \text{melt the butter} 
\end{align*} \]
The problem now is that it is extremely difficult to determine when, or why, it is ever necessary for the root to assign an internal argument, and when such an argument may come about as a result of the existence of a derived form or an affix. Suppose, specifically, that we wish to avoid the claim that in liquidize, publicize or privatize it is √LIQUID, √PUBLIC or √PRIVATE, as such, which assign an internal argument. For √LIQUID or √PUBLIC or √PRIVATE, then, the only plausible option would be to suggest that butter, product, and railroad merge as the specifiers of some presumably categorized Small Clause constituent which contains these roots, thereby reducing them to approximations of MAKE [the butter liquid], MAKE [the railroads private], MAKE [the product public], and so on, where the root, if it does indeed play a role, is at best the predicate (or a predicate modifier) and the role actually assigned is “external”. The obvious question, then, is why give a different analysis to sell/transfer, to market and to melt? Why not assume that here too the internal argument is but a specifier of some categorized constituent (e.g. MAKE [the railroads (be) transfer (ed)]? However, if that is indeed the case, little remains of the argument that roots, as such, assign arguments, as equivalent arguments with equivalent event structure clearly have to be assigned in some functional specifier and away from the properties of the roots as such.

The problem is of course compounded by cases in which no Small Clause analysis of any sort is potentially available for a derived verb from which argument assignment could possibly emerge. Consider, for instance, energize, as in he energized the work force. Unlike e.g. privatize, where private functions as a predicate, in energize, it appears, energy itself is interpreted as an argument, of sorts (gave energy to the workforce . . .), and where energy altogether cannot be interpreted as a predicate taking the workforce as its external argument. Here, too, underived forms could convey a very similar meaning (e.g. cheer the workforce), yet again leading one to wonder why any arguments should be assigned by the root, given the inevitable conclusion that the very same argument configurations can emerge in the clear absence of any root intervention.30

Consider now the structure in (23b). At least prima facie, and depending on the execution, it is possible to solve the first problem noted for (23a), i.e. that involving the distinct assignment of argumental roles by nouns, adjectives, and verbs. Relative to (23b), rather, it is possible to claim that the internal argument of the root is optional in the context of n, absent in the context of a, but obligatory in the context of v.31 In turn, insofar as the argument in (23b) is, explicitly, an argument of the root, some additional mechanism is needed, involving presumably percolation or similar, to resolve the non-local merger of the argument. We note that such a percolation must allow percolation over overt realizations of v, such as ize, which are structurally identical to O-realizations of v. We note further that the categorial

30 And see Chapter 12 for some additional discussion of these issues in the context of Synthetic Compounds.
31 As such, the structure in (23b) directly mimics the system presented in Chomsky (1970), where “roots” are embedded under syntactic structure which in turn determines the realization of arguments (or more accurately, of subcategorization), thereby allowing the complements of N to be optional.
status of the root in both (23a) and (23b) remains rather unclear. Within the Harley system (and see also some structures in Embick 2004), the problem is actually less severe, insofar as the root could be an underspecified or unspecified category. Under the execution in (23b), however, roots emerge as an altogether novel syntactic object, a point already made in Chapter 7.

Like (23a), (23b) also suffers from the uneasy accommodation of complex verbs. While, by assumption, the role of the root could percolate up to $v$, that would not suffice to resolve the problems already pointed out concerning the relationship between $glob$, $global$, and $globalize$, where $\sqrt{GLOB}$ can hardly be said to be providing the argument in question, and even if it did, the percolation would require moving past $a$ as well as past $v$. Similarly, in such cases, it is hard to see how the root, e.g. $\sqrt{GLOB}$, could possibly be considered as a modifier of an event, or in what sense it could be considered an eventive or resultative root, so as to allow whatever argument ends up occurring in conjunction with $globalize$.

A more fully articulated system which assigns roots to different semantic stock is presented in Alexiadou, Anagnostopoulou, and Schäfer (2006) as well as Alexiadou (2010). The system, specifically, appeals to the Content of roots in attempting to account for root alternations, and is summarized in (26):

(26) Verbal meanings represented by a root/core component can be classified as follows:

a. $\sqrt{agentive}$ ($murder$, $assassinate$)

b. $\sqrt{internally caused}$ ($blossom$, $wilt$)

c. $\sqrt{externally caused}$ ($destroy$, $kill$)

d. $\sqrt{cause unspecified}$ ($break$, $open$)

(Alexiadou 2010, p. 179, citing Alexiadou et al. 2006)

These classes, it is argued, differ in terms of the way in which the events they describe are conceptualized. Most importantly, for the claims put forward here, Alexiadou et al. (2006) and Alexiadou (2010) argue that an event involving agentive roots requires the presence of an Agent, and as a result, these roots are not expected to alternate, i.e. to occur in multiple event types. In short, then, the claim is that some roots, by virtue of what I refer to as their Content, and what is at times, and within a different set of assumptions, referred to as their Lexical Semantics, require an Agent, thereby delimiting through their semantics their syntactic merger environments. If indeed correct, such a claim perforce requires roots to have a grammatically relevant Content, and to deploy it sufficiently early in the derivational process so as to guide the progression of Merge.

We note, before proceeding, that $assassinate$ makes for a poor example of an agentive root Content, being itself a complex word already derived from an item (noun or root) with an agentive Content, i.e. $assassin$. Focusing, however, on $murder$, as well as presumably $slay$ and $shoot$, we note that even if we assume without further discussion the veracity of the empirical claim that, e.g., $murder$ and $slay$ do not occur in multiple event types and that this is because of the presence of an agentive interpretation, the conclusion as concerning root typology is by no means necessary
and is, in fact, rather problematic, theoretically speaking. The title of the examples in (26), taken verbatim from Alexiadou et al. (2006), already tiptoes around the root/core of the theoretical problem—if the existence of an Agent, as such, is contingent on roots, it is not clear why grammatical Agents are only obligatorily instantiated in verbal contexts, or, indeed, why it is only in verbal contexts that the verbal meaning (sic) is instantiated. Nor is it clear what the root/core component contributes when the category is not verbal, and where, e.g., an Agent may be altogether missing. Thus it is not clear that a shot is agentive, or that it can take any arguments, or, for that matter, that it need be associated with an event at all. Nor is it obvious in what sense the agentive Content of a root is realized in its adjectival derivatives. Thus, while one might claim that a murderous gaze embeds some agentivity within it, articulating the actual syntax that this would entail is an extremely tricky matter. If, in turn, the lexical semantics under consideration is associated with verbs, then it is entirely compatible with the claim that the root, as such, need not have independent Content. Taken more broadly, there is absolutely nothing about Alexiadou’s typology, as stated in (26), which forces the Content under consideration to be associated with roots rather than with syntactic constituents of some size.\textsuperscript{32}

8.3.1\textit{ A note on over-generation}

It is worthwhile taking a step back at this point to review at least some of the underlying motivation for postulating a semantically-based typology for roots within approaches that subscribe to the central role of roots in the syntactic construction of words. If, as syntactic root-based approaches would have it, roots are devoid of syntactic properties, and if, as at least some root-based approaches would have it, the syntax cannot be assumed to project from the lexical semantics of listed items, be they roots or categorized listed elements, then one of the major consequences is that such systems cannot avail themselves of the rich descriptive mechanisms of lexical semantics that were used throughout the 1980s and 90s within lexicalist approaches to delimit the range of possible syntactic trees in the context of a particular vocabulary choice. In turn, and insofar as lexical-semantic accounts of syntactic structure were descriptively adequate, such descriptive adequacy was achieved at the cost of massive under-generation. Specifically, such adequacy was achieved by reducing the first tier

\textsuperscript{32} Note, in this context, that the distinction between an External Causer and an Agent, which is at least at times claimed to be grammatically (and morphologically) marked (see in particular Doron 2003) and which is at the heart of the Alexiadou et al. (2006) typology, is not nearly as item-rigid as one would expect, and is certainly tied to neither roots nor verbs, as the cases in (i) illustrate. Thus while the grammaticalization of the distinction is certainly a possibility, that the source of the distinction is root-, or verb-related, rather than structure-related, is by no means obvious:

(i) a. The accident destroyed my desire to travel.
   b. My administration’s attitude killed my will to stay around here.
   c. Netanyahu’s refusal to halt the settlements murdered the peace accords.
   d. Her recipe for success slayed the dragons.

(http://www.thejc.com/lifestyle/food/41899/her-recipe-success-slayed-dragons)
of syntactic representation to listed properties. In contrast, once such lexico-semantic
driven syntactic mechanisms are abandoned, systems tend to over-generate, and it is
precisely the attempt to cut back on such over-generation that underlies the proposal

Although all present root-based syntactic systems do over-generate, depending on
various other aspects of the model they do not necessarily over-generate in an
identical fashion, signaling, at the very least, that they are not in fact notational
variants of each other. Suppose we consider, by way of comparison, some execution
within Distributed Morphology and The Exo-Skeletal Model. Both systems, as it
turns out, suffer from an inherent difficulty in characterizing the richness of argument
arrays that are at times attested with specific verbs, and which require specification
well beyond what an internal argument on a root might require in DM, or no
argumental specification at all can accomplish, as in XSM. A few representative
illustrations are in (27)–(29), concerning specifically the extension, or lack thereof,
of the spray/load alternation (in (27)) and cases of obligatory transitivity, likewise
problematic in an identical way for both models (as in the contrast between (28) and
(29)). We note that the typology offered by Alexiadou et al. (2006) and reviewed
above is motivated by the search for a solution for such contrasts. As already noted,
however, it remains unclear that the generalizations captured, to the extent they are
valid, concern roots, rather than categorized, Contented constituents:33

(27) a. spray the wall with the paint/spray the paint on the wall
   b. fill the sink with water/*fill the water into the sink

(28) a. Mary melted/twisted/sank DP
   b. DP, melted/sank/twisted

(29) a. Mary destroyed/consumed/killed DP
   b. *DP, destroyed/consumed/killed

As it turns out, however, at least some Distributed Morphology executions suffer
from an additional over-generation problem which the Exo-Skeletal Model is spared.
That problem is the one already noted above which concerns the inability inherent in
the system to predict when a root would have an argument and when not, and when
that argument would or would not be realized. Specifically, consider the roots in (30)
within a framework that allows roots to select internal arguments:

33 By way of tentative remedy, I propose in Borer (2005b) that in cases such as those in (27)–(29) and
similar, the verb is in actuality a complex constituent, containing an incorporated ExP-segment which
requires the specific argumental instantiation attested. The prediction directly made by that claim is that
such verbs would not have a zero noun correlate. In the absence of zero-categorizers in English, recall, zero
noun–verb alternation emerges exclusively from embedding roots in distinct syntactic contexts. If,
however, the verb in (27)–(29) incorporates an ExP-segment, it is no longer a root and is rather categorized.
As it turns out, most, although possibly not all, cases in (27)–(29) confirm the prediction, including in the
case of fill. The kill, however, is attested as a fully licit noun contrary to prediction:

(i) a. the paint; the spray; the melt; the twist; the sink
   b. *the fill; *the destroy; *the consume

Considerations of space dictate that this matter be left, yet again, to future research.
Everything else being equal, and without appealing to any inherent properties which distinguish between √TABLE and √BREAK, the fact that the latter, but not the former, may have an argument is not an easy matter to characterize. The problem is compounded by the fact that for DM, the roots √BREAK and √DESTROY must be assumed to have both a verbal and a nominal instantiation, each augmented with a projecting category label, and hence as in (31):

(31) \[ n_\emptyset [\sqrt{\text{BREAK}}]; \; [n_{\text{ion}} [\sqrt{\text{DESTROY}}]; \; [v_\emptyset [\sqrt{\text{BREAK}}]); \; [v_\emptyset [\sqrt{\text{DESTROY}}] \]

break destruction break destroy

The verbal instantiations of the root would get to keep the argument. Of the nominal instantiations, destruction would be allowed to keep it (the destruction of the city), but only optionally, and break, or so it would appear, would not (recall that “zero-derived” Ns do not have argument structure, and hence *the break of the glass). To be licit as a nominal, \([v [\sqrt{\text{BREAK}}]\)] would need to merge with \(n\), to spell out as ing, in which case the internal argument of √BREAK would be realized, but in a verbal rather than nominal context. But why should √DESTROY be allowed to have an argument optionally in a nominal context, but not so √BREAK? Why should the \(n\) when realized as /\text{ation}/ allow the root argument to be instantiated, in other words, but not so \(n\) when realized as /\text{e}/? Nor is it clear in what sense √BREAK is different from √TABLE, given the fact that both of them are unable to have any argument in a nominal context.

The root typology presented in Embick (2004) is proposed with the intention of solving at least some of these issues. Thus consider the possibility that √TABLE is stative, in some important sense, while √DESTROY is eventive, and let us further assume that the ability to assign an argument is a hallmark of eventive predicates. At least some aspects of the problem, or so it appears, vanish. Specifically, that √TABLE must be a noun and may not have an argument, as well as the existence of √DESTROY with an argument in both its verbal and nominal instantiations, presumably would now follow. We note, however, that the proposal still falls short of explaining where the argument of √DESTROY may have vanished to in the destruction was devastating, or why \([n_\emptyset [\sqrt{\text{BREAK}}]\)] cannot have arguments. The proposal falls even shorter when attempting to account for the actual grammaticality of virtually all roots in English in verbal contexts, regardless of their Content:

(32) a. I tabled the motion
   b. I windowed the sample

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34 For a recent (self-declared as failed) attempt to apply consistently the eventive/stative typology to English roots, see Rimell (2010). For a few more comments on this issue, see Chapter 9, section 1.3.
Finally, on the conceptual level, we note that classifying roots into *eventive* and *stative* so as to give rise to meaningful empirical results is, to begin with, fundamentally incompatible with the properties of nominals, already discussed and noted extensively in this work. English, recall, has a large stock of simple event nominals which are not derived from verbs and which cannot be AS-nominals, such as *event, class, course, concert, opera,* among others. If the roots of these expressions are *eventive,* the absence of arguments remains inexplicable. If these are to be classified as *stative,* on the other hand, the problematic duality of the term “event” as introduced in Grimshaw (1990) and resolved here re-emerges, leading to the need to distinguish between complex events, which can take arguments and have verbal correlates, and simple events, which do not, a classification that may only avail itself of a posteriori factors.

When we now turn to XSM, we find that this entire host of problems is simply not there. In XSM, no roots have arguments, nor do they have any semantic properties which classify them into types; thus there is no in-principle distinction between \( π√\text{table}, deπ√\text{stroy}, π√\text{car}, \) or \( π√\text{break}.\) Arguments, rather, are associated with ExP-segments, and with the latter specifically members of either \{Ex[V]\} or \{Ex[A]\}. As a result, the C-core associated with these Extended Projections is rendered either V-equivalent or A-equivalent. It thus emerges that nouns as such never have arguments, and any appearance to the contrary is the result of the formation of an AS-nominal, complete with either an \{Ex[V]\} or an \{Ex[A]\} within the scope of the relevant nominalizing functor. That neither the table nor the break have arguments now follows directly from the fact that they are N-equivalent roots, and identically so. Finally, XSM predicts that any root should be licit in both nominal and verbal context. The grammaticality of (32a–b) is thus the direct consequence.35

It thus emerges that the classification of roots into *eventive* and *stative* will accomplish little work in XSM beyond ruling out (32a–b) inappropriately, and losing us, summarily, the ability to account for the impossibility of argument structure with the break. As the classification stands, it is intended to solve a DM theory-internal problem fundamentally linked to the availability of root-selected arguments which does not exist in XSM. To the extent that it does offer a solution, in view of the failure to predict the grammaticality of (32a–b) and similar cases, as well as the failure to predict the impossibility of arguments with any “zero-derived” nouns, the solution appears limited indeed.

35 XSM does run into a bit of a snag when faced with the infelicitous occurrence of /\textit{destroy}/ as N-equivalent, under the assumption that \textit{destroy} is a root. The problem, however, is neither bigger nor smaller than that which would need to be resolved to account for the absence of a \( \Theta \) realization for \( n \) in \([n \ [\text{DESTROY}]] \) in DM or, for that matter, in Kiparsky’s (1982a) system. We note, in this context, that the problem tends to plague most compound roots, and may suggest that they are, in fact, categorized by the prefix particle, thereby accounting for their exclusion (with few exceptions) in nominal contexts. See fn. 13 of Chapter 7 for some relevant discussion.
8.4 Coercion—One More Argument for No-Content Roots

In Borer (2005a, b), “listemes”, now re-labeled as “roots”, are assumed to consist of conceptual meaning, Content, combined with a phonological index. Although in that work I explicitly bar the Content of roots from participating in the syntactic computation in any way, I do assume that each root carries a fixed concept with it throughout the derivation, to be “revealed”, so to speak, at the endpoint of the computational process, in the “making sense” area of the grammar, where concepts derived from world knowledge and formal semantic representations by assumption come together. That picture was intended to account for what is typically labeled “coercion”—cases in which the grammatical interpretation forces non-canonical construal on some concepts, and where what was coerced, I assumed, was specifically root Content. One such instance of coercion is the imposition of a mass reading on what are, plausibly, “count” concepts, as in (33), or conversely, of a count reading on canonically mass concepts, as in (34):

(33) a. too little table for the money
    b. there’s dog in the stew

(34) a. three bloods in the lab
    b. a large selection of meats/cheeses

A closer scrutiny of the facts reveals, however, that coercion of the mass–count type is not restricted to roots. Equally coercive effects are attested in the following cases, in which the relevant nouns are clearly derived:

(35) a. forbidden knowledges
    b. 69 Wisdoms and Axioms for Modern Life
    c. Where to Go to See Fall Foliages

(36) a. that’s way too little technician for the money
    b. there’s (too much) tourist/traveler in the stew

Viewed as a diagnostic for the presence of a root, it is thus clear that fluctuation of the mass–count type behaves rather differently from contextual categorization. The latter, recall, was never available to derivatives and was attested with roots alone. The derivatives in (35)–(36) are no exceptions, showing no categorial malleability whatsoever, and contrasting thus with the forms in (33)–(34), arguably roots, which can occur in distinct categorical contexts:

(37) a. *to knowledge; *to wisdom; *to aviator; *to librarian
    b. *a harmonize; *an instantiate; *a liquefy

(38) a. to blood; to dog; to table; to meat
    b. a drive; a think; a listen

The contrast suggests rather clearly that what is involved in Content coercion of the type licit in both derived and underived forms affects a constituent which is distinct from the root. Suppose we assume now, as appears parsimonious enough,
that neither category nor Content can be changed, as such, and rather, once assigned, are always present. Specifically, and as discussed at some length already, the reason for the ungrammaticality of the derivatives in (37a–b) resides in the fact that the forms are categorized already, and cannot be recategorized. Not so the forms in (38), which are category-less roots, and hence can be rendered category-equivalent by their syntactic context.

Consider, however, coercion: an effect born of a conflict between grammatical interpretation and non-grammatical conceptual knowledge, however represented. The grammatical interpretation is that which comes from the internal structure of the DP and which signals mass or count, respectively. The non-grammatical Content, on the other hand, is that of BLOOD, CHEESE, and DOG, as well as of KNOWLEDGE, WISDOM, TOURIST, FOLIAGE, etc., with whatever properties they might have. Coercion in, e.g., (36b) emerges from the fact that the Content TOURIST strongly predisposes us towards count, but the structure associated with the expression is that of grammatical mass. Identical effects are attested with the Content of the underived DOG. Similarly, whatever coercion emerges in (35c) stems from the preference for a mass Content for FOLIAGE. As such, embedding it in a grammatically count context creates effects that are neither stronger nor weaker than those created by CHEESE.

The preliminary conclusion from these observations is clear. Insofar as we can say that coercion presupposes Content, for otherwise nothing could be coerced, such Content need not be associated with roots, but could be associated with derivatives as well, and in fact, when it comes to Content coercion, the distinction between roots and derivatives appears useless. If we proceed to assume that just like category, Content cannot be changed once assigned, the inevitable conclusion is not only that Content need not be assigned to roots, but that in some contexts, it cannot be assigned to roots. Rather, from the perspective of the coercion effects in (33)–(36), it appears that the relevant Content is that associated with N, and that the manner in which the constituent under consideration came to be N, or how complex it is, turns out to be irrelevant.

A considerably deeper conclusion emerges as well, once we compare the existence of coercion effects in (33)–(36) to contexts in which coercion could be expected, but is nonetheless not attested. Thus consider specifically the “coercive” effects in too much traveler. These appear straightforward enough. Traveler has Content, TRAVELER, which consists in being human (or possibly a highly sentient alien) who engages in

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36 It is at times proposed that particular instantiations of n, or in our terms $C_N[X]$, come with a specific grammatical flavor. One such proposed flavor concerns the suffix -age, which certainly favors mass interpretation both in English and in French. Insofar as it can be coerced, however, as in the corpus case foliages, it suggests that the mass status of -age is no different from that of roots. The meaning of foliage, complete with -age, is, in other words, a creature of Content and not a creature of grammar, and hence coercible. That, we note, is in sharp contrast with its N-projecting property: *to foliage remains straightforwardly ungrammatical, regardless of the possibility of foliages.
TRAVEL, however one should choose to characterize that Content. Suppose we now view coercion as an accommodation effect that emerges specifically whenever some conceptual knowledge, some Content, must be suppressed in order to accommodate either a conflicting Content or an interpretation which otherwise emerges through the existence of rigid grammatical/semantic representations. Insofar as humans are primarily perceived as units, rather than stuff, much traveler requires the suppression of some Content and “coercion” is what emerges.\(^{37}\)

Consider now this conclusion in view of the existence, in English, of the compound fellow traveler, sufficiently obscure in present-day use that its Content must be explained, thereby attesting to its non-compositional nature. Between the early 1930s and the late 60s, however, it was in common use in reference to individuals who were sympathizers of the American Communist Party. As is self-evident, some fundamental properties of the Content TRAVELER are altogether missing from the Content FELLOW TRAVELER. The reference under consideration is still HUMAN, to be sure (but not a sentient alien, note), but the Content TRAVEL has been altogether suppressed. And yet, no coercive effects whatsoever emerge. Unlike our TRAVELER in the stew, where the suppression of at least some aspects of the Content gave rise to coercion, the suppression of the Content TRAVEL(ER) in FELLOW TRAVELER creates no coercive effects whatsoever. Nor is this, of course, an unusual case—Content is regularly “suppressed” in compounds and in derivatives, many of which are non-compositional without giving rise to any coercion. Thus for example an adjective such as accomplished on its ‘skillful, talented’ reading bears no direct Content relations to ACCOMPLISH and editorialize on its SERMONIZE reading bears no Content relations to EDIT, and yet no coercion effects emerge.

But why should that be so? Seeking to create an even more minimal contrast with compounds, note that coercion effects are the direct source of the effect of the famous example in (39a). If we consider specifically the expression colorless green ideas, where coercive effects are certainly in evidence, one must ask what distinguishes it from compounds such as those in (39b), where suppressing the Content of straw or man or red or flag fails to give rise to any coercive effects:

\[
(39) \quad \begin{align*}
&\text{a. colorless green ideas (sleep furiously)} \\
&\text{b. straw man; strawberry; red flag}
\end{align*}
\]

Suppose one were to assign to accomplished the structure in (40a) and to fellow traveler the structures in either (40b) or (40c) (and see Chapter 12 on the choice between these possibilities):

\[37\] As I observe in Borer (2005a), when such a conflict involves Content and grammatical representations, the grammatical representations always prevail. The accommodation required between conflicting Contents may follow different strategies, and no claims are made here about what such strategies might be, or what the source or the formal nature of their existence is.
Abstracting away as much as possible from the specific position of adjectives or from the details of Extended Projection structure, it is nonetheless fair to say that the structure of colorless green ideas (or, for that matter, colorless green traveler) is roughly along the lines of (41), and with ∈{Ex[N]} in reference to some nominal ExP-segment or segments which either merge with CL or dominate it, and with adjectives either specifiers of, or adjunctions to, some ExP-segments. As such, they potentially merge with CL or higher, but clearly not lower:

From the perspective of the building blocks of our system, the difference between the structures in (40) and the structure in (41) cannot involve complexity, nor can it involve some putative distinction between roots and categorized constituents, given the fact that traveler is unambiguously categorized under anybody’s account. Finally, the difference cannot involve the presence of C-functors, as ER_N[v] is a C-functor and C-functors, as such, are certainly not barred in (41). The difference could, however, and I will proceed to argue directly that it does, involve the presence in (41), but not in (40a–b), of ExP-segments which intervene between the specific Content-carrying
terminals in the structure. We note that there are no such ExP-segments in (40a–b), and that in these cases, whatever Content may be associated with /travel/, /traveler/, or /accomplish/ in isolation is simply not present. It has not been suppressed, precisely because such suppression, by assumption, would leave a coercive residue. Rather, it appears that it was simply never there. Not so for (41), where an ExP-segment, CL, isolates ideas (and traveler) from both green and colorless, and where an ExP-segment further isolates green from colorless. Here, it appears, the Content units TRAVELER, IDEA(S), GREEN, and COLORLESS do exist, and insofar as these Content units are uncomfortable with each other, a coercive effect emerges.

But if that is, indeed, the accurate generalization governing the emergence of coercion, as well as the failure of such coercion to affect FELLOW TRAVELER, ACCOMPLISHED and many others, then what emerges directly is not only that we must assume the existence of roots without Content, such as √ceive and √pqd, and not only that the Content of roots, as such, appears irrelevant when attempting to account for the coercion effects in (33)–(34) and (35)–(36), but that a considerably stronger conclusion is warranted. According to this conclusion, it cannot possibly be the case that roots, as such, have Content, for if such Content were in place, any non-compositional structure embedding such Contentful roots would be predicted to give rise to coercion effects. And yet, non-compositionality is in all likelihood the single strongest “word-specific” effect associated with complex morphological structures, and coercion effects are never in evidence. The weakest possible claim would be that any root which is embedded in a structure with non-compositional Content cannot itself have Content. This “weakest claim” is however unverifiable, insofar as new compounds are constantly introduced into the language, and quite a few of them are non-compositional (network being a case in point). A considerably more robust conclusion would be to simply eliminate Content from the domain of roots, and instead suggest, along the lines just outlined, that the domain of Content is defined by ExP-segments, a task that will be directly undertaken in Chapter 9. We note, before moving on, that insofar as a coercion effect is attested specifically in (33)–(34), repeated below, it indicates that the underlined constituents, whatever their structure, constitute Content domains, or coercion, by assumption, could not have emerged:

(42) a. too little table for the money
    b. there’s ___ dog in the stew

(43) a. three ___ bloods in the lab
    b. a large selection of ___ meats

(44) a. forbidden knowledges
    b. 69 Wisdoms and Axioms for Modern Life
    c. refrigerated ___ storages

38 Pluralia tantum, note, do allow non-compositional Content, complete with a plural marker. I return to this matter in some detail in section 4 of Chapter 10.
(45) a. that's way too little librarian for the money
   b. there's (too much) tourist/traveler in the stew

A final observation is warranted. Note that the Content ACCOMPLISHED certainly can be distinct from the Content ACCOMPLISH. However, accomplishment, accomplishable, and accomplisher are fully compositional, and directly contain the Content ACCOMPLISH. They do not share the Content ACCOMPLISHED, nor do they have one distinct from that of ACCOMPLISH to offer. In addition to bolstering the conclusion that whatever Content ACCOMPLISHED has cannot be traced back to the Content of some root, this observation points to an important role played in the emergence of Content by the properties of the C-functor. As I shall argue, the relevant properties are, yet again, phonological.  

39 The discussion up to this point is certainly compatible with the claim that derivation is lexical but inflection is syntactic, and that non-compositionality is only available lexically. Insofar as what is lexical and what is syntactic is, however, frequently defined by appealing to non-compositionality, this is circular. Viewed differently, if the attempt to delimit non-compositionality by coherent syntactic configuration, and specifically to that of the C-core, is successful, there remains little reason to assume the domain is specifically a non-syntactic one.

Quite aside from these conceptual issues, and as will be argued in Chapter 9, the model proposed here makes different predictions with regard to the emergence of non-compositionality from lexicalist models, and as a consequence, empirical evidence can be directly brought to bear on the issue, so as to show that a syntactic approach is, in fact, more explanatory.
Structuring Content

9.1 Two Puzzles: R-nominals vs. AS-nominals

9.1.1 Preliminaries

Broadly speaking, Chapters 6 and 7 were devoted to an elaboration of the form and construction of the “exo-skeleton”, focusing on the properties of functors and on the nature of categories and categorization. Within the exo-skeleton, however, there resides “stuff”, that which, by assumption, is shaped by the structure outlined in those chapters.

Roots, insofar as they do not have any syntactic properties, are thus “stuff” in the intended sense. Throughout this work, I have been assuming that roots are creatures of phonology, an assumption that I proceeded to motivate in Chapter 8. Effectively, roots here are no more than indices referring to listed, otherwise underived phonological information packets. Roots however are not, in and of themselves, responsible for the emergence of Content. While the grammatical units which are mapped onto Content may happen to be co-extensive, phonologically, with roots, this is by no means necessarily the case, nor are roots, in the intended sense, specifically privileged when it comes to Content. Nonetheless, as I shall argue, Content is sensitive to phonological information, including, but not exclusively, that associated with roots. Specifically, Content is a process of matching qualifying chunks of conceptual knowledge onto grammatically-qualifying phonological representations. However, the search engine which scans, so to speak, grammatical representations in search of such qualifying strings, the “en-search” engine, is not looking for roots, nor are roots, as such, a well-defined unit for such searches.

Suppose, then, we assume the existence of a reservoir of atomic, indivisible Content units, call it the “Encyclopedia”. While there certainly must be constraints on what may or may not be an atomic Content unit, and while “atomic” from the perspective of some listing principle may itself have relevant conceptual subparts, I assume that such constraints and such decomposition, if warranted, do not come from the grammar as such, but rather are facets of the form in which concepts and world knowledge are cognitively organized. Interfacing between the Encyclopedia and linguistic representation is our search engine which is capable of recognizing phonologically realized linguistic strings of a particular size and matching them with individual Content units. A successful single encyclopedic search—“en-search”—thus returns a single atomic Content unit for a particular linguistic domain. We note
now that from this perspective, the term “non-compositional” is but another name for an “atomic Content unit”. Insofar as e.g. *transformation* in its linguistic technical sense has Content that cannot be predictable from its parts, it is as much an atomic Content unit as *cat*. Insofar as *transformation* in its compositional sense does have a predictable relation with its parts, it is not, as a constituent, a single atomic Content unit, although, of course, *transform* in all likelihood is. In computing the meaning of compositional *transformation*, then, a single en-search could return a Content for *transformation*, which could be composed with whatever function may be associated with -ation, itself a spellout of C_{N[V]}, to give rise to the composed interpretation of *transformation*. Importantly, the assignment of Content to */n*transformation/* as technical, atomic *TRANSFORMATION* is never mediated by a stage in which its subpart, */n*transform/* comes to be associated with *TRANSFORM*, and as a consequence that Content need not be overridden in any way. In this very specific sense, then, roots do not have inherent “basic” Content, and all atomic Content, of complex as well as of simple constituents, becomes available simultaneously and is accessed through the en-searching engine. We note that insofar as en-searching is a device matching linguistic representations with Content, it neither adds nor subtracts Content nor is it capable of affecting linguistic representations or derivations. It is, rather, an “interface”, capable of converting the terms of one system, linguistic representation of a particular nature, to the terms of the other system—Content units.\(^1\)

This chapter attempts to make the assignment of Content more explicit. Section 9.2 outlines some general considerations that must enter any attempt to delineate the domain of Content, and specifically, the extent to which it interacts with both spellout and syntactic structure. Some specific domains for Content matching, otherwise rather plausible, are investigated and found lacking.

In section 9.3, I turn to the proposal to be advanced in this work, according to which the domain of Content is to be defined in terms of the C-core and the ExP-segments dominating it. It is in that context that I show that some fundamental puzzles can find a natural solution. Section 9.4 is devoted to investigating the interaction between Content and spellout, and it is in that section that I argue that Content matching is specifically sensitive to the phonological representation of C-functors, or, in the terminology of Distributed Morphology, to Vocabulary Insertion. It is that final section that lays the foundation for the discussion of phase-based execution, to be articulated in Chapter 10. The appendix reviews in some detail the reasons for distinguishing between the matching of Content with (complex) words and the matching of Content with phrasal idioms.

While the questions under consideration in this and the next chapter are very general in nature, it is the properties of derived nominals, already analyzed in some detail, that will serve to make the investigation specific and empirically consequential. The remainder of this section is thus devoted specifically to outlining two puzzles that emerge from the contrastive behavior of R-nominals and AS-nominals. It is in the context of these puzzles that subsequent theoretical proposals will be evaluated.

\(^1\) By way of a notational refresher, capital italics (*TRANSFORMATION*) are in reference to Content. Non-italicized capitals are in reference to rigid designations.
9.1.2 R-nominals and AS-nominals—a brief recap

I have established in Part I of this work that a constrained syntax for derived nominals which have an event interpretation—AS-nominals—is indeed available. Specifically, I suggested that nominalization in such cases takes place above the event structure functional complex, and that the syntactic properties of such nominals can be shown to follow fully from that assumption, thereby requiring no extra statements about the properties of nouns in general or the properties of event structure when embedded within nominals. In turn the existence of a constrained syntax for AS-nominals, especially in conjunction with the complexity of their internal structure, strongly supports the claim that the phonological units we call “words” do not have a privileged syntactic status, and are but constituents which happen to be part of a single domain of phonological rule application, P-RaDs.2

Some space was devoted in Chapters 2 and 3 of Part I as well as in Chapter 7 (see examples (8)–(11) and related discussion) to reviewing the structural differences between AS-nominals, those which do have an event structure, and R-nominals, which do not. Specifically, and focusing on the nominal head of the derived nominal, consider again the structures in (1)–(4) (irrelevant structural details omitted), and with $CN[V]$ in reference to a nominalizer which is semantically otherwise vacuous, and with, in English, may spellout as /_nation, anc(y), enc(y), al, ment/ (the ATK class):

(1) a. the government of the people (by the people)

\[
CN[V] \\
[CN[V]]_E \langle[CN[V]]_E \langle CN[V] \rangle_{[C=V^πGOVERN]} \rangle_{[C=V^πGOVERN]}\]

b. (the) government (is imperfect)

\[
CN[V] \\\n[CN[V]]_E \langle[CN[V]]_E \langle CN[V] \rangle_{[C=V^πGOVERN]} \rangle_{[C=V^πGOVERN]}\]

2 As I will show in Chapter 12, the complexity of AS-nominals compares in surprising and non-trivial ways to the absence of such complexity in Synthetic Compounds.
The differing structures of AS-nominals and R-nominals, recall, correlate directly with the availability of event structure for the former, but not for the latter. As I also argued in detail (see Chapters 4 and 5) the relevant dividing line does not differentiate C\_u[v] (or ATK) nominals from ING nominals, as both may be AS-nominals as well as R-nominals. Rather, the crucial distinction is between derived nominals with an embedded argument structure complex, and those nominals which may include an embedded verb, however otherwise categorized, but which do not contain an argument structure complex.

Nor are de-verbal nominals unique in this respect. Properties of de-adjectival nominals were discussed in Chapters 4 and 5, where following Roy (2009) they were shown to exhibit similar properties, likewise associated with the presence of an event complex, and not with the choice of affixes. In turn, it is precisely the correlation between the internal structure of the derived nominals heading AS-nominals or S-nominals (in the sense of Roy 2009) on the one hand, and R-nominals or Q-nominals on the other hand, that provides strong support for the claim that what may very well be a single, identical domain for the application of phonological rules (P-RaD) (e.g. /\_government/) may nonetheless turn out to correspond to extremely different syntactic configurations, thereby rendering essential the syntactic representation of “word internal” structure.

Before we proceed, it is worthwhile to ponder, briefly, the coherence of the class of nominals that we have been labeling thus far “R-nominals”. The comparison with AS-nominals might be illustrative here, insofar as we may characterize this, fairly exhaustively, as in (5):
AS-nominal/S-nominal:

i. is headed by an expression morpho-phonologically derived from a verb or an adjective;
ii. and contains an event structure functional complex (including an event argument).

By contrast, R-nominals, as we have been using the terms thus far, are not as easy to characterize. Thus consider the following list of properties:

R-nominals:

a. are derived from verbs or adjectives as are AS-nominals and S-nominals
b. may have a result reading as may underived nouns or nouns derived from other nouns (e.g. crisis, accident)
c. may have a state reading as do underived nouns or nouns derived from other nouns (e.g. order, disorder, friendship)
d. may have a (simple) event reading as do underived nouns or nouns derived from other nouns (e.g. class, match, rivalry)
e. may refer to an object as do underived nouns or nouns derived from other nouns (e.g. table, tabletop, neighborhood).

Indeed, a perusal of Grimshaw’s original classification finds, in conjunction with R-nominals, primarily negative criteria. The reason is clear enough—her main purpose is to argue that seemingly identical nominals nonetheless have very distinct interpretations. Insofar as the main focus is on the event properties of AS-nominals, R-nominals, so called, become the minimal contrastive comparison set. From a broader perspective, however, it emerges that the grammar does not in actuality single out, interpretationally, nominals which may very well be derived, but which do not have a functional complex embedded within them. Differently put, the array of interpretational properties associated with R-nominals is precisely that expected from any object merging at the bottom of a nominal Extended Projection. Insofar as some R-nominals can be characterized more narrowly, such narrow characterization must be associated with the presence of a C-functor with a semantic function (e.g. ING, ER—as already discussed in Chapter 4, and see Chapter 12 for further discussion). Barring such semantically active C-functors, R-nominals can only be characterized through the absence of precisely those properties that render AS-nominals better defined.

Below, I turn to some significant differences between AS-nominals and (so-called) R-nominals, which, at the very least, will lend strong support to a very distinct grammatical treatment for AS-nominals and non-AS-nominals, including R-nominals. Beyond that, it will also lend considerable support to postulation of a formal distinction between C-functors and S-functors, with the latter as range assignors to ExP-segments. Specifically, what is under investigation in this chapter are cases where the presence vs. absence of ExP-segments is at the core of a formally distinct configuration, bearing in mind that such segments are embedded within AS-nominals but not within R-nominals.
9.1.3 R-nominals vs. AS-nominals—Content compositionality

Derived nominals frequently have non-compositional Content. However, this is never the case when they head AS-nominals (see also Marantz 2001). Rather, the head of the AS-nominal always has a compositional Content, directly computable from the Content of the verb/adjective, the interpretation of the argument structure within which it is, by assumption, embedded, and the properties of the nominalizer. Differently put, derived nominals with non-compositional Content are never associated with argument/event structure. To illustrate, consider the minimal pairs in (7)–(12) (non-compositional terms capitalized and italicized):

(7) a. *the linguist’s TRANSFORMATION of the structure (cannot be in reference to the linguist’s having performed a grammatical transformation on the structure)
   b. the linguist’s transformation of the field

(8) a. *the PROHIBITION (of alcohol sales) (by the US government) for fourteen years (cannot be in reference the period covered by the 18th amendment to the US constitution and repealed by the 21st)
   b. the prohibition of liquor sales during PROHIBITION

(9) a. *the CONSTITUTION of the US by the Founding Fathers (in Philadelphia)
   b. the constitution of the committee by the government (in Philadelphia)

(10) a. *the patient’s TRÁNSFERENCE of her feelings to her analyst3 (cannot mean: the patient engaged in TRÁNSFERENCE as psychoanalytically defined)
   b. the patient’s transférence/transferal of her files to a new doctor

(11) a. Debut author Matt Norman has “the MAKING of a powerful voice in fiction” (G)
   b. *The MAKING of a powerful voice in fiction by Matt Norman
   c. *Norman has [the MAKING of a powerful voice in fiction in five years]
   d. The making of an effective propaganda film in three weeks will further our case considerably

(12) a. *the READING of the world by Aristotle
   b. Aristotlé’s reading of the world (*for several decades)
   c. the interpretation/understanding of the world by Aristotle
   d. the reading of the test material by the students

[12a] with the non-compositional Content for reading provides a nice minimal pair not only with the fully compositional AS-nominal in (12d), but also with the licit (12b), under an authorship/free possession reading (on a par with e.g. Wagner’s Parsifal) and with the synonymous, but fully compositional licit cases in (12c).

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3 While occurrences of the verb transfer in English with a similar, psychological Content, do occur—as well as, marginally, transferal—these are summarily rejected, as it turns out, by psychoanalysts (*transfersal and counter-transfersal), who also insist specifically on the initial stress pattern in (10) as linked to the relevant term.
Similar effects are attested for de-adjectival nominals (see Chapter 5, section 3.1 for the relevant tests):

(13)  a. *the ongoing (General) RELATIVITY of this theory (cannot mean: this theory is constantly compatible with the General Theory of Relativity)
    b. *the earth with its ongoing GRAVITY vs. the financial crisis with its ongoing gravity
    c. *the UTILITY of my electrical system vs. the utility of my electrical system

Attempting an initial descriptive generalization, suppose we consider something like (14):

(14)  a. Non-compositional Content → no eventuality interpretation
    b. Eventuality interpretation → compositional Content

The generalizations in (14) as well as the contrasts in (7)–(13) seem intuitive enough, but in fact, for any theoretical perspective which assumes some listing of argument selection, however minimal and however executed, it is extremely surprising. In all the contrastive cases under consideration, the derivative pairs are put together from the same base/root with an identical suffix, and thus there is little about their morpho-phonology that could distinguish between them. Presumably, in any imaginable account, the jargon/non-compositional senses of TRANSFORMATION, CONSTITUTION, GRAVITY, and so on must be listed somewhere. It is not clear, however, why such listing should correspond to the inability to take arguments, or why the ability to take arguments should correspond to the impossibility of listing. The puzzle is further intensified by the fact that e.g. TRANSFORMATION, READING, and TRANSFERRENCE can be construed as simple events (cf. 15), and as such are certainly ontologically consistent with the existence of participants.

(15)  a. The passive TRANSFORMATION supposedly occurs in transitive configurations, and is triggered by a feature.

---

4 Nor is the effect necessarily restricted to derived nominals. Similar effects are certainly attested with de-verbal adjectives such as -able and -ive, or with de-nominal adjectives such as -al. Thus all cases in (i) are compatible with an eventive interpretation as well as with an R, non-compositional Content:

(i)  a. detestable; perceptible; debatable; divisible
    b. progressive; restrictive; inquisitive; digestive
    c. operational (tumor); relational; informational

As a full set of diagnostics that could distinguish AS-adjectives from other adjectives has yet to be developed, however, (and note that the matter is tricky insofar as predicational adjectives across the board, are associated with an eventuality), and for that reason the matter is largely set aside here. See van Hout and Roep (1999) and Roep and van Hout (2009) for an extensive discussion of the AS-properties of -ability and hence -able, by extension. See Kratzer (2000, 2004) on the potentially ambiguous internal structure of at least some adjectival expressions between phrasal and non-phrasal, affording the potential for the former, but not the latter, to be AS-ABLE cases.

5 In fact, the absence of event structure for non-compositional derived nominals which do not at all have a (simple) event reading, such as TRANSMISSION or BUILDING, is not in itself surprising. Rather, it is cases of derived nominals which are non-compositional but still do have a (simple) event reading that are puzzling. A deliberate attempt was thus made to focus on such cases where possible.
b. TRÁNSFERENCE typically occurs/takes place[starts] about 3–6 months after the beginning of analysis and may last up to 2 years if not properly controlled.
c. That READING of society has emerged as a result of my personal experience.

Furthermore, an event can certainly be construed involving the very same set of potential participants as would have been available for such nominals, were they grammatically licit as AS-nominals. Frequently, the roles associated with such participants are the very same as are otherwise associated with the compositional AS-nominal, as is evident from the cases in (16), where non-compositional nominals are embedded under light verbs, thereby making argument structure and event structure possible:

(16) a. The linguist performed a TRANSFORMATION on the structure.
b. The patient is undergoing TRÁNSFERENCE.
c. The READING of the world cannot be the READING made by academicians (G).

(16c), a corpus case, is rather illuminating, insofar as the rather tortured expression emerges directly from the need to accommodate a by-phrase, otherwise not licit directly with READING.

To appreciate just how theoretically surprising these effects are, it is worthwhile noting that to the best of my knowledge, there are no generative models which actually subscribe to anything like the generalizations in (14), nor could the correlations in (14) possibly be true for any model that subscribes to listed argument selection of any sort, be it a categorically specified one (arguments selected by listed verbs, adjectives, possibly nouns, as in most standard lexicalist approaches), a categorically underspecified one (e.g. Chomsky 1970), or a root-based one (e.g. Marantz 1997 and subsequent notes). Quite to the contrary, a positive relationship between listedness, i.e. non-compositionality, and argument selection is the cornerstone of such accounts. Thus insofar Content of underived forms clearly must be listed somewhere, within systems that list argument selection, the availability of such listed argument selection in conjunction with listed Content is inevitable. The same would hold in such approaches for possibly complex, but nonetheless non-compositional verbs such as e.g. patron-ize (with its CONDESCEND Content) or suffoc-ate where, likewise, argument selection would need to be listed insofar as it certainly cannot be associated with either patron or suffoc. From such perspectives on listedness, then, (14), as such, is not expected to be valid, rendering entirely obscure the obligatory absence of arguments for non-compositional derived nominals as well as the obligatory compositionality of AS-nominals.6

6 While the non-compositional form at times exhibits phonological reduction or stress change, such changes are neither necessary nor sufficient to indicate non-compositional Content. To wit, there are no phonological differences between TRANSFORM-ation and TRANSFORMATION, and insofar as there are stress differences between TRÁNSFERENCE and TRANSFÉR-ence, it is in fact the latter, compositional case that exhibits stress shift rather than the former. I return to this matter in greater length in section 9.2.2 as well as Chapter 10.
Suppose we consider more concretely the executional difficulties that would be involved in attempting to incorporate (14) into a host of classical, broadly accepted approaches to listing, to argument structure, and to derived nominals, starting with the original lexicalist view of nominals developed in Chomsky (1970). To account for the identical complementation possibilities for (some) derived nominals and their source verbs, Chomsky suggests the existence of entries which are categorically underspecified but which do have insertion frames, and which could be contextually nominalized or verbalized.\(^7\) For the pair \textit{transform-V} and \textit{transformation-N}, then, there would be a single entry, call it \textit{TRANSFORM}, specifying insertion in the context of an NP complement, and which would be instantiated as /\textit{transformation}/ in a nominal context, and as /\textit{transform}/ in verbal contexts. That derived nominals, but not verbs, can occur without a direct object, on the other hand, follows from general constraints on categorial syntax, and specifically, the optionality of arguments in nominal contexts which, it would appear, may prevail over the insertion frame.

Within such a system, the requirement that the non-compositional entry \textit{TRANSFORMATION} occur without arguments is not much of a problem. The more difficult question, however, is how to \textit{prevent} it from occurring with arguments. The only way to accomplish this, it would seem, would be to ban it altogether from the \textit{TRANSFORM} entry, and have it constitute a distinct entry, call it \textit{TRANSFORMing} which, in turn, is intransitive. That would ensure that \textit{TRANSFORMing} would not share the insertion frame of \textit{TRANSFORM}. The move, however, presents its own host of formal complications.\(^8\) Not the least of these involves the fact that such “banning” would not actually suffice to block, in principle, all such newly drifted listed entries from having argument

\(^{7}\) In accordance with the framework used, a unified underspecified entry would come with an insertion frame, or subcategorization, rather than argument selection as such, first introduced, in a lexical context, by Bresnan (1978) and Chomsky (1981).

Crucially, and contra Marantz’s (1997) interpretation, Chomsky (1970) does not assume that those entries are roots in any conventional sense, insofar as there is no suggestion that e.g. \textit{verbalize} has different properties from \textit{formation} or, for that matter, \textit{grow/th}. The most natural interpretation of the Chomsky system would have an unspecified entry \textit{VERBALIZE} or \textit{GROW} which would spell out as \textit{verbalize} or \textit{grow} in some contexts, and as \textit{verbalization} or \textit{growth} in others, and with the internal structure of \textit{verbalize}, if indeed it has any in that system, orthogonal to such listing. The matter is central, as Chomsky (1970) explicitly (and assertively) does not consider morphological complexity to be a syntactically relevant issue. For differences between this system and the categorization system assumed here, see detailed discussion in section 2 of Chapter 7.

\(^{8}\) Complicating conceptual issues emerge as well, not the least of which is the question of what is, and what isn’t, a unified lexical entry, and what grounds are for excluding any polysemes or homophones from sharing it. It raises a number of model internal questions as well. Non-compositionality within the derived nominal domain is one of the key issues Chomsky puts forward in deciding to relegate the derivation of nominals to a lexical component. But if \textit{TRANSFORMing} and \textit{TRANSFORM} do not share an entry, and nor do, by the same logic, \textit{PROOF}math and \textit{PROOF}edit and other cases, then the relationship between those pairs is not any more meaningful than that which holds between e.g. \textit{BANK}\textit{shore} and \textit{BANK}\textit{finance}, a conclusion that appears rather unsatisfactory, if our aim is to account for the manner in which complex words may, or may not, be related to each other or to their subparts. Even more importantly, from the viewpoint of Chomsky (1970), is the fact that if e.g. \textit{PROOF}math and \textit{PROOF}edit do not share an entry, their failure to have any properties in common could no longer bear on the lexical or syntactic status of the predictable relationship between the verbal and the nominal instantiations of \textit{PROOF}math thereby eliminating the original reason to ban the relationship between \textit{PROVE} and \textit{PROOF}math from the syntax.
structure, and thus insofar as such listed entries never have argument structure, this
would have to be independently stipulated. Nor could we derive from such double
listing the fact that \textsc{transform}\textsuperscript{ling} has no correlating verbal instantiation. To capture
this latter fact, one would need to state that \textsc{transform}\textsuperscript{ling} (but not \textsc{transform}) is
always N. But then, we would need to augment the system with the statement that if
(and only if) an N entry does not have a verbal instantiation with an identical Content,
it may not have arguments. Note that the identity of Content as well as the absence of
a V correlate are crucial. Thus the entry \textsc{patronize} with its non-compositional
Content (=\textsc{condescend}) could be successfully banned from the entry of its compos-
tional twin (\textit{patronize} as in ‘become a patron of’), but in that case, its N instantiation,
\textsc{patronizing} in the sense of \textsc{condescending}, is possible as an AS-Nominal.

But if such an execution is adopted, and if it were indeed the case that nouns that do
not have a verbal correlate couldn’t assign arguments, that would boil down to the tacit
claim that only verbs may have arguments, and that, for all intents and purposes,
argument-taking nominals inherit their arguments from verbs, whereby substantially
undermining the claim that e.g. \textit{form} and \textit{formation} are but phonologically distinct
instantiations of the same underspecified entry.\footnote{In turn, to be workable, any inheritance account would need to subscribe to some relatively concrete
notion of phonological faithfulness (see Chapter 8 for extensive discussion), or risk a considerable loss of
explanatory power. Thus, without phonological faithfulness, there is little to prevent one from postulating
an unspecified lexical entry, call it \textsc{transform}\textsuperscript{ling-prime}, with argument structure listing, and a verbal
as well as a nominal instantiation, but augmented by the assumption that the verbal phonological
instantiation is “frozen” (in the sense of Reinhart 2002). But if such relaxation of the system is allowed,
any claim concerning derivational relations becomes, effectively, non-falsifiable.}
Furthermore, even under such a “banning” and labeling execution, matters are not entirely straightforward. Morpho-
phonologically, /\textsc{transformation}/ is derived from /\textsc{transform}/, and its morpho-
phonological properties are entirely predictable from this derivational process. Relegat-
ing \textit{transformation} to an entry entirely unrelated to /\textsc{transform}/ would thus amount to
deny the claim that any morpho-phonologically relatedness can be brought to bear on
the issue of the derivational relationship between these two, and by extension, between
any two words. For otherwise, it is hard to see how an entry such as \textsc{transfor-
mation}\textsuperscript{ling} could be effectively prevented from inheriting the listed arguments of the entry
\textsc{transform}, from which it is at least morpho-phonologically derived, but not so
\textsc{transform-ation}. The only other conceivable alternative, or so it would seem, would
be a brute force one, i.e., stipulating that for some reason, argument-less nominal
instantiations may drift, but not so argumental ones.\footnote{In turn, this type of stipulation does away with the claim that argument structure is optional in
nominals, insofar as it appeals to an in-principle distinction between nominals that take arguments and
nominals that do not.

The generalization is even trickier to state in lexicalist accounts which do not assume inheritance, e.g.
Grimshaw (1990) or more recently Newmeyer (2009). In Grimshaw’s system, the argument structure of derived
nominals emerges from the assignment of Ev as an external argument in the context of some nominalizing
affixes. It is hard to see, however, why in such an account \textit{transformation} can assign Ev and select arguments, but
only with a Content equivalent to the \textit{act of transforming}, and not the \textit{act of performing a (grammatical)
transformation}. Newmeyer (2009), finally, subscribes to the view that the availability of arguments in nominals
is an altogether arbitrary affair, related neither to their derivational history nor to the properties of nominalizers,
thereby making any generalization along the lines of (14) in principle impossible to state.

\footnote{In turn, to be workable, any inheritance account would need to subscribe to some relatively concrete
notion of phonological faithfulness (see Chapter 8 for extensive discussion), or risk a considerable loss of
explanatory power. Thus, without phonological faithfulness, there is little to prevent one from postulating
an unspecified lexical entry, call it \textsc{transform}\textsuperscript{ling-prime}, with argument structure listing, and a verbal
as well as a nominal instantiation, but augmented by the assumption that the verbal phonological
instantiation is “frozen” (in the sense of Reinhart 2002). But if such relaxation of the system is allowed,
any claim concerning derivational relations becomes, effectively, non-falsifiable.}
The problem likewise plagues non-lexicalist models that postulate an internal argument for roots, or alternatively models which divide root stock into *stative* and *eventive* types (see Chapter 8, section 3 for discussion), with the latter giving rise (presumably optionally) to an event reading and arguments with either a nominal or a verbal instantiation, but not so the former. Under such accounts e.g. *transformation* takes an argument (directly) because √TRANSFORM, by assumption, is an *eventive* root (cf. 17). To complete the picture, recall that at least in principle, the assumed internal argument may either merge directly with the root as in (17a) (cf. Harley 2009a, b; also Embick 2004), or it could merge with n, as in (17b) (cf. Embick 2004; Marantz 2005, i.a.), or, for that matter, with an even higher functional structure:11

It is not clear, however, how to account for the ungrammaticality of (7a) under either one of these structures. Under the execution in (17a), non-compositional Content, if assigned at the n cycle as assumed by Arad (2003) or Embick and Marantz (2008), would target, presumably, either circled constituent. If the lower (adjunction-domain) n_{ation} is the relevant domain for Content, it is difficult to see how the presence or absence of a sister to the root should affect the availability of Content assignment to the circled constituent, and specifically, why, if the inner n_{ation} is non-compositional, a sister DP would be blocked. If, on the other hand, Content is assigned to the higher instantiation of n_{ation} in (17a), we would expect non-compositional content to affect the root-argument constituent as a whole, making it effectively an idiom. Quite apart from the empirically limiting consequences of such a result, we note that it would not exclude an argument as such, and at most, would exclude a compositional relationship between the root and its argument.

Turning to (17b), it presumably requires some sort of percolation, or inheritance, as the argument does not merge with the root which, by assumption, selects it, and in fact, does not merge with any head, but rather with some non-minimal projection of n. If we assume that non-compositional Content is assigned at the minimal n level, presumably to the circled constituent, the account would need to be augmented by the claim that non-compositional Content blocks inheritance from the root, by no means an obvious move, and one already critiqued directly above in the context of similar assumptions within a lexicalist framework. Even more seriously, any such claim is fundamentally committed to the view that both Content and argument selection must be associated with roots, but may be overridden at categorization level.12 For otherwise, it is hard to see how the distinction between

11 The remarkable similarities between the problems facing a lexicalist approach and those facing syntactic models which allow roots, albeit non-categorized, to select an argument or to be divided into *eventive* and *stative* types, raises a legitimate question concerning the possibility that they are, in actual fact, considerably less distinct than might appear. See Chapter 8, section 3 for some relevant discussion.

12 Arad (2003, 2005) remains quite equivocal as to whether roots are actually associated with independent Content which is then pre-empted at first categorization. See section 9.2.2 for a more detailed review.
compositional and non-compositional could be made at the circled level so as to allow inheritance in the compositional cases, but block it for non-compositional cases. Differently put, the term “inheritance” presupposes the existence of properties to inherit, which in this case must be those of the root, and which perforce must involve not only argument selection, but also Content. The problem, we note, does not disappear if one assumes that eventive roots do not themselves have internal arguments, but license or select the merger of superordinate functional event structure that licenses such arguments. Insofar as there is some relationship of percolation or selection between the eventive root and whatever structure may dominate it, which enforces, or licenses, the merger of arguments, it is not clear why non-compositionality should block such a relationship in the presence of an identical root (e.g. √TRANSFORM). All the more so as TRANSFORMATION ling, as already noted, may denote a simple event.

We note, relative to both executions in (17), that they predict possible non-compositionality, specifically, for unaccusative AS-nominals. In other words, the prediction is that there should exist, e.g. in English, expressions which are equivalent to those in (18), but in which the derived nominal has a non-compositional Content. Depending on the specifics of the execution, and e.g. the role of verbal suffixation, the prediction might also be that while the cases in (18) could be non-compositional, this wouldn’t be the case for those in (19). I am aware of no cases of such non-compositionality, nor is there any evidence for a difference, in this respect, between nominalized derived verbs, as in (19), and nominalized “roots” as in 18.13

(18) a. the arrival of the train  
    b. the collapse of the wall  
    c. the eruption of the fire

(19) a. the crystallization of the ice  
    b. the unification of the workers

Viewed more broadly, the difficulties just outlined in excluding all the (a) versions of (7)–(13) and deriving the generalizations in (14) all emerge from attempting to find a way to prevent the argument-structure properties of listed items, be they verbs, nouns, or roots, from being instantiated in some contexts while allowing them in others. Consider, however, the opposite approach. Specifically, suppose what is in need of characterization is not the obligatory exclusion of arguments in some contexts, but rather their availability. In fact, if one subscribes to the view that listed items, whatever they might be, never specify arguments or argument structure, nor have meaning that licenses or fails to license event structure, then what is in need of explanation is not the absence of arguments for the non-compositional (a) versions of (7)–(13), or, for that matter, for the potential absence of non-arguments for perfectly compositional R-nominals. Rather, what is in need of explanation is the presence of arguments in AS-nominals. Once viewed this way, the answer to the puzzle presented by the correlations in (14) becomes intuitively rather clear. It is precisely the presence of arguments—and more specifically, the presence of syntactic

13 Recall that Short nominals, with unrealized subjects, are the result of passive. It therefore follows that unaccusative AS-nominals must involve a realized argument, and that e.g. the collapse cannot be an AS-nominal.
structure which licenses arguments and event structure—that forces a derived form to remain “honest”. If, as argued extensively in Chapters 2–5, the emergence of event structure is only possible through the existence of functional event structure, then the conclusion must be that it is precisely that full functional event complex that not only licenses the presence of arguments but which blocks the derived nominal from receiving non-compositional Content. On the other hand when no such functional complex is present and the derived nominal consists solely of a verb (or a verbalized root) and a nominalizer, non-compositional Content may (but need not) emerge. The simplest, most direct way to state this generalization thus must refer to syntactic structure: in AS-nominals, the relationship between the nominalizer and the stem is mediated through a functional event complex. In R-nominals, however, no such intermediate functional structure exists. The availability of non-compositionality clearly must be derived from that.

Before I turn to a detailed execution of this suggestion, however, a number of other important differences between AS-nominals and R-nominals are in need of discussion.

9.1.4 AS-nominals vs. R-nominals: morpho-phonological considerations

The system of categorization put forward in Chapter 7, recall, specifically renders an otherwise category-less root categorially equivalent to the Categorial Complement Space (CCS) defined by the C-functor with which it merges. From that perspective, and as already noted in both Chapter 6 and Chapter 7, the root that merges with $C_{N[V]}$ is definitionally V-equivalent. It thereby emerges that in the derived nominals in (20), the complement of $C_{N[V]}$, regardless of the latter’s phonological instantiation, is V-equivalent:

\[\]

\[\]

\[\]

\[\]

\[\]

\[\]

In contrast with the bulk of the cases discussed thus far, in the forms in (20), the base that merges with the suffix does not make up an independent word in English, nor is its category self-evident. These, as already noted, are precisely the cases which have given rise to the proposal, originally in Aronoff (1976), that morphology be divided into a productive part and an analytic part. The analytic part, effectively, consists of using productive rules of word formation to parse a complex form which is listed, but which no longer represents an actively derivable structure. The representations for e.g. empowerment and globalization are thus as in (21a), while (21b) gives the representations for a sample from (20), and with a categorized, but otherwise not independently attested form (presumably a root) underlined:

\[\]

14 Cases such as question or proposition which occur as both nouns and as verbs, are excluded from the discussion. See Chapter 7, section 4.4 for a detailed discussion and for the proposal that these have been reanalyzed as roots. This clearly is not the case for the nouns in (20).

Recall that I assume that whatever relationship holds between ance/ence nominals and ant/ent adjectives does not consist of deriving the former from the latter (i.e. ance/ence are not realizations of $C_{N[A]}$, but rather realizations of $C_{N[V]}$). Rather, the correlation is best analyzed, I believe, as an independent affixation of $C_{A[v]}$ and $C_{N[V]}$ to the same root (see fn. 41 of Chapter 7 and related discussion for some of the relevant issues). In turn, the realizational similarities may stem from some efficiency of realizational information, as listed with the root. Similar considerations may apply to IST/ISM; see fn. 37 for a brief discussion.
The affinity of the analytic categorizing system to the system of contextual categorization outlined in this work is clear. Insofar as all the suffixes in (20) are instantiations of \( ATK_{N[V]} \), their CCS is always V-equivalent. There is, nonetheless, one difference between the system outlined here and that presented in Aronoff (1976), as the status of e.g. \( nat \) in (21b) in the system outlined here is not in actuality any different from that of e.g. \( form \) in cases such as \( formation \) (cf. 21c). Specifically, Aronoff does assume categorial listedness for attested forms, and insofar as \( form \) is attested as a verb, analytical categorization is not necessary. In the system presented here, \( form \) is a category-less root, and is hence, by assumption, categorized by its context just like \( nat \). Our dividing line, then, cuts between already categorized elements, the latter by assumption always themselves headed by C-functors, as in (21a), and the contextually (or analytically) defined equivalence classes (underlined) not only not in (21b), but in (21c) below as well, although, as we note, the underlined forms in (21c) do happen to correspond to attested independent verbs:

Focusing, first, on the roots in (21b), we note that while they may not be attested in isolation, they are not cran morphs—rather, they do occur elsewhere in the vocabulary of English, and some sort of loose conjecture may even suggest a basic Content, although it would be very difficult to argue that such Content is cognitively real. Thus, plausibly, \( ^x\sqrt{nat} \) as in \( nation \), occurs with a similar Content in \( nature, natal, \) and \( innate. \) More importantly, we find alongside \( ^x\sqrt{fict}+C_{N[V]} \) (\( fiction \)) and \( ^x\sqrt{nat}+C_{N[V]} \) (\( nation \), derivatives which likewise involve a suffix that (otherwise) has a verbal CCS, as is the case for \( C_{N[V]} \), such as \( fictive \) and \( native. \) These factors support the treatment of the forms in (20) as complex and derived, rather than as reanalyzed mono-morphemic simpletons. We also note that insofar as e.g. \( /p\sqrt{nat}/ \) or \( /p\sqrt{petul}/ \) may not occur as independent verbs, this is not in and of itself necessarily a problem. Rather, one might characterize them as bound roots, thereby attributing their absence in isolation to phonological factors which need not be syntactically relevant.

A closer investigation, nonetheless, reveals that a mere phonological characterization cannot possibly suffice, as there turns out to be a very real syntactic, non-phonological difference between e.g. \( formation \), by assumption with a verbalized \( ^x\sqrt{form} \), and \( nation \), with a likewise verbalized \( ^x\sqrt{nat} \). The former may be an AS-nominal. The latter absolutely may not be, as already briefly noted in Chapter 6, section 2.4. Rather, to the extent that it is legitimate to assume that the forms in (20) are derived, they must be R-nominals; this, we note, even when the nominal plausibly denotes simple events, as is the case with e.g. \( vision \) or \( aviation \) (in the presumed absence of \( aviate\))\textsuperscript{15}.

(22)  a. *the vision of the mountain by the instructors for three hours this morning  
b. *the aviation of the plane for three hours by the novice pilot

\textsuperscript{15} Some dictionaries list \textit{aviate} as a verb, and specifically as a back formation from \textit{aviation}. It is, however, absent from the lexicon of all native speakers that I consulted, who systematically also reject (22b).
But why should that be? Why are AS-nominals blocked? Specifically, why can’t the V-equivalent roots $[C=V^{\sqrt{\text{NAT}}}]$, $[C=V^{\sqrt{\text{RELECT}}}]$, or $[C=V^{\sqrt{\text{VIS}}}]$ be embedded in the (schematic) structure in (23a) (cf. 1), although they are perfectly licit in (23b)?

(23) a. $[^{\text{NP}}[C=V^{\sqrt{\text{VIS}}}]-C_{n[V]} \ [\text{EP} \ [\text{DP} \ \text{SUBJ}] \ [\text{ASP}_{q[v]} \ [\text{DP} \ \text{OBJ}]] \ /_{\pi \ \text{vision}}]$

b. $[^{\text{NP}}[C=V^{\sqrt{\text{VIS}}}] - C_{n[V]} \ [C=V^{\sqrt{\text{VIS}}}] \ /_{\pi \ \text{vision}}]$

While the absence of AS-nominal derivation for the forms in (20) is puzzling, we do note that it confirms a claim already made previously in this book (specifically in Chapter 2, section 2.1 and Chapter 6, section 2.4), according to which AS-nominals are only possible with a bona fide V constituent which is otherwise independently attested, thereby accounting for the absence of AS-nominal interpretation for underived (simple) event nominals such as class, concert, opera, etc. We therefore appear to have arrived at a rather counter-intuitive juncture, requiring us to somehow introduce into the system a coherent syntactic distinction between verbal constituents that may occur as free morphemes, and verbal constituents that may only occur as bound forms; at least at first sight a very unhappy situation, but as we shall see, in actual fact one that provides us with a rather deep insight into the specific way complex words must be modeled within the syntax.

9.1.5 The verb within AS-nominals, again

Because the claim turns out to have such surprising ramifications, it is worthwhile pausing briefly to reintroduce the motivation for the assertion that AS-nominals always contain an independently attested V constituent, as well as provide more substantial evidence for it. The contrasts in (24)–(25) were already introduced and discussed:

(24) a. the {class/lesson/course/seminar} took place at sunset and lasted 90 minutes
   b. the {class/lesson/course/seminar} (to the student) (*by the teacher) (*to explain the exam) (*in/for 90 minutes)

(25) a. the {instruction/supervision/guidance} took place at sunset and lasted 90 minutes
   b. the {instruction/supervision/guidance} (of the student) (by the teacher) (to explain the exam) (in/for 90 minutes)

By way of additional corroboration, consider now the contrast attested, in Modern Hebrew, between native and borrowed forms. Hebrew allows very freely and productively the borrowing of Latinate -ation-ending nominals, as illustrated in (26):\footnote{16 The earliest such borrowings appear to have come via Russian, which may account for the specific phonological form of the ending. Russian -cye modified to -cya to accommodate the native feminine nominal ending -a. All such borrowings are thus, predictably, feminine. Subsequent -ation borrowings from German and from English were incorporated into that pattern. The borrowing process is extremely productive and such Latinate forms are regularly used on the fly, especially in technical discussions, whenever a native term is either missing or harder to retrieve. To the best of my ability to ascertain, the}
(26) transformacya konstrukcyay derivacya administracya glorifikacya… transformation construction derivation administration glorification…

Alongside the borrowed nouns, Hebrew often has corresponding native nominals derived productively from verbs, and quite frequently with virtually identical Content to those of the borrowed forms. Particularly telling, in this respect are the corpus cases in (28) and (29), both from Hebrew Wikipedia, in which the native derived nominal actually repeats the borrowed nominal by way of emphasis and clarification:17

(27) a. ha.šinnui haya cafui / hitraxeš bīnāt 2000
   the.change/transformation was.m expected.m occurred in-year 2000
b. ha.transformacya hayta cfuyu / hitraxaša bīnāt 2000
   the.transformation was.f expected.f occurred in-year 2000

(28) gam ʔavodot ha.bayit hen produkcya, gam hen yiccur
    also works the.house are production also they production
    (borrowed) (native)

’Housework as well is production [borrowed], it’s also production [native].’

(29) histagglut evolucyonit o adaptacya hi ha.derek șe-b.a
    adaptation evolutionary or adaptation is.f the.way that-in.her
    (native) (borrowed)
organizmim mitmodedim ʔim qšayim be-sbibat ha.mixya
    organisms cope with difficulties in-environment the.living

’Evolutionary adaptation [native] or adaptation [borrowed] is the way in which organisms cope with difficulties in their living environment.’

Note now that the nominals in (27)–(29), native and borrowed, do not have an event structure, although they do name (simple) events (with the example in (27) specifically constructed to illustrate this point, and the examples in (28)–(29) corpus cases consistent with this interpretation). The native forms, we note, are thus R-nominals—nominals morphologically derived from verbs, but without the mediation of functional event structure. Suppose we now turn to the domain of AS-nominals. Virtual synonymy notwithstanding, what we find is that across the board the native derived nominal is licit as an AS-nominal, exhibiting the myriad of characteristics discussed already in detail in Chapter 3. Not so, however, the borrowed nominal, where none of the diagnostics of “complex events” are applicable—arguments, aspectual modification, (controlled) purpose clauses, and agentive “by”-phrases are all impossible:

(30) a. ha.šinnui șel merkaz ha.ʔir ʔal yedey ha.ʔiriya
    the.transformation/change of center the.city by the.municipality

only other productive case of suffixed borrowing is the -ist/ism pair. Cases such as strukoora or kultoora (’structure’, ’culture’) do exist but -are suffixed nominals (-oora) do not constitute a productive source for borrowing. -ment, -ity, -al, -age, and -ance are altogether absent.

17 Hebrew Wikipedia ’Marxist Feminism’ entry; ’Evolutionary Adaptation’ entry.
b. *ha.transformacya šel merkaz ha.?ir ?al yedey ha.?iriya
the.transformation of center the.city by the.municipality
‘the transformation of the city center by the municipality’

(31) a. ha.yiccur šel mexoniot yuqra be-?esrim ša?ot
the.production of cars prestige in-20 hours
kedey le.qadem ‘et ha.kalkala
in-order to advance the.economy

b. *ha.produkcyą šel mexoniyot yuqra be-?esrim ša?ot
the.production of cars prestige in-20 hours
kedey le.qadem ‘et ha.kalkala
in-order to advance the.economy

‘the production of luxury cars in 20 hours in order to advance the economy’

(32) a. ha.histagglut šel ha.neandertalim le-’aqlim Eropa tox 20,000 šanim
the.adaptation of the Neanderthals to-climate Europe in 20,000 years

b. *ha.’adaptacyą šel ha.neandertalim le-’aqlim Eropa tox 20,000 šanim
the.adaptation of the Neanderthals to-climate Europe in 20,000 year

‘the adaptation of the Neanderthals to the climate in Europe in 20,000 years’

The generalization here is as simple as it is inevitable. Without a source V,
AS-nominal reading is simply not possible. That is the direct reason for the ungram-
maticality of the AS-nominal in the (b) versions of (30)–(32). Equally strong, how-
ever, is the conclusion that a simple event reading as well as nominals devoid of
arguments may occur with or without the presence of an embedded V. That is the
precise reason for the synonymy of the native and borrowed R-nominals in (27)–(29).

That said, and as the astute reader no doubt noticed, a certain crucial link has
been skipped in the previous line of logic. Specifically, the claim that there is
no V constituent within forms such as English class or Hebrew borrowed produkcya
is not, a priori, identical to the claim that there is no phonologically realizable
V constituent within such forms. To make the point more explicit, within a model
of universally late phonological insertion for functors as well as for roots, and
as already discussed at some length in Chapter 8, section 2.1, there is nothing to
rule out a derivation such as (33b). Specifically, in the absence of phonological
information for some root √EAT, nothing can prevent it from spelling out differently
in isolation (or when embedded directly under T or v) from how it would spell out
when embedded, e.g., under CAUSE:18

(33) a. [√EAT ] → /n.eat/
b. [v CAUSE √EAT ] → /n-feed/

By the same logic, of course, there would be little reason, absent phonological
information for the root, to exclude the representation in (34c) under the assumption

18 Recall that √EAT, as a notation, is in reference to notions of roots that are not specifically equated with phonological indices. A reference to the root as a phonological index would be notated as √EAT.
that there exists a root √CLASS or some abstract lexeme CLASS which can be either phonologically realized as e.g. /πteach/ in verbal contexts, as in (34a) or alternatively, is altogether phonologically missing, or frozen, as in (34b) (cf. Reinhart 2002). A similar logic would yield the spellouts in (35) for the Hebrew borrowings:

\[(34)\] a. \[\text{T}_V \left[ C=V \text{CLASS} \right] \rightarrow /πteach/ \]

b. \[\text{T}_V \left[ C=V \text{CLASS} \right] \rightarrow /π0/ \]

c. \[\text{N}_V \left[ C=V \text{CLASS} \right] C_{N[V]} \] \[\rightarrow /πclass/ \]

\[(35)\] a. \[\text{T}_V \left[ C=V \text{CHANGE} \right] \rightarrow /πšinna/ \]

b. \[\text{N}_V \left[ C=V \text{CHANGE} \right] C_{N[V]} \] \[\rightarrow /πšinnui; /πtransformacya/ \]

Clearly, however, if the derivations in (34)–(35) are allowed to proceed as such, any hope of capturing the contrasts between class and teaching or between native and borrowed forms in Hebrew is lost. Any account of complex words, then, must adhere to some measure of phonological faithfulness, equating at least in some fashion the existence of a phonologically discernible constituent with a syntactic one.

It is worthwhile noting, in this context, that equating roots with phonological indices would directly exclude the spellouts in (34)–(35), under the assumption that phonological indices, in the intended sense, are precisely faithfulness-ensuring devices. If roots are indeed phonological indices, it follows directly that e.g. transformacya or produkcya cannot emerge from the structure in (35b) quite simply because there is no root, i.e. there is no phonological representation that can be embedded within transformacya or produkcya which could be otherwise characterized as the relevant V-equivalent portion, nor is there a C-functor which could be assumed to attach to such a root so as to render it V-equivalent. Nonetheless, phonological faithfulness as enforced through the view of roots as phonological indices may be necessary, but it cannot be sufficient. Specifically, it clearly does not suffice to rule out the AS-nominal instantiation of the forms in (20). In reference, again, to the structures in (23), what seems to be missing is the need to specify that e.g. /πvis/ is a perfectly licit spellout for the V-equivalent constituent in (23b), but for some reason, not so for the V-equivalent constituent in (23a).

Suppose we attempt at this point a joint statement concerning the two grammatical differences we have observed between AS-nominals and R-nominals. We noted that AS-nominals must be compositional, and we noted that the V embedded within AS-nominals must be independently phonologically realizable. On the other hand, R-nominals need not be compositional and the V embedded within them need not be independently phonologically realizable. The structural difference between AS-nominals and R-nominals, we note, concerns the existence in the former, but not in the latter, of functional event structure. I already suggested that it is the presence of that functional event structure that is implicated in the absence of non-compositional Content for AS-nominals. Suppose, then, we assume that the very same factor is implicated in accounting for the phonological effects just discussed which differentiate AS-nominals, from R-nominals. If so, the emerging generalizations would be as in (36), and with “stand-alone” clearly in need of clarification:
9.2 Domains of Content, Domains of Spellout

9.2.1 Preliminaries

Non-compositional Content, to the extent that it is associated with linguistic units, must be listed. The attempt to return the derivation of complex words to the syntax cannot consist of the denial that such listing is necessary. Rather, within a syntactic approach, the task is to delimit and constrain the syntactic domain within which such listing can be consulted. In turn, if roots, as such, do not have Content and are altogether not a syntactic object, then the smallest possible unit with which listed Content may be matched must be some minimal syntactic C-constituent, whether categorized or a category-equivalent. In the following sections I will embark upon a general discussion of Content matching to derivatives, including compounds.

While the existence of non-compositional Content for “words” is unquestionable, so I believe, is, the fundamental difference between such non-compositionality in the domain of “words” and the non-compositionality which may be attested for larger, phrasal idiomatic expressions. The essence of the difference consists in the assumption that there is a difference between the matching of non-compositional Content with a constituent as a result of a single encyclopedic search, en-search, and non-compositional Content that may emerge in a discontinuous, broader syntactic context and which, as such, requires more than a single search and is subject to distinct constraints. Focusing now, specifically, on Content matching through a single en-search, we note that, however formulated, such Content matching is sensitive to the distinction between what we may loosely refer to as “free-standing” forms and “bound” ones, where by “free” I refer specifically to forms which (in a given derivation) are coextensive with the (maximal) C-core, insofar as they do not merge with any C-functors. To illustrate the point, consider the first stanza of Lewis Carroll’s Jabberwocky, as contrasted with some hypothetical Contentful correlation. What is under consideration, specifically, is the proper linguistic characterization of the boldface elements in (37a, b):

(37)  a. ‘Twas brillig, and the slithy toves Did gyre and gimble in the wabe: All mim(s) y were the borogoves, And the mome raths outgrabe.  
       b. ‘Twas twilight, and the sturdy/flimsy doves Did splash and paddle in the lake: All bloody/flakey/bulgy were the water groves, And the bullfrogs did the shake.

And see appendix on the fundamental distinction assumed here between non-compositionality in “words” and non-compositionality in phrasal idioms.
Suppose now we consider all /sy/-ending forms (as well as potentially /sy/-ending ones) as possible realizations of $C_{A[N]}$. The relevant forms in (37a, b) now cluster into four categories:

(38)  a. slithy, mimsy
     b. sturdy, flimsy
     c. bloody, flakey
     d. bulgy, bossy

That the forms in (38a) are altogether devoid of listed Content indicates that Content assignment, as such, is not obligatory. A linguistic computation without a paired Content is certainly not the normal state of affairs, but it is beyond doubt that the human linguistic capacity is capable of generating such configurations. Consider, however, the Contentful forms in (38b–d). These differ along the following lines: in (38b), the base to which /s(y)/ attaches is otherwise not independently available for Content matching in English. In (38c) Content is available for the base, but the Content that is assigned to the derivative need not be composed of that Content. Finally, in (38d), Content is available for the base and the Content of the derivative is fully composed from it:

(39)  a. slith, mim(s) No Content on file slithy, mimsy No Content on file
     b. sturd, fлим(s) No Content on file sturdy, flimsy STURDY, FLIMSY
     c. blood, flake BLOOD, FLAKE bloody, flakey BLOODY, FLAKEY
     d. bulge, boss BULGE, BOSS bulgy, bossy BULGE+C_{A[N]};
                     BOSS+C_{A[N]}

The picture in itself is hardly new (although nonetheless far from trivial). What is worth highlighting, however, is the fact that Content for the base may be missing altogether or overridden, as in (39a–c) but Content may nonetheless emerge from matching with the entire expression, and hence STURDY or BLOODY. It thus emerges that even if a “bound” base (i.e. one that merges with a C-functor) fails to be assigned Content, either because such Content does not exist on file (e.g. *STURD) or because of a simple failure to match it (e.g. BLOOD), it gets, so to speak, another chance, in combination with the C-functor that it merges with. Not so, however, “free” forms, i.e. forms which are coextensive with the (maximal) C-core, whether themselves complex or not. In contrast with e.g. /sturd/ and /blood/, which do enter some Content matching, albeit not in isolation, the forms in (40) are doomed to remain Contentless, nonce items. Somehow, then, the C-Core delineates an absolute domain for Content matching:

(40)  the slithy trees permanently Contentless
      (the) sturd(s), (will) flim(s) permanently Contentless

The opposite, we note, does not hold. It cannot be the case that Content assignment must pick up the maximal C-Core, as the compositional situation in (39c) clearly illustrates, and where Content is assigned to a domain smaller than the C-core.
A final point is worth stressing. Content matching, we concluded, is not obligatory. No Content is associated with slithy, and if some abnormality is associated with (40), it is not grammatical in nature. If, however, Content matching is optional, then this not only yields the existence of nonce forms as in Jabberwocky, but also allows us to proceed with the derivation of bloody and flakey without, at any point, assigning Content to /ₚblood/ (BLOOD) or to /ₚflake/ (FLAKE). Once Content is assigned to /ₚbloody/ and /ₚflakey/ then, there is little reason to assume that the Content BLOOD or FLAKE are represented. Rather, and assuming that Content may not be overridden, what emerges is that if BLOOD has been matched with /ₚblood/, /ₚbloody/ must be compositional. If, however, Content matching skipped /ₚblood/, /ₚbloody/ may still receive Content which is independent of BLOOD. The system thus yields the result that Content matching may be optional, but is nonetheless restricted so as to allow at most one Content per C-core. To summarize, then:

1. (Maximal) C-Core is the outer bound of Content assignment.¹⁰
2. Content matching is optional.
3. Content cannot be overridden.

nonce forms are licit
at most one Content per C-core

With these initial considerations in mind, let us turn to a more detailed investigation of the domain of Content and its properties.

9.2.2 Phase (and hence Content) at categorization

Within syntactic approaches to non-compositionality, the most fully worked out proposal as to what the syntactic domain of Content might be is that of Arad (2003, 2005). Arad proposes explicitly that Content (in our terminology), compositional or otherwise, is assigned at categorization. We already noted that categorization is clearly the earliest point at which Content could be assigned, and thus the proposal that Content is exactly at categorization seems sensible. As to why Content should be assigned exactly at categorization, Arad, following Marantz (2001), proposes (albeit somewhat tentatively) that categorization defines a phase, in the sense of Chomsky

²⁰C-core_def:

a. ζ is a C-core if ζ is C-equivalent and there is a β such that β is contained in ζ and β is intransitive, and for all x, ζ dominates x and x dominates β, x is C-equivalent.

b. ζ is maximal if there is no γ such that γ is C-core and γ immediately dominates ζ.

(see Chapter 6, section 3 for discussion).

Note now that if any phonological representation could merge as root (cf. Chapter 8), then /ₚation/ or /ₚive/ could merge as roots. In such cases, however, their C-function would be pre-empted as they would be, perforce, intransitive. We note that they can certainly be assigned Content which is in reference to their own function ("use -ation, not -ing"). An illustration of at least one such attested listed case is, of course, /ₚism/. As is expected, when merging as a root, contextually categorized /ₚism/ may be assigned Content, but at the cost of losing its Cₙ[N] function:

(i) The Ism Book: List of Isms
At categorization, according to such an execution, the resulting constituent is shipped over to both spellout and Content assignment (the latter, presumably, part of LF). Once such Content (and spellout) are assigned, subsequent manipulations cannot dispense with them, and are restricted to operations that must apply to an existing Content/spellout pair delimiting all subsequent Content to compositional configurations. The assumption that the relevant domain constitutes a phase for both Content and spellout has subsequently been developed by Marvin (2002) as well as by Embick (2010).

Before proceeding, it is worthwhile noting the fundamental conceptual affinity between any phase-based account of word formation and approaches to word formation which are based on the Level Ordering Hypothesis (cf. Siegel 1974; Allen 1978; Pesetsky 1979; and in particular Kiparsky’s (1982a, b) Lexical Phonology and Morphology (LPM)). Focusing on the execution in Kiparsky (1982a, b), and as already discussed briefly in Chapter 7, section 4, LPM explicitly postulates the existence of morphological blocks which are linked to both Content matching and to phonological effects. The innermost block, Level I, consists of affixes which merge closer to the root/stem. Level I, in turn, is embedded within Level II. Level I affixes, it is suggested, attach to both (attested) free words and to bound bases, their merger may give rise to non-compositionality, and they give rise to weak phonological boundaries (+ boundaries in the sense of Chomsky and Halle 1968 and Siegel 1974), insofar as they do not block assimilation and allow for stress shift. Level II affixes, on the other hand, merge, in that system, only with otherwise free words, giving rise to compositional Content. Being # boundaries, effectively word boundaries, they also constitute a stronger phonological barrier, blocking assimilation and disallowing stress shift. Insofar as each of these levels is presumed to be associated with a clustering of phonological and Content properties, the affinity with the notion of “phase” is self-evident.

Phase at categorization, however, is not identical empirically or theoretically to “phase” as it may be defined through LPM. Specifically, for Arad (2003) as well as for Marvin (2002) the domain is defined by categorization and thus, crucially, at the first affixation of a category-bearing morpheme (including a zero-realized one). Crucially, then, within the Arad system, the Content domain cannot be articulated in terms of the distinction between + affixes and # affixes, nor can it be linked with stress shift or with assimilation (and see Lowenstamm 2010 for this point). Rather, the crucial cutting point is between the merger with a root and the merger with a categorized constituent, a “word”, and where the notion “word” is defined not through the existence of # boundaries, as it would be for LPM, but through categorization. In LPM or in Level Ordering systems in general, on the other hand, categorization is altogether orthogonal. First, by assumption listed forms come with a category, making categorization, as such, a non-stage in the derivation. Even more crucially, categorization fails to characterize, coherently, the distinction between + and # affixes and the phonological effects they give rise to. While by

21 For Arad (2003) as well as for Marvin (2002) and Embick (2010), categorization is always through the projection of a categorial functor such as n, v, a. Hence, by definition, any categorized form is necessarily branching and thus (at least) bi-morphemic.
assumption Level II affixes must be “words” (and hence categorized, Contented, and potentially free), Level I affixes may attach to what are otherwise categorized and Contented “words” and such affixation is assumed, in principle, to allow for both non-compositionality and a weak phonological boundary. A brief summary of the different properties is in (42):

<table>
<thead>
<tr>
<th>Phase at Categorization</th>
<th>Lexical Phonology and Morphology</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. Word:</td>
<td>As defined by the categorization phase; categorized and contented</td>
</tr>
<tr>
<td></td>
<td>As defined by # boundaries. categorized, contented and free-standing</td>
</tr>
<tr>
<td>b. Non-compositionality</td>
<td>No later than categorizing</td>
</tr>
<tr>
<td>c. Merger with non-words</td>
<td>No later than categorizing</td>
</tr>
<tr>
<td>d. Compositional only</td>
<td>Following categorizing</td>
</tr>
<tr>
<td>e. [[X {Y YROOT}] with X,Y category labels</td>
<td>Content of X\textsuperscript{max} only by composing X with Y\textsuperscript{max}</td>
</tr>
<tr>
<td>f. \begin{align*} &amp;\text{transform+ation}++\text{al}</td>
<td>+/#iz</td>
</tr>
</tbody>
</table>

Note that the categorization of the root is a unique point in the Arad system insofar as a root is by assumption devoid of category and may only be categorized once. Any subsequent merger is thus a merger with a categorized constituent.

There is, then, a natural point here at which a phase can be postulated. However, such a phase spans different constituents from those put forth in LPM. In LPM,

\[22\] At least one conceivable way of bringing the accounts closer would be to exclude Level I affixation to “words”. Such exclusion, however, would have to proceed by assuming that e.g. +form+, which merges with +ation, is crucially not a “word” but a root, whereas #+form+#, which is the base for the merger of #ing, is a “word”. The drawbacks of such claims were already reviewed in section 3 of Chapter 7. We note that it would also require the assumption that e.g. +formation+, insofar as it allows for the merger of +al and for stress shift, is a root (or a compound root). The latter claim is in fact advanced in Lowenstamm (2010), who proposes specifically that affixes which occur with + boundaries are roots, rather than functors. The drawbacks for that proposal were already reviewed in section 5 of Chapter 7.

As an aside, note that in LPM, the definition of a “word” is inherently syntactic, and cannot be derived from the properties of word-formation as such. Specifically, if liquid+ate is to be a “word”, it is because at some point, it comes to acquire word boundaries as in #liquid+ate# but no such word boundaries could be in existence in [[liquid+ate]+ation]. Ultimately, then, liquidate is a “word” and hence must be associated with # boundaries exactly when the “morphology” is over and the “syntax” is about to start, i.e. exactly if, and when, liquidate is to merge as a syntactic terminal. It therefore follows that the only possible definition of what is a “word” in LPM is fundamentally syntactic.

\[23\] And setting aside acategorial prefixation; see Chapter 6, section 4 for some discussion.
categorization is not a privileged point, nor is affixation to bases otherwise not independently attested distinct, in principle, from affixation to an attested word, insofar as both are licit at Level I. Thus in LPM the structure and the properties of profusion are expected to be identical to those of contusion, in spite of the existence of (Content for) profuse, but the absence of (Content for) contuse, in English. Likewise, organizational is expected to give rise to stress-shift along identical lines to e.g. comparable (with the EQUIVALENCE Content), although the former by no means involves attachment to anything that could be thought of as a root, and is fully compositional: in both respects arguably not the case for the latter. Rather, what delimits the domains of complexity is whatever distinguishes + boundaries from # boundaries, and with the properties of these boundaries motivated chiefly in conjunction with their phonological properties (cf. Chomsky and Halle 1968). While by assumption in LPM # affixes may only merge with free, unbound forms, merger with free, unbound forms is not sufficient to relegate an operation to Level II (cf. fn. 22).

In LPM, then, non-compositional Content could, in principle, be assigned to both boxed constituents in (42f). Not so, however, for the phase-at-categorizing approach, where non-compositional Content could only be assigned to the combination of the root and the first (categorizing) affix, excluding a multi-affix non-compositional Content which otherwise does allow for stress shift. In fact, the derivation of non-compositional words from existing words, or more accurately put, the derivation of non-compositional phrases from categorized phrases, is explicitly excluded in Arad (2003) as well as in Marantz (2001), Embick and Marantz (2008), and Embick (2010), where it is explicitly claimed that categorized constituents derived from other categorized constituents must be compositional.

Empirically, Arad’s (2003) case is built on case studies in English and in Hebrew. For English, she appeals to the paradigm presented by Kiparsky (1997) contrasting (43) with (44), and recasting it in terms of “derivation from word” vs. “derivation from root”, and with the former, by assumption, categorized.24 Specifically, she suggests that while the verbal instantiations of hammer and paint are derived from the roots √HAMMER and √PAINT respectively, and have the structure in (43a), the verbs tape, lacquer, and screw are derived from categorized nouns, and hence must be compositional:

(43) a. [\text{现有} \text{HAMMER} \text{V_o}]  
   b. I hammered the nail in (with my sandal)  
   c. I painted the wall (with lacquer)

(44) a. [\text{现有} \text{TAPE} \text{N_o} \text{V_o}]  
   [derived from word, and hence rigid]  
   b. I taped the picture (*/#with pushpins)  
   c. I lacquered the wall (*/#with paint)  
   d. I screwed the fixture on the wall (*/#with nails)

24 Recall that for Kiparsky, the paradigm served to argue that V→N is Level I and hence can change Content, but N→V is Level II, and hence cannot result in Content change. For Kiparsky, however, both operations involve a derivation from a categorized word.
The paradigm was already discussed at some length in Chapter 7, section 4.1, in the context of zero affixation.\textsuperscript{25} We note here, as we did there, the circular nature of the argument. We note a further problem for Arad, namely the need to actually \textit{block}, for roots such as $\sqrt[5]{\text{Tape}}$ or $\sqrt[5]{\text{Screw}}$, the derivation in (43a). The problem, as such, didn’t exist for the Kiparsky account because of the assumption that \textit{tape} and \textit{screw} are listed as nouns, an option not available to Arad.

While the theoretical difficulties are significant, as already observed in Chapter 7, section 4.1, is the fact that the effects reported in Kiparsky (1997) appear to emerge directly from having failed to correctly identify the relevant Content of terms such as \textit{tape}, \textit{lacquer}, and \textit{screw}. In other words, (44b–d) are cases of (Content) coercion. Once the Content is more accurately identified, the coercive effect disappears:

\begin{itemize}
  \item a. Lola taped the poster to the wall with band aids/mailing labels
  \item b. screw the fixture on the wall with nails (ok, providing nails are twisted to affix the fixture) (Harley and Haugen 2007)
\end{itemize}

(45) Bento boxes of the week: lacquered with bitter persimmon juice (G)

As for Hebrew, Arad’s (2003) arguments, as it turns out, not only do not generalize, but are in themselves self-defeating. Specifically, consider the root $\sqrt[5]{\text{xšb}}$ already discussed briefly in Chapter 8, section 1.2. We noted that at least in some of its contexts, it may correspond to an arithmetical operation, and that is indeed the case for \textit{xešbon}, a noun with the Content \textit{CALCULUS}; \textit{ACCOUNT}; \textit{ARITHMETIC}. The noun \textit{xešbon}, in itself, is not associated with a verbal morphological template (binyan) of any sort. Rather, it is constructed on the basis of a nominal morphological template (mišqal), consisting of both a vocalic melody and a suffix, and otherwise attested relatively widely in the language. Suppose we now assume, with Arad, that for each of the cases in (47), the mišqal acts as an auto-segmental morpheme, effectively a C-functor in our terms, merging with the root and returning a noun (i.e. an \textit{n} in Arad’s terms), e.g. as in (48) (the \textit{i/e} vocalic alternations as well as the emergence of \textit{a} in some forms but not in others in (47) are triggered by the phonological properties of the consonants of the root, its “radicals”; \textit{R}_{1,2,3} for root radicals).\textsuperscript{26}

(47) \textsc{mišqal}: $R_1R_2R_3$on:
\begin{quote}
\begin{center}
\begin{tabular}{ccc}
Š\textit{iR}Yon & \textit{XeRB}on & \textit{Re'a}Yon \\
\textit{BiTa'on} & \textit{GiLaYon} & \textit{XeŠBon}
\end{tabular}
\end{center}
\end{quote}

\begin{itemize}
  \item armor a bad mess interview journal sheet calculus, account, arithmetic
\end{itemize}

(48) $[\textit{n} \text{\textsc{C}}_{0/1} \text{\textsc{C}}_{n} \text{\textsc{R}}_{1,2,3}]$

\begin{itemize}
  \item \textit{i—on}
\end{itemize}

\textsuperscript{25} And note, in this context, that for Arad (2003), the structure for (44a) perforce involves the stacking of two categorical Ø affixes. See Chapter 7, section 2 for some relevant discussion.

\textsuperscript{26} Mišqalim, as such, are not discussed in this work, although see Chapter 10 for brief comments. From the perspective of the XS system, we note that the CCS of C-functors which merge with roots, in Semitic systems, is not self-evident. I return to this matter in Chapter 11, section 5.
As it turns out, at least some of the nominals in (47) can now give rise to verbs. The Hebrew verbal system is morphologically extremely strict and may only accommodate consonantal root radicals, but in what is, no doubt, an example of the great ingenuity of natural language, the consonant tier of the nouns in (47), including the suffixal consonant realization /pn/, may now become the base from which a verb may be derived, giving rise at least to the quadro-radical forms in (49a), patterning with otherwise attested quadro-radical forms, as in (49b). Note that the derived consonantal strings can occur in more than one pattern (binyan): 27

(49) a. XiŠBeN hitXaŠBeN XiRBaN hitXaRBaN
    calculated (t.) settled accounts (int.) messed up (i.) became messed up (int.)
ŠiRYeN Ri’aYeN hitRa’aYeN
    armored interviewed (t.) interviewed (int.)

b. TiRGeM CiMCeM CiMReR
    translated narrowed-down shivered

The process of thus deriving verbs is not an isolated one. A similar process occurs in other misqalim, to wit, the cases in (50) in which it is the prefixal /m/ which is incorporated into a derived verb:

(50) a. miSXaR miSGeReT maXŠeB
    commerce frame computer
b. MiSXeR MiSGeR MiXŠeB
    commercialized framed computerized

The cases in (49a) and (50b), Arad argues, instantiate the derivation of words from “words”, rather than from roots. If, indeed, words derived from (categorized) words must be compositional, we expect the full compositionality of the resulting verbs, a claim that certainly seems to be corroborated by the examples above. Pointing to the great variation of the Content resulting from the combinations of the root π√xsˇb with different binyanim (see discussion in Chapter 8, section 1.2), Arad specifically contrasts it with the stability of Content attested with the verbs derived from the consonantal base XŠBN of xešbon, ‘calculus; arithmetic; account’ which includes the consonant of the nominal suffix (cf. 49a):

(51) a. π√xsˇb
    xasab ‘thought’ xisben ‘calculated’
    nexsab ‘was.considered’ hitxsasben ‘become calculated’
    xisxeb ‘calculated’ ‘settle accounts’
    hexxib ‘gave.importance’

27 See Bolotsky (1978, 1999), Bat El (1986, 1989, 1994a, and subsequent), and Usshiskin (1999, 2003), i.a., for much discussion of the process involved. At least Bat El and Usshiskin take these forms to argue against the existence of roots altogether, whether basic or derived. For a review of the relevant debate see Arad (2003, 2005).
Alas, this very example, as it turns out, illustrates the exact opposite of what Arad was seeking to show. While the glosses are certainly accurate, note that the English expression ‘settle accounts’ is in actuality ambiguous—on one of its readings it is entirely compositional. On its other reading, it is non-compositional and as such synonymous with RETALIATE. As it turns out, the Hebrew verb hitxašben ‘settle accounts’ is ambiguous in that exact same sense. In addition to its straightforward compositional Content, it also means RETALIATE, a reading that most certainly does not derive from the Content of the noun xešbon ‘calculus; arithmetic; account’. It is worthwhile noting that the noun xešbon cannot be combined with any light verb to give rise to the relevant RETALIATE Content, making a light verb construction an impossible source for the non-compositional Content under consideration. While light verb constructions with xešbon do exist, their Content is not RETALIATE, and whatever Content they do have cannot be converted to a verbal one.28

Nor is this an isolated incident. Of the few examples noted, l/mširyen/, literally DON ARMOR, also has the Content of SECURE A PRIVILEGE, and in what is a rather spectacular example of derived non-compositionality, consider the following cases, where verbs associated with the original tri-radical root have a related Content, entirely predictable from that of the binyan I form. While those derived from the noun (by assumption) still retain their compositional Content, this is by no means the only Content they have, nor is it the more dominant one.29

28 Phrasal idioms which are the exact translation of English ‘settle accounts’ and which involve xešbon do occur, but not with a light verb, but rather with the verbs sidder, literally ‘arrange, settle’ or sagar ‘close’. In turn, the verb sidder (or histadder, its inchoative correlate) may convey the Content RETALIATE or TRICK without a direct object altogether, and is also found in a large array of phrasal idioms with a similar Content but distinct object, none of which give rise to a verb with the relevant Content:

(i)  a. histaddarti ʼito
    I settled with-him (including retaliation)

   b. siddarti ʼito
    tricked-I him

(ii) a. siddarti ʼito ʼet ha.xešbon(ot)
    settled-I with-him om the.account(s)
    lit. but also ‘retaliate’

   b. siddarti ʼito ʼet ha.inyanim
    settled-I with-him om the.matters
    lit. but also ‘retaliate’

   c. siddarti lo ʼet ha.roš
    settled to-him om the.head
    lit. ‘I sorted out his head’ idiomatic: ‘forced him to comply’

29 Because the “derived roots” by necessity are quadro-consonantal, they can only occur in binyanim III and VII which are morpho-phonologically compatible with quadro-radical roots.
(54) is indicative not only of the productive nature of the process, but also of the almost immediate availability of non-compositional Content; on a personal note, the underlined verb in (54) is sufficiently recent and sufficiently obscure to have required an explicit inquiry, on my part, as to its Content:

(54) Amir Goldberg minnep 'et ḫisqey ha.barim ֶšlo
Amir Goldberg leveraged on business bars of-him
‘Amir Goldberg leveraged his bar business’

Quite apart from the specific complexity of Hebrew derivatives, a return to English reveals that a fair number of complex derivatives display non-compositionality clearly beyond the categorizing domain:30

(56) a. reactionary
b. globalization
c. naturalize
d. activism/activist
e. protectionism
f. existentialism
g. differential (math)
h. exceptional (‘EXCELLENT’)
(i) editorial
(j) editorialize
(k) sensational
(l) relativity
(m) naturally (OBVIOUSLY)
(n) civilization

(30) With thanks to H. Harley (p.c.) for naturalize and editorial.
It thus appears that categorizing is too narrow a domain. If, indeed, non-compositionality is phase-based, then the phase under consideration must be larger than that including the root and its first categorizing environment.

Before moving on to other possible domains for the assignment of Content, it is worthwhile considering the way in which Arad’s system may handle the two questions we posed in section 9.1. Recall that we observed the following two distinctions between AS-nominals and R-nominals:

(57) a. AS-nominals must be compositional; R-nominals may be non-compositional.
   b. AS-nominals must involve an affixation to an attested verb; R-nominals need not.

At first glance, Arad’s approach appears to offer a potential unified solution to these two puzzles. If AS-nominals involve the merger of $C_N$ to a categorized $V$ (say an instance of ATK), but R-nominals involve the attachment of potentially that same suffix directly to a root, then the prediction would be that the latter, but not the former, would allow for non-compositional Content. In turn, the event properties associated with AS-nominals might follow, within such an account, from the existence of a verb in its derivational history, vs. the absence of such a verb for R-nominals. The account would then need to be supplemented with the reasonable claim that categorized $V$ (or $v$) does correspond to independently attested verbs, but not necessarily roots. We note that at least one interpretation of Marantz (2001, 2007), appears to suggest this type of execution with an affix merging below or above $v$ and with the consequent argument structure configuration thus emerging.

In sections 9.3–9.5 I turn to the discussion of my own proposal, which hinges greatly on the fact that AS-nominals contain not just a verb but also the functional structure associated with it, while R-nominals do not contain such functional structure. Fundamentally, then, I endorse, of course, the claim that there is more “verbal structure”, of sorts, in AS-nominals than there is in R-nominals. The devil, however, is very much in the details here, and a careful examination of the actual workings of the Arad proposal, or that of Marantz (2001), shows that regardless of the validity of the intuition, an execution within the Arad model encounters serious difficulties.

First among the emerging problems has to do with argument structure, which is attested in AS-nominals but not in R-nominals. If we are to assume that the reason for the asymmetry is that the former, but not the latter, involve the existence of a verb node of some sort, this amounts to the tacit assumption that roots do not assign arguments, including internal ones, but rather verbs do. But if verbs rather than roots assign arguments, where would such arguments come from? Clearly they cannot be listed—verbs in this model are not listed, and certainly not with argument-assigning possibilities. Roots, of course, are listed, and in that model potentially with arguments, but if the argument comes from the root, the asymmetry between R-nominals, built from the root, and AS-nominals, built from a verb, cannot be captured (and see
Chapter 8, section 3 for some relevant discussion). If, on the other hand, verbs were to come complete with some functional structure which is responsible for the licensing of arguments and event structure, then the distinction could be captured, but in that case, the distinction between R-nominals and AS-nominals would no longer follow from merger to a root vs. merger to V (or v). Rather, it would follow from the presence in AS-nominals of some event functional structure vs. its absence in R-nominals. Unless one is to propose that the existence of V is directly contingent on the existence of such functional structure, there would be little reason to bar both AS-nominals and R-nominals from being derived from a V (or V-equivalent) constituent, then, with the distinction between them reducible to the presence of functional structure above such a V or V-equivalent node. The obvious advantage, of course, would be to allow a uniform morpho-phonological statement concerning the properties of forms such as destruction, allowing us a unified statement concerning the properties of ATK (=C_N[v] across the board), merging systematically with a V-equivalent constituent.

The second execution difficulty harks back to the claim that the crucial domain is that which distinguishes categorized constituents from uncategorized ones (the latter by assumption roots). R-nominals, compositional or otherwise, can be formed not only from “roots” or, for that matter, from mono-morphs, whatever they turn out to be, but also from derived verbs. Consider, in this view, an R-nominal such as organization, plausibly composed of the Content of organize, and globalization, under the theoretical economic model reading, which is specifically not composed from the content of globalize, or for that matter civilization, as in reference to a society or a culture. Insofar as we can say (and see Chapter 6, section 2 for much discussion) that organize is a verb in both the AS-nominal and the R-nominal instantiation of organization, it is clear that the absence of argument structure cannot be derived from the absence of V. Insofar as globalize or civilize are clearly categorized, the non-compositional readings of globalization and civilization specifically emerge well past categorization, and involve merger with an otherwise categorized V. In turn, the non-compositional instantiation of globalization and civilization not only can be, but must be R-nominals. It thus follows that the presence of V may be necessary, but cannot be considered sufficient for the emergence of an AS-nominal. If, then, the restrictions in (57) are to be derived, it cannot be the case that the distinction is between categorized constituents and roots, as clearly attachment to already categorized constituents can give rise to both non-compositional Content and to R-nominals. On a more conceptual level, we note that insofar as under such an execution -ation must be assumed to possibly attach both to a bare root and to a zero-derived verb, any representation with -ation is perforce potentially structurally ambiguous, raising serious issues concerning our ability to verify the structure involved away from theory internal considerations, a point already discussed in Chapter 7, section 3.

31 Alternatively, one could assume that the root selects the argument but the verb assigns it. Barring overwhelming evidence for the separation of selection and assignment, I will assume this to be the worst possible execution.

32 Globalization: “The idea that the world is developing a single economy and culture as a result of improved technology and communications and the influence of very large multinational corporations”. Note that under that reading, globalization has a very different reading from globalizing. Globalize: “To make a business begin operating all over the world” (Macmillan Dictionary).
Finally, and as already briefly noted, postulating first categorization as the sole juncture for Content matching would require divorcing the notion of phase as it applies to Content assignment and the notion of phase as it applies to phonological effects. Both stress shift and assimilation are not restricted to the domain of first categorization, and are rather constrained by boundary type. There is no difference, in other words, between whatever phonological effects are attested in nation and in nationality, and assimilation, in e.g. illogical, applies even though in- attaches to the fully categorized form logical. If, indeed, first categorization is a phase, one would be hard pressed to successfully define it as a coherent phonological domain (and see in particular Lowenstamm 2010 on this point).33

9.2.3 Phase (including Content) by Level Ordering

We noted that (first) categorization is not only too narrow a domain for the assignment of Content, but it is also too narrow a domain for spellout, and that both stress shift and assimilation are more properly characterized as properties of + boundaries, rather than effects which emerge from merger with a root.

A more plausible phase, it would appear, might be that which separates + and # boundaries. That this is, indeed, the case is explicitly proposed in Lowenstamm 33 An argument to the contrary is mounted in Marvin (2002), based on the existence of pairs such as those in (i), where the reduced forms correlate with non-compositionality, while the non-reduced forms are compositional:

(i) a. comparable twinkling lightning
    b. compárrable twink(e)ling lightening

The observation is certainly correct, but it is not entirely clear what is to be made of it. We note, at the outset, that reduced forms can be compositional, e.g. imag(i)nable (vs. imagin), while non-compositional forms need not be reduced, e.g. despicable (but *déspicable). Fundamentally, then, little can be said about the cases in (ia, b) beyond what is a suggestive but non-deterministic correlation between Level # affixes and compositionality, coupled with the observation, also previously made, that e.g. -able shows, at times, the characteristics of + affixes and at other times the characteristics of # affixes. In turn, and insofar as ING, by assumption in e.g. Embick (2010), attaches to v and never to a root, pairs such as twinkling and twink(e)ling could only be reconciled with the existence of a second ING affix which need not attach to v. But once two distinct suffixes are postulated, we are free to assume that one of them is #ING while the other is +ING, thereby accounting for the stress effects without resorting to root merger.

We note in this context that it is far from obvious that the affix involved is, across the board, ING. English does have an affix LING, an instance of C, with a clearly diminutive function, as in changeling, duckling, gosling, or inkling, raising the distinct possibility that the correct parse for twinkling should be twink+ling, rather than twinkle+ing (twink c.1400, ‘a winking of the eye’, online Etymological Dictionary <http://www.etymonline.com/index.php>). Similar analytic problems may plague the contrast between lightening and lightning. Specifically, for the relevant distinction to emerge, it is required that light(e)n be a root in lightning (√LIGHTEN-ING), but that the root in lightening be √LIGHT (-EN-ING). But if the roots as well as the structures of lightning and lightening are distinct, any attempt to correlate the resulting Content so as to draw conclusions on the correlations between stress and Content appears ill judged. Finally, and perhaps most awkwardly, we note that if the cases in (ia, b) truly are phonological effects reducible to root-attachment and root-attachment alone, there would emerge a need for three, rather than two, phonological boundaries; that which separates a root from its categorizer, that which characterizes Level I affixes, and finally that which characterizes Level II affixes.
At the relevant phase boundary, then, sufficient aspects of the phonology would be spelled out so as to fix them beyond susceptibility to stress shift or assimilation, and Content would be assigned so as to force any subsequent additional Content assignment to be compositional. To illustrate, consider (58)–(59) (●● for phase), and note again that the prefixation of in- is to the already categorized form logical:

(58) a. \( \langle 1, [\alpha^L (\text{ Logical } + \text{ ICAL})] \rangle_1 \)  
   Spellout: /\( \pi \) logical/  
   Content: LOGICAL

   b. i \( \langle 1, \text{ IN} + [\alpha^L (\text{ Logical }) + \text{ ICAL}] \rangle_1 \)  
       Spellout: /\( \pi \) illogical/  
       Content: IRRATIONAL

   ii. \( \langle 2, [\text{ UN} \# \alpha^L (\text{ logical})] \rangle_1 \)  
       Spellout: /\( \pi \) unlogical/  
       Content: NOT LOGICAL

(59) a. \( \langle 1, [\alpha^L (\text{ Global } + \text{ AL} + \text{ IZE})] \rangle_1 \)  
   Spellout: /\( \pi \) globalize/  
   Content: MAKE GLOBAL

   b. i \( \langle 1, [\alpha^L (\text{ Global } + \text{ AL})] + \text{ IZE}] + \text{ ATION} \rangle_1 \)  
       Spellout: /\( \pi \) globalization/  
       Content: ECONOMIC SYSTEM

   ii. \( \langle 2, [\alpha^L (\text{ globalize})] \rangle_1 \# \text{ ING} \)  
       Spellout: /\( \pi \) globalizing/  
       Content: MAKING GLOBAL

Spellout, then, does not differentiate merger with roots from merger with categorized constituents. If Content matching is at categorizing, then it follows that Content matching is not at phase boundary, or at the very least, it does not define the same “phase” as that defined by spellout. In turn, and specifically because it appears that Content matching need not be at categorization either, it might be worthwhile pursuing the possibility that in line with the Level Ordering Hypothesis, it is indeed the boundary between Level I and Level II that defines a phase, delimiting both phonological and Content effects, very much along the original lines proposed in Kiparsky (1982a). The result would be the prediction that Content is affected by + boundaries, but not by # boundaries, and that categorization, on the other hand, is simply irrelevant.

One point is worth noting, as it pertains specifically to the applicability of a phase-based execution. We note that if the relevant phase boundary is to be identified with, e.g., the first occurrence of a # boundary, or a # affix, then the inevitable consequence is that some notion of a cycle which is formally distinct from phase must be maintained. Specifically, consider an expression such as editorialize under both its compositional and its non-compositional instantiations:

(60) a. \( \# [\alpha^L (\text{edit}) + \text{ or}] + \text{ al}] + \text{ i ze}] \# \)

b. \( \# [\alpha^L (\text{edit}) + \text{ or}] + \text{ al}] + \text{ i ze}] \# \text{ ing} \# \)

There is in fact no consensus in the Level Ordering literature on whether the boundary associated with -ize is +, #, or possibly both. The + status is favored in (60) precisely because proponents of Content solely at + would have to postulate such a boundary, to accommodate the Content change affected by -ize. If # were favored for editorial#ize, we note, then it would become a direct counter-example to any attempt to restrict (atomic) Content assignment to Level I.
Within Level I, by assumption now a single phase including the entire expression between \# boundaries in (60a), the atomic Content matched with \([V_{[A[N/A[N[c=v edit]+or]+y]+al]+ize]}\) would correspond to EXPOND or PONTIFICATE. By assumption, atomic Content could not be matched with the entire expression in (60b), because ING is a \# affix, only available at Level II, clearly here a desirable result. \([V_{[A[N/A[N[c=v edit]+or]+y]+al]+ize]}\), in turn, need not be assigned Content in its entirety, but can also be assigned compositional Content. The assignment of such compositional Content, however, would have to proceed cyclically, starting, presumably, with assigning Content to [edit] and then proceeding incrementally to include +or, and then +y, +al, and finally +ize. It therefore follows that at the very least, within Level I there could be two instances of Content assignment—one to the first cycle, and one to the maximal one.

Even more importantly, note that \([A[N/A[N[c=v edit]+or]+y]+al]\) can be assigned non-compositional Content as well, roughly that of OPINION PIECE, and editorialize could further be composed of [OPINION PIECE]+ize. Clearly, then, if Level I defines a single phase, it could not be the case that each phase, as a whole, interacts with Content matching. Rather, we must opt for a cyclical process of Content matching, as based either on an incremental derivational approach (ship a representation to Content at the end of each cycle) or alternatively, retain the cyclic representation of editorialize throughout Level I, allowing Content matching with any well-defined constituent within it:

\[
\begin{align*}
(61) \quad & i \ [c=v edit] & \rightarrow \pm \text{Content}; & \text{if } [-\text{Content}] \text{ then ii} \\
\quad & ii \ [N[c=v edit]+or] & \rightarrow \pm \text{Content}; & \text{if } [-\text{Content}] \text{ then iii} \\
\quad & iii \ [N/A[N[c=v edit]+or]+y] & \rightarrow \pm \text{Content}; & \text{if } [-\text{Content}] \text{ then iv} \\
\quad & iv \ [A[N/A[N[c=v edit]+or]+y]+al] & \rightarrow \pm \text{Content}; & \text{if } [-\text{Content}] \text{ then v} \\
\quad & v \ [V_{[A[N/A[N[c=v edit]+or]+y]+al]+ize]} & \rightarrow \pm \text{Content}.
\end{align*}
\]

With the caveat just noted, a phase-based execution, if grounded in something like the Level Ordering Hypothesis, would, in all likelihood, fare better than the Categorization-as-Phase approach in defining an overlapping domain for phonological and Content effects. Such an execution, however, would be also directly inheriting a host of problems otherwise noted with Level Ordering approaches, some of them quite crucial in attempting to create a coherent phase which defines a unified domain for phonological and Content-based processes. Among other matters, the claim that all + affixes merge as a block within \# affixes leads directly to endemic bracketing paradoxes. To illustrate: if, as is often claimed, -ment (or for that matter -ize) is a Level II affix, we do not predict it to cause stress shift, and indeed it does not (cf. 62a). However, -al, may occur after government, and -al clearly is a Level I affix which does cause stress shift, and indeed, stress does shift in (62b). -ize, frequently claimed to be Level II, may then attach to -al with no stress shift emerging, but then it too may be followed by a certified stress shifter such as -ation, as (59) already shows. Other paradoxes are attested in the interaction between e.g. -able and -ize, -able and -ity, and others:

\[
\begin{align*}
(62) \quad & a. \ \text{govern} \rightarrow \text{government} & \rightarrow *\text{government} \\
\quad & b. \ \text{government}+al \rightarrow \text{governement}+al
\end{align*}
\]
c. governméntal#ize → governméntal#ize
  d. governméntal#ize+ation → governmental#ize+ation
     → *governméntal#ize+ation

(63)  a. attribute → attribute#able → attributabíl+ity (and compare attributable#ness)
     *attribúte#able
  b. vérb+al → vérbal#ize# - → verbal#íze#able
     *verbál#ize

The picture, we note, is not an incoherent one, rather to the contrary. If one regards a boundary type as a name for a phonological process, then the generalizations are quite clear. Some affixes cause stress shift: let us refer to them as \(+\) affixes. Others do not: let us refer to them as \(#\) affixes. It is specifically the ordering of these affixes as blocks that appears problematic. But if affixes that trigger stress shift cannot be ordered into a block that is contained within affixation processes that do not cause stress shift, then it is very hard to see how the distribution of such affixes can possibly serve as the foundation for defining a coherent constituent within which Content may or may not be matched, and the attempt to define a phase on the basis of stress shifting or, for that matter, on the basis of Levels of affixation as in the Level Ordering Hypothesis, appears to be altogether a doomed enterprise.

To add insult to injury, and as the list in (56) already reveals directly, non-compositional Content formation clearly does allow the inclusion of \(#\) boundaries. -is\{t/m\} for instance, is implicated both in existentialism/existentialist and in activism/activist, and yet this is clearly a \(#\) affix and hence by assumption Level II. -ize, if indeed a \(#\) affix as some contend, likewise is available to merge with editorial and natural and give rise to a non-compositional Content. Even nominals -ing and -er, clear, productive instantiations of Level II affixes, give rise to non-compositional Content, as already noted in section 9.1 (cf. (11)–(12)):

(64)  a. Debut author Matt Norman has “the making of a powerful voice in fiction” (G) (=POTENTIAL OF BEING)
  b. the reading of this phrase (*by linguists) (=INTERPRETATION)
  c. belongings, fitting, tailing, workings
  d. pretender, dictator

Multiple other such cases are attested. Whether e.g. edit+or or writ+er in themselves are compositional may be up for debate, but not so the clearly atomic Content associated with e.g. dictator or pretender. Nor is it easy to come up with a compositional Content for helpless or countless that would paraphrase as without help or without count, on a pair with the clearly compositional flawless or childless. A similar case can be made on the basis of accomplished, with its ADEPT non-compositional reading, although -ed is a clear instance of a \(#\) affix.

And finally, compounds are endemically non-compositional. And yet, at least Kiparsky (1982a) is very committed to the classification of compounds as Level II (or even later), an assumption certainly justified by their failure to display phonological assimilation effects of any sort as well as by their high degree of productivity:
Lest some obscure historical drifting is implicated (and assuming “drifting” is a well-defined process which is somehow distinct from the emergence of non-compositionality), we note that at least the following are extremely recent and yet non-compositional:

(65) a. paleface; redneck; bigfoot bluebeard
    b. fellow; traveler; fireman; firefly; blackboard; stonewall
    c. crystal gazing; shoplifting; facelifting; troubleshooting

The conclusion is that if we take a boundary type to be indicative of a certain set of phonological effects, we find it to correlate neither with the assignment of (non-)compositional Content, nor with the order of affixation. By way of a final problem we note that the claim that + boundaries but not # boundaries may merge with non-words, by assumption uncategorized roots, is problematic as well. A rather cursory perusal of a reverse dictionary revealed, at the very least, the cases in (67), both with ism/ist and with Level II negative affixes, the latter at the core of Allen’s (1978) original claim on the inverse correlation between phonological (non-)transparency and Content (non-)compositionality:

(66) a. network; email; bean counting
    b. dipshit; pothead; harebrain

(67) a. altruism; autism; congruism; deism; embolism
    b. uncouth; unfurl; unwieldy; unkempt; ungainly
    c. non-chalant; non-descript

Sure enough, there are affixes in English that only attach to already attested words, and all of them do seem to be # suffixes, and both ING and LESS certainly appear to fall within that class. Whatever the best way to characterize these affixes might be, however, postulating a phase boundary such that it separates these specific affixes from other # affixes does not seem warranted, all the more so as even these suffixes do allow the emergence of non-compositional Content. Rather, the picture that emerges is that phonological domains as defined by boundary types cannot really be coherently mapped, as such, onto Content domains. First, because the strength of phonological boundaries in itself does not lend itself to a block organization, and second, because Content seems altogether blind to the nature of these phonological boundaries, allowing a single Content for constituents as large as [shoplifting or existentialism], and as small as round.

Finally, and empirically crucial, a phase boundary between Level I and Level II is in principle incapable of providing us with any insight on the contrasts between R-nominals and AS-nominals discussed in section 9.1 (and see also the summary in (57)). The reason is that insofar as the key distinctions made by the Level Ordering Hypothesis involve the properties of particular affixes, and insofar as an R-nominal such as transformation, in both its compositional and its non-compositional instantiation, has identical phonological properties to those of the AS-nominal transformation, there simply couldn’t be a meaningful distinction between R-nominals and AS-nominals within any phonologically-based Level Ordering system.
9.3 ExP-Segments and S-Functors—the Content Domain

9.3.1 Introduction

Suppose we make explicit the workings of Content matching. As noted previously, I specifically assume the existence of atomic, indivisible Content units, stored in a reservoir called the Encyclopedia, together with an interface device capable of matching Content units with grammatical representations of some sort. More specifically, I assumed that “non-compositional” Content, in the sense utilized throughout this work, refers to the results of a single, successful en-search, returning a single atomic Content unit. For example, transformation, in its technical sense, is non-compositional, because a single en-search could return an atomic Content unit for it, namely the particular Content of the technical term under consideration. Crucially now, we note that there is no difference, within such a conceptualization, between the Content associated with transformation and the Content associated with round, in any of its instantiations. In the absence of Content for roots as such, the assignment of Content is unified, and is accomplished at exactly one point, regardless of the derivational complexity of the forms under consideration. Content is thus matched with \([\text{trans} \in \text{FORM}]\), \([\text{ROUND}]\), and \([\text{N} \in \text{V} \text{FORM}]\) in an identical fashion, with a single en-search returning, successfully, one unit of atomic Content for each of the boxed items. In the absence of any independent Content for \([\text{ROUND}]\) or for \([\text{FORM}]\), such Content need not be overridden or suppressed in order to give rise to the atomic Content which is associated with a potentially larger constituent, and the absence of coercion effects already noted in section 4 of Chapter 8 follows directly.\(^35\)

In contrast, the constituent ate the potatoes in John ate the potatoes cannot be matched with a single unit of atomic Content, but rather appears to be assigned two such units of atomic Content, for eat and potato(es) respectively, and with the overall interpretation of the relevant constituent emerging from composition. It is precisely because of this that coercion-like effects are attested if, instead of the potatoes, John chose to eat his television. There are, in principle, two possible reasons for the failure of ate the potatoes to be assigned single atomic Content. One would be the accidental absence, in the Encyclopedia, of a Content item that corresponds to the representation of [ate the potatoes]. If that is the case then representations very much like [ate the potatoes], however we end up characterizing them, should at least sometimes be associated with an atomic Content. The second possible reason for the absence of a single atomic Content corresponding to [ate the potatoes] would be more general—such an absence would reflect the fact that for some reason, the representation [ate the potatoes] is not an appropriate domain for a single en-search. If that is indeed the case, then constituents which are like [ate the potatoes] could never be assigned a single atomic Content and

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\(^{35}\) And see discussion in Chapter 10, section 5 on shared Content and the categorial label in cases such as \([\text{ROUND}]\) and \([\text{V} \text{ROUND}]\).
whatever meaning is associated with the expression as a whole would need to avail itself of compositional processes.36

Note now that at least thus far, the view sketched here on Content matching is theory-neutral. Thus, for instance, if one were to adopt Level I in the sense of LOH as the relevant domain of Content, one could say that the input to en-searching is a string of morphemes together with their phonological boundaries, and that en-searching may not cross # affixes or # boundaries i.e. that representations which include # affixes or # boundaries may not constitute a single en-search domain, and thus a single atomic Content unit cannot be matched with them. Under the plausible assumption that both ate and potatoes come with # boundaries, then the emerging result within such an execution would be, likewise, that ate the potatoes and similar syntactic constituents cannot be matched with atomic Content for principled reasons. Similarly, one could claim that the input to en-searching is a syntactic representation complete with category labels, and that a single en-search may not cross a categorially labeled bracket. The result would be, effectively, the Arad (2003) system, insofar as categorization would stop en-searching and any Content assigned to a constituent which has a categorical node embedded within it would need to involve either additional en-searching or some functional composition. Finally, a phase-based execution of any of these approaches would ship a representation to be en-searched upon encountering a # bracket or a # affix, or alternatively, upon encountering the first categorially labeled bracket. It thus emerges that what distinguishes the different proposals reviewed here concerning the domain of Content need not involve the overall architecture of the grammar, or the way in which Content interacts with grammatical representations, as all these executions are, at least in principle, compatible with the broad view of Content and en-searching presented here. Differences, such as do exist, concern the specific structural domain within which a single en-search is possible, and thus rise and fall on the empirical consequences of these differing proposals. There is a local domain within which non-compositionality, or a single atomic Content unit, may be available. Beyond that local domain, Content must be compositional. What is under consideration, then, are the following questions:

(68) a. What is the domain of Content (alternatively, of en-searching)?
   b. Does the domain of Content converge with some well-defined domain of spellout?
   c. Should (b) turn out to be workable, are there empirical advantages to a phase-based execution?

In the previous section, I reviewed two answers to (68a)—one involving phase (and Content) at categorization, and the other phase (and possibly Content) at the boundary between Level I and Level II affixation. Crucially, I showed that within either approach, the domain of Content cannot be shown to converge successfully with some domain of spellout, making (68c) moot for these approaches. To even

36 And see appendix on the Content of phrasal idioms such as spill the beans or kick the bucket.
graver effect, I showed that neither one of these approaches properly identifies the actual domain of Content, or differently put, that the answers provided for (68a) within these approaches are empirically flawed. Clearly, an answer to (68b) and (68c) is contingent on an empirically adequate answer to (68a), a matter that I undertake in this section. In section 9.4, I turn to address at least some aspects of question (68b), elaborating on the specific relations between phonological representations and Content. Equipped with the conclusions reached in sections 9.3 and 9.4, I turn, in Chapter 10, to a phase-based execution of the derivation of complex words.

9.3.2 Delimiting en-searching—assigning Content to the C-core

Suppose we consider again the difference between R-nominals and AS-nominals, together with the surprising fact that the former, but not the latter, allow for an atomic Content reading. I already noted that insofar as they are morpho-phonologically identical, neither Content at categorization norContent at # can hope to capture this fact in a straightforward way. Cast in the specific terminology just outlined, what is in need of explanation is why R-nominals can be targeted by a single en-search and hence be associated with an atomic Content, but not so AS-nominals.

Recall now that AS-nominals but not R-nominals are associated with event structure, and specifically, that event structure involves the merger of a full functional event complex, by assumption consisting of ExP-segments which are members of \{Ex[V]\} or \{Ex[A]\}. Such a functional complex is, however, absent in R-nominals. Suppose, then, that the relevant ExP-segments are implicated not only in the emergence of event structure but also in preventing the emergence of atomic Content. Subject to some further fine-tuning, then, let us propose the initial description of the domain of en-searching as in (69), noting that at least some of the properties listed in (69) should, and could, be derived (and see Chapter 10, section 2 for the final formulation):

(69) En-searching, description (very preliminary)

i. En-searching matches (unique) Content with C-cores.
ii. En-searching operates on bracketed strings.
iii. Content is optional.
iv. ExP-items define a final en-searching domain (effectively, en-searching cannot cross an ExP-item; close, note, but not quite identical to (i)).

Anticipating the discussion in section 3 of Chapter 10, note that as stated, (69iv) leaves the relevant notion of “ExP item” rather formally unclear, and that the lack of clarity is empirically consequential. Specifically, and depending on how “item” is interpreted (head, edge, bracket, ExP-set) the emerging domain may be distinct, as depicted in (70a–c). As it turns out, however, under any of these formulations the boxed string in (70d) is an impossible en-searching domain. (70d), in turn, is exactly the domain of AS-nominals, as shown in (71). It thus emerges that under any interpretation of “item” in (69iv), AS-nominals cannot constitute an appropriate domain for en-searching:
AS-nominals notwithstanding, there are, in actuality, empirical and formal reasons to favor the choice in (70b), a matter I return to in Chapter 10, section 3. For the time being, and focusing on AS-nominals where the choice is immaterial, I will set this matter aside.

Another area of formal vagueness, specifically in (69ii), reveals itself directly when we attempt to actually implement the system. Specifically, given the adjunction structures assumed throughout this work, we must ask whether en-searching has access to structures before adjunction, after adjunction, or both. Suppose, however, we set that question aside as well for the time being, and consider the system as it would apply to bracketed output representations, and assuming that en-searching may operate from the most deeply embedded constituent up, and taking every bracketed string as its potential input. By way of a concrete illustration, consider now the assignment of Content to *activism* and to *naturalize* (and with spellouts of C-functors as superscripts), neither, presumably, containing any ExP-segments when compositional or non-compositional:

(72a) \[ N_{[A]}^\{C=V\}^\pi\text{ACT} \quad C_{A[v]}^\{\pi\text{-ive}\}^\pi\text{ism}^\text{ISM}_{N[A/N]}^\{\pi\text{-ism}\}\]

(72b) \[ V_{[N]}^\{C=V\}^\pi\text{NAT} \quad C_{N[v]}^\{\pi\text{-ure}\}^\pi\text{al}^\text{ISM}_{A[N]}^\{\pi\text{-ism}\}\]

In *activism*, and assuming it to have the (derived) structure in (72a), an en-search may pick, as its smallest possible domain, that of \([C=V]^\pi\text{ACT}\). As such, it is an appropriate target for an en-search and can be matched with the atomic Content ACT, roughly a synonym of DO. Once such Content has been assigned to \([C=V]^\pi\text{ACT}\), and assuming that Content cannot be overridden, no additional en-searches are possible, because no other domain, as such, is a C-core. The reading that therefore must emerge for the expression as a whole is a compositional one, with \(C_{N[v]}^\{\pi\text{-ive}\}\) and ISM\(_{N[A/N]}^\{\pi\text{-ism}\}\) contributing whatever formal properties they may stand for by virtue of being C-functors. Such composition, note, cannot possibly

---

37 Note that while \(\pi\text{-ive}\) is a spellout of a “generalized” \(C_{A[v]}^\pi\text{ism}\) functor, \(\pi\text{ism}; \pi\text{ist}\) in all likelihood spell out a semantically meaningful C-functor. In fact, it may very well turn out that the best way to analyze the relationship between \(\pi\text{ism}\) and \(\pi\text{ist}\) (in its adjectival instantiation) would be by postulating two portmanteau morphs consisting of IS- + a distinct realization as m/ist contingent on the categorial nature of the relevant functor. The shared semantic value, in this case, would clearly be that associated with IS, and hence IS\(_{N[A/N]}^\pi\text{ism}\). ISM is nonetheless used in the text discussion for expositional reasons. See fn. 41 of Chapter 7 for some brief comments on this issue.

38 And note that this excludes, in principle, the matching of Content with C-functors, as noted already in fn. 20.
proceed in PF as such where neither the syntactic nor the semantic properties of functors, if they have them, are “interpretable”, but rather proceeds in parallel, on the basis of the syntactico-semantic representation and without the Content (and I return in section 6 of Chapter 10 to the specific workings of such a composition).

Suppose now that by virtue of the optionality of Content matching, en-searching for \([\lambda_{C=V} \pi \sqrt{\text{ACT}}]\) is withheld, and the next possible domain is en-searched in its stead, i.e. \([\lambda_{C=V} \pi \sqrt{\text{ACT}}] C_{N[V]}^{/\pi \text{-ive}}\). As it turns out, however, there is no atomic Content unit that corresponds to \([\lambda_{C=V} \pi \sqrt{\text{ACT}}] C_{N[V]}^{/\pi \text{-ive}}\). An en-search thus returns no atomic Content, which is to say that only compositional Content is associated with English active, and the only reading available is that which composes the Content of \([\lambda_{C=V} \pi \sqrt{\text{ACT}}]\) with \(C_{N[V]}^{/\pi \text{-ive}}\).39

Finally, and again by virtue of the optionality built into Content matching, en-searching may pick as well \([\lambda_{C=V} \pi \sqrt{\text{ACT}}] C_{N[V]}^{/\pi \text{-ive}}] \text{ISM}_{N[A/N]}^{/\pi \text{-ism}}\) in its entirety. For that, English does have an atomic Content item, and the Content returned would be roughly that of IDEOLOGICAL MILITANCY.

Note now that importantly, the formal functions of both \(C_{N[V]}^{/\pi \text{-ive}}\) and \(\text{ISM}_{N[A/N]}^{/\pi \text{-ism}}\) are not pre-empted. The categorial structure as well as the transitivity of the C-functors is preserved, as well as the categorical nature of the CCS, to the extent that such determination is possible in non-compositional contexts. Certainly, the semantic function of \(\text{ISM}_{N[A/N]}^{/\pi \text{-ism}}\) is maintained. By assumption, however, Content was never assigned to \([\lambda_{C=V} \pi \sqrt{\text{ACT}}]\) in isolation, and thus the Content of activism explicitly does not, at any point of its derivation, contain the Content ACT. As a consequence that Content need not be suppressed and coercion affects are neither expected nor attested.

Insofar as at least intuitively some residue of ACT may be deemed to have survived into ACTIVISM, the consideration of naturalize makes it clear that any such residual Content is not in the least necessary. It is thus entirely clear that any Content conventionally assigned to nature in isolation (say NATURE) is lost in (non-compositional) naturalize (BECOME-CITIZEN). Following a very similar logic, we note that the first possible en-searching for naturalize would presumably pick \([\lambda_{C=V} \pi \sqrt{\text{NAT}}]\) (rendered V-equivalent by merging with \(C_{N[V]}^{/\pi \text{-ire}}\); if an instance of \(C_{N[V]}^{/\pi \text{-ire}}\); see fn. 28 of Chapter 7 for some comments). English, however, does not have Content listing corresponding to \([\lambda_{C=V} \pi \sqrt{\text{NAT}}]\), and so that particular en-search would come out empty-handed. Importantly, the absence of Content corresponding to \([\lambda_{C=V} \pi \sqrt{\text{NAT}}]\) has, within this system, the same exact formal status as the absence of an atomic Content potentially corresponding to \([\lambda_{C=V} \pi \sqrt{\text{ACT}}] C_{N[V]}^{/\pi \text{-ive}}\]). Insofar as Content listing is, by assumption, costly, the absence of Content listing for a complex derivative is neither more nor less costly than the absence of Content listing for a mono-morph. Expanding the domain,

39 In turn, active may of course remain devoid of Content, by the very same optionality that allows slithy as a Content-less item. I submit that this is in fact the case and that the appearance of universal Content for active or for any other potentially meaningful phonological string emerges directly from the fact that Content if available, is pragmatically so much more salient than absence of Content, that favoring the latter can only emerge in rather contrived (but clearly imaginable) situations. See section 9.3.4 for additional brief comments on this issue.
the next en-search would return the Content \( NATURE \) for \( [\text{IN}_{\left[C=\pi\sqrt{\text{NAT}}\right]} \text{C}_{\text{N}[v]}^{/\pi\text{-urel}]} \) in a rather straightforward way.

Whether or not natural is always compositional, and whether, e.g., the fifteen definitions for its adjectival use that are listed in the Merriam-Webster online dictionary amount to cases of individual atomic Content, is a matter which it is legitimate to leave aside here.\(^{40}\) What is however beyond dispute is that the specific listed Content of naturalize as in BECOME-CITIZEN does not derive in a compositional fashion from any of the conventionally available Contents of natural. Rather, it emerges from an en-search conducted on the representation \( [\text{VIA}_{\left[C=\pi\sqrt{\text{NAT}}\right]} \text{C}_{\text{N}[v]}^{/\pi\text{-all}]} \text{C}_{\text{A}[\pi/\text{ize}]} \) as a whole, for which it returns Content that retains none of those that would be assigned, in isolation, to either nature or natural. Finally, note, naturalize is, of course, ambiguous, as it also allows a fully compositional Content (from NATURE up as well as from NATURAL up). As an obvious restriction, note, we must exclude the string naturalise from being en-searched multiple times within a single derivation, so as to block the existence, for naturalize, of a Content set which includes all of its possible Contents simultaneously within a single derivation.

The application of the system to R-nominals is of course no different. The R-nominals civilization or globalization with their compositional and non-compositional Content would progress as in (73). Note that both globe and civil have multiple Contents which naturally allow for multiple compositional Contents for global and civilize. Nonetheless I will be assuming that e.g. the Content COMPREHENSIVE, when associated with global, is non-compositional, as is the Content ADVANCE when associated with civilize. I will further assume, for expository purposes, that the root of civilize is \( ^{\pi}\text{CIVIL} \) rather than \( ^{\pi}\text{CIV} \), as occurring identically in e.g. civic. The representation of C-functors below is simplified in obvious ways for ease of exposition):\(^{41}\)

\[
\begin{array}{ll}
\text{en-search} & \text{Content} \\
\hline
\text{i. } [\text{IN}^{\pi\sqrt{\text{GLOB}}}] & \text{GLOB} \\
\text{ii. } [\text{IN}^{\pi\sqrt{\text{GLOB}}}][\text{al}] & \text{GLOBAL} \quad \text{GLOB (+al)} \\
\text{iii. } [\text{VIA}^{\pi\sqrt{\text{GLOB}}}][\text{al}][\text{ize}] & \text{no Content on file} \quad \text{GLOBAL (+al +ize); GLOBAL (+ize)} \\
\text{iv. } [\text{IN}^{\pi\sqrt{\text{GLOB}}}][\text{al}] & \text{GLOBALIZATION GLOB (+al +ize +ation);} \\
& \text{GLOBAL (+ize +ation)}
\end{array}
\]

\(^{40}\) Insofar as “Content”, by assumption, involves extra-linguistic systems, and insofar as a rigorous model of concepts and conceptualization is still very much outside our reach, the discussion, by and large, is restricted to cases where non-compositionality is reasonably straightforward and as based on listed Content that is clearly available to speakers (e.g., excluding historically relevant but synchronically or sociolinguistically obscure vocabulary). No attempt is made here or elsewhere in this volume to construct a theory of Content that would be able to predict what should be classified as a metaphor or a simile, what should be classified as arbitrary listing, and what should be classified as a natural progression of Content.

\(^{41}\) The choice of globalization as an example is determined by the fact that it is very complex, that it allows atomic Content, and that it is possible, with compositional Content, as an AS-nominal. One might nonetheless dispute the non-compositional nature of globalization, arguing that it denotes no more than rendering international various facets of modern existence, and as such is a direct derivative of global \( \rightarrow \) globalize. While that is certainly a use of globalization in which it means roughly the same as the nominal globalizing, globalization has also been used in a considerably narrower sense to refer specifically to the internationalization of capital. That Content is not available for the source verb globalize, nor is the form attested, with that Content, as an AS-nominal. Globalizing (e.g. in the R-nominal use this kind of globalizing) cannot be used in that context. For a useful discussion of the term and its various uses, see <http://www.infed.org/biblio/globalization.htm>. If nothing else, the article is notable for the total absence of the verb globalize or globalizing in the relevant sense, alongside dozens of uses of both globalization and global (and two uses of globalized as an adjective).
Before moving to Content matching in compounds and to the resolution of the puzzles outlined in section 1, it is worth highlighting the fact that the matching of atomic Content to e.g. activism or naturalize is accomplished regardless of the fact that both activism and naturalize have an internal categorically marked structure. Specifically, \( [C=Vp \sqrt{\text{act}}] \) within activism, under its atomic reading, is every bit as “verbal” as \( [C=Vp \sqrt{\text{act}}] \) within to act; \( [N\text{nature}] \) is every bit as “nominal” within naturalize as it is within the nature and \( [A\text{[nature]al}] \) is just as “adjectival”. The absence of compositional Content for naturalize or activism, in other words, is not contingent on the absence of constituent structure or categorizing within them, or on the assumption that there is any difference between the categorial properties of nature when embedded within atomic or compositional naturalize. Syntactically, the configurations are identical. Insofar as the syntactic domain for Content matching is only mindful of ExP-segments, there is simply no need to assign distinct syntactic structure to such phrases, and the simplest assumption, namely that they are syntactically identical, can be maintained.

9.3.3 Content assignment—compounds

Consider now the assignment of Content, compositional or atomic, in compounds, and taking the key property of compounds to involve the existence of two distinct C-cores. With the aim of focusing on the workings of the system, the discussion is restricted to English N+N and A+N primary, endocentric compounds which adhere to the English Compound Stress rule, i.e., in which the head is N or N-equivalent and is on the right, and the stress is on the non-head constituent. Very schematically, then, what is under consideration are configurations such as those in (74):

\[ a. \quad (\text{the}) \quad [C=N_1 \quad [C=N_2 \quad \sqrt{\text{root2}} \quad \sqrt{\text{root1}}] \quad (\text{will}) \quad [C=N_1 \quad [C=N_2 \quad \sqrt{\text{root2}} \quad \sqrt{\text{root1}}] \quad \text{black} \quad \text{board} \quad \text{chicken} \quad \text{wire} \]

42 While the discussion here is restricted to forms which obey the English Compound Stress rule, it is by no means clear that all English compounds obey that rule, or that there is a correlation between compositionality (or lack thereof) and adherence to the Compound Stress rule. More generally, I assume that when the head of the compound is itself an otherwise category-less root, the compound as a whole is contextually rendered categorically equivalent by the dominating Extended Projection (e.g. chicken wire), and specifically, that the relevant categorial equivalence comes to be associated with the head of the compound (see Chapter 7, section 3 for discussion). On the categorization of the non-head, see Chapter 6, fns. 9 and 48, where it is proposed that a special categorization scheme, the Compound Frame, is responsible for rendering the non-head N/A-equivalent, or, potentially, +N. Note that insofar as the distinction between N and A seems inert in such cases, this tallies with the observation already made in Chapter 7, sections 5 and 6 on the frequent structural ambiguity of A/N categorization both in terms of projecting and in terms of CCS selection.
Arguably, all A+N compounds are non-compositional, insofar as e.g. being a *blackberry* is not contingent on being black, nor, for that matter, even of being *black for a berry*. Setting this matter aside, however, and wishing to preserve at least some Content distinction between e.g. *blackberry* and similar cases, which arguably, as a concept, does include blackness as one of its prototypical properties, and *blackboard*, which does not, suppose we assume that *blackberry* and similar cases are compositional, in the required sense. Within the area of N+N compounds, the boundaries between what is, arguably, compositional and what is clearly not are at least at times easier to establish. Thus in a relatively clear sense, *towel rack* is compositional, as is *kitchen towel rack* with both its readings, but not so *watershed*, or *firefly*, or *network*, under their canonical readings.

Consider now the matching of Content in compounds. Under the assumption that compounds, unlike derivatives, allow the embedding of a C-core within another C-core, the prediction is that such configurations should allow either a unified en-search picking the maximal C-core, or, alternatively, two distinct en-searches, each returning independent licit Content. In view of this, consider the assignment of Content to *towel rack*, and to *firefly*:

\[
\begin{align*}
\text{a. } & \left[ \text{N}_1 \text{ N}_2 \text{ N}_1 \right] \quad \text{towel rack; fireman; firefly; desk top; watershed; etc.} \\
\text{b. } & \left[ \text{N}_1 \text{ A} \text{ N} \right] \quad \text{blackboard; greenhouse; blackberry; strongman; etc.}
\end{align*}
\]

\[\text{(74)}\]

\[
\begin{align*}
\text{en-searches (domain boxed)} & \quad \text{Content and composition:} \\
\text{i. en-search 1} & \left[ \text{N}_1 \text{ N}_2 \text{ TOWEL} \right] \quad \text{KITCHEN} \quad \text{KITCHEN} \quad \text{+ TOWEL} \\
\text{ii. en-search 2} & \left[ \text{N}_1 \text{ N}_2 \text{ TOWEL} \right] \quad \text{KITCHEN} \quad \text{+ TOWEL} \\
\text{iii. unified en-search:} & \left[ \text{N}_1 \text{ N}_2 \text{ TOWEL} \right] \quad \text{KITCHEN} \quad \text{+ TOWEL}
\end{align*}
\]

\[
\begin{align*}
\text{en-searches} & \quad \text{Content and composition:} \\
\text{i. en-search 1} & \left[ \text{N}_1 \text{ N}_2 \text{ FLY} \right] \quad \text{FIRE} \quad \text{FIRE} \quad \text{+ FLY} \\
\text{ii. en-search 2} & \left[ \text{N}_1 \text{ N}_2 \text{ FLY} \right] \quad \text{FIRE} \quad \text{FIRE} \quad \text{+ FLY} \\
\text{iii. unified en-search:} & \left[ \text{N}_1 \text{ N}_2 \text{ FLY} \right] \quad \text{FIRE} \quad \text{FIRE}
\end{align*}
\]

*Firefly*, by this Content assignment procedure, is ambiguous, in returning both a single atomic Content unit for the entire compound, that of a particular insect, and in returning a compositional reading, associated with the matching of Content

\[\text{Firefly}, \text{ by this Content assignment procedure, is ambiguous, in returning both a single atomic Content unit for the entire compound, that of a particular insect, and in returning a compositional reading, associated with the matching of Content}\]

---

\[\text{43 Two caveats are in order concerning the exposition. Note that compounds are provided with (equivalent) categorial labels and en-searches are presumed to progress on the basis of such labeled constituents. Some doubt will be cast in section 5 of Chapter 10 on the need for such labels in compounds; the outcome of that discussion, however, is unlikely to affect the computation of Content as such.}\]

In another expository choice, en-searching is illustrated here, as in derivatives, based on post-adjunction structures. As I will argue below, however, every instance of Merge constitutes a phase, thereby requiring a certain fine-tuning of the relationship between phases, adjunction, and the domain of en-searching. Within the domain of derivatives and compounds, as we shall see, the empirical ramifications of such fine-tuning are minor, making this abstraction innocuous enough. See Chapter 10, sections 1-2 for some discussion of the phase execution as it is relevant to the adjunction structures under consideration here.
separately to fire and fly, and composing them, presumably, into something which is a fly to whom fire, with its straightforward Content, is relevant (a fly made of fire; a fly that lives in fire; a fly that is attracted to fire, etc.). We further get, in a straightforward way, the range of interpretations associated with e.g. kitchen towel rack vs. those associated with e.g. brush fire fly. Note finally that the output of the en-search that returns BRUSHFIRE cannot be combined with the output of the en-search that returns FIREFLY:

\[
\begin{array}{c}
\text{a. } \text{[[kitchen towel] rack]} \quad \text{[kitchen [towel rack]]} \\
\downarrow \quad \downarrow \quad \downarrow \quad \downarrow \\
\text{[[KITCHEN] TOWEL] RACK} \quad \text{KITCHEN} \quad \text{[[TOWEL] RACK]} \\
\hline
\text{b. } \text{[[brush fire] fly]} \quad \text{[brush [fire fly]]} \\
\downarrow \quad \downarrow \quad \downarrow \quad \downarrow \\
\text{[BRUSHFIRE FLY]} \quad \text{[BRUSH] FIREFLY} \\
\end{array}
\]

\*BRUSHFIRE FIREFLY

9.3.4 Resolving the puzzles: R-nominals vs. AS-nominals

Considerable space was devoted in section 9.1 to outlining two puzzles concerning the contrast between R-nominals and AS-nominals. The contrasts were such that it is hard to see how they can be resolved within the approaches to Content that were outlined in section 9.2 or, for that matter, within lexicalist approaches. The two puzzles are summarized in (77).

(77) a. AS-nominals must be compositional; R-nominals may be non-compositional.
   b. AS-nominals must involve an affixation to an actually attested verb; R-nominals need not.

   As it turns out, both puzzles simply vanish once it is assumed that ExP-segments define the domain of Content. The ensuing discussion is surprisingly short, especially in view of the lengthy exposition of the problems, precisely because the solutions emerge directly and smoothly from the system thus far outlined, requiring absolutely no additional apparatus. Recall, rather crucially, that the presence of ExP-segments within AS-nominals, but not within R-nominals was extensively motivated in this work (Chapters 2–5) by considerations that have nothing to do with compositionality or lack thereof; nor did the argumentation for ExP-segments inside AS-nominals rely on the necessary presence of an attested verb within them. Rather, the argument for the existence of ExP-segments within AS-nominals was based on purely syntactic and formal-semantic argumentation concerning constituent structure, case assignment, adverbial modification, event interpretation, and so on. In turn, and insofar as it emerges that complex structures which are independently motivated by the syntax have ramifications within a domain that is typically considered “lexical”, this, in and of itself, provides extremely strong evidence for the syntactic representation of complex words. Insofar as our system correctly predicts distinct morpho-phonological and Content effects for what are syntactically distinct but otherwise morpho-phonologically identical forms, this constitutes a sharp empirical advantage
for a syntactic treatment over a lexical one, as well as for the specific syntactic execution which gives rise to such correct results.

That AS-nominals contain ExP-segments but not so R-nominals already informed the preliminary hypothesis concerning the properties of en-searching in (69). The specific workings of en-searching and Content matching were further illustrated through the successful assignment of Content to *activism, *naturalize, and (R-nominals) *globalization and *civilization, all constituents that by assumption do not contain any ExP-segments and as a result, allow compositional as well as atomic Content with an identical syntactic structure. Consider, however, AS-nominals with the structures in (78) (see also (1), (3)):

(78) a. The transformation/transformation of the banking system (by the government)
   b. *The transformation of the structure by the linguist (technical use)
   c. \[ \text{CN[v]}/\text{INGN[v]} \]

\[
\begin{array}{l}
\text{CN[v]}/\text{INGN[v]} \\
\quad \text{E} \\
\quad \text{C} = \text{trans}^\pi \sqrt{\text{FORM}^Q}\end{array}
\]

At the core of the effect that we are attempting to account for, recall, is the fact that /transformation/, an otherwise perfectly phonologically licit expression in both its AS- and R- context, can have a non-compositional, atomic Content when an R-nominal, but not when an AS-nominal. When considering the AS-nominal tree in (78c) from this perspective, what becomes evident is that the absence of atomic Content for transformation derives directly and straightforwardly from the domain of en-searching as described in (69). Specifically, if ExP-segments block en-searching, it is clear that Content, in (78c), may only be assigned to \[ C = \text{trans}^\pi \sqrt{\text{FORM}^Q} \] (presumably TRANSFORM), and that any subsequent movement of \[ C = \text{trans}^\pi \sqrt{\text{FORM}^Q} \], including its eventual adjunction to \[ \text{CN[v]} \] or \[ \text{INGN[v]} \] involves the movement of an already Contented constituent. As Content cannot be overridden, the interpretation of \[ C = \text{trans}^\pi \sqrt{\text{FORM}^Q} \] with \[ \text{CN[v]} \] or with \[ \text{INGN[v]} \] must be composed of TRANSFORM in conjunction with whatever other information is provided by the functor, and cannot be assigned independent Content (e.g. as TRANSFORMATION in its technical linguistic sense).

We note now that while the C-core in (78) is trivial, this need not be the case. /editorialize/, as already noted, has a rather complex structure but nonetheless may have atomic Content. In turn, it may be mapped onto a structure such as (78c) entirely successfully, precisely because there is little to prevent /editorialize/ from being an input to en-searching, being fully contained within the C–core. In fact, and
insofar as atomic *editorialize*, *PONTIFICATE*, is at all possible this is exactly because it is a possible C-core, excluding ExP-segments. The prediction, of course, is that while *editorialize* might have atomic Content, embedding it within an AS-nominal would yield readings that are composed with *PONTIFICATE*. As a result, both *editorialization* and *editorializing* are licit AS-nominals, and as predicted both have a reading that emerges from composing the atomic Content of *editorialize* with whatever function is satisfied by ING or ATK:

(79) a. the frequent *editorialization/editorializing* by multiple self-proclaimed pundits in the wake of Margaret Thatcher’s death

![Diagram](image.png)

By contrast, we note, ExP-items (and specifically maximal brackets) are excluded within any constituent that has an atomic Content. It therefore follows that on their atomic Content reading, both *transformation* (TRANSFORMATION) and *civilization* (CULTURE, SOCIETY) may not include ExP-segments. In the absence of ExP-segments, however, event structure cannot emerge, and such nominals are perforce excluded from being AS-nominals.

As it turns out, the very same fact, i.e. the presence of ExP-segments within AS-nominals but not within R-nominals, also accounts for (77b). To see why this is the case, consider the existence of, e.g. *nation* as an R-nominal, but not as an AS-nominal, or, differently put, the presumed ungrammaticality of the structure in (80b):

(80) a. \[ C_{\pi=\sqrt{\text{NAT}}} \]

b. \[ C_{\pi=\sqrt{\text{NAT}}} \]

![Diagram](image.png)

We also noted that this need not be a problem, and that a broader en-search would nonetheless be capable of returning atomic Content for structures that include \[ C_{\pi=\sqrt{\text{NAT}}} \], for *NATURE*, or \[ C_{\pi=\sqrt{\text{NAT}}} \] for *NATIVE*. The assignment of Content would presumably proceed in an identical (formal) fashion (but with distinct Content), for \[ C_{\pi=\sqrt{\text{NAT}}} \], returning *NATION* (and see section 9.4 on deriving the different Content for *nature* and *nation* and similar cases).
Consider, however, the schematic AS-nominal in (80b). By assumption \([C=V\sqrt{\text{nat}}]\), verbalized here in the context of some ExP-segment, does not have Content. But any further en-searching seeking to match Content to some larger domain containing \([C=V\sqrt{\text{nat}}]\) perforce must fail. Specifically, because an en-search may not include ExP-segments there is simply no way to constitute an appropriate single en-search domain that includes both \([C=V\sqrt{\text{nat}}]\) and \(C_{N[V]/\text{nation}}\). The representation in (80b) is thus doomed to permanent Contentless-ness.

Viewed differently, recall that nothing in the system as outlined here actually makes Content obligatory. Not only are the cases in (81) (repeated from (40)) licit; so is the failure of Content to be matched with \([\sqrt{\text{nat}}]\) or for that matter with \([\text{civil}]]\), when the latter is embedded within non-compositional civilization (cf. 73):

(81) the slithy trees
   (the) sturd(s), (will) flim

By a similar logic, nothing in the system as outlined thus far excludes the structure in e.g. (82). By definition, the only potentially Contentful element in (82) is \([C=V\sqrt{\text{cept}}]\), which correlates with the C-core, but Content for \([C=V\sqrt{\text{cept}}]\), presumably, is not on file. Insofar as any anomaly is thus associated with (82b), it does not emerge from an illicit structure, but rather, is neither greater nor less than whatever anomaly is associated with Jabberwocky’s slithy toves or brillig:

(82) a. \([\text{NP} \ C_{N[V]}/\text{ING}_{N[V]} \ [\text{EP} \ [\text{ASPQ} \ [C=V\sqrt{\text{cept}}]]]]\]

b. the ception/cepting of the piano by the cats

When we now return to the impossibility of fiction, nation, or vision as AS-nominals, I submit that in actuality, they are perfectly licit as such. They are, however, doomed to be permanently Contentless in that context. \([C=V\sqrt{\text{fict}}]\), \([C=V\sqrt{\text{nat}}]\), and \([C=V\sqrt{\text{vis}}]\), as it happens, do not have Content on file. This is true when they occur in isolation, and is also true when they are embedded within a bigger constituent. Nation, fiction, and vision can be matched with Content, but only if they do not contain ExP-segments. Within an AS-nominal, nation, fiction, and vision must, however, contain ExP-segments. It therefore follows that the only possible Content domains in such cases consist of \([C=V\sqrt{\text{fict}}]\), \([C=V\sqrt{\text{nat}}]\), and \([C=V\sqrt{\text{vis}}]\), where, by assumption, independent Content is not available.

We note now that AS-nominals constructed with nation, fiction, and vision appear to be ungrammatical, rather than nonce forms. That this is the case, however, emerges directly from the plausible assumption that any pragmatic principle ensuring cooperative communication would make unlikely the dismissal of Content in favor of absence of sense, nonsense. The appearance of ungrammaticality thus emerges from whatever interference is created by the presence of Contentful fiction, nation, and vision under a derivation that excludes AS-nominals. Absent such interference, the presence of the Jabberwocky effect is patently visible, as (83) directly illustrates:
(83)  a. the nating of the kittens by the neighbor
     b. the ficting of the trees by the gardener
     c. the vising of the mountains by the traveler

9.3.4.1 R-nominals and AS-nominals—what do they share? Having proposed that the core difference between the properties of AS-nominals and R-nominals emerges, across the board, from the presence of ExP-segments within the former, but not within the latter, and having reduced both obligatory compositionality and the obligatoriness of attested V within AS-nominals to these very same factors, it is worthwhile pausing briefly to consider again what properties R-nominals and AS-nominals do have in common, lest we run the danger of making the morpho-phonological identity of /transformation/ (TRANSFORMATION) and /transformation/ (act of TRANSFORM-ing) a complete coincidence.

Recall now that the ExP-segments implicated in argument structure effectively render their Categorial Complement Space (CCS) either V-equivalent or A-equivalent (depending on the specific event structure under consideration). In fact, putting the matter even more strongly, I argued in Chapter 6 that Extended Projections are sets defined precisely on their shared CCS. It therefore follows that whatever node merges with the lowest such ExP-segment, be it a phonological index or a category-bearing derivative, perforce becomes either V-equivalent or A-equivalent. This, we note, is entirely independent of the fact that in AS-nominals and S-nominals (in the sense of Roy 2009) the argument structure under consideration is further embedded under a C-functor, C_N[V] or C_N[A], which itself defines its CCS as either V- or A-equivalent. In turn, it is the latter property, rather than the former, which AS-nominals share with the morpho-phonologically identical R-nominals, as in R-nominals there is no “verbalizing” or “adjectivizing” argument structure nor are there arguments or event properties. In R-nominals, then, it is the C-functor which directly renders the C-core V- or A-equivalent. In AS-nominals, on the other hand, the C-core is rendered V- or A-equivalent by the Extended Projection, which, in turn, is dominated by a C-functor which turns out to have an identical CCS. Could this correlation be a coincidence?

That argument structure creates a V-equivalent or an A-equivalent environment, and that there should also exist C_N[V] functors and C_N[A] functors is, in itself, neither surprising nor particularly interesting. In turn, the co-occurrence of precisely these two properties in the same nominal phrase is anything but a coincidence, nor is it a trivial result. We note, specifically, that it is exactly C_N[V] functors that may embed (Ex[V]) and it is exactly C_N[A] functors which may embed (Ex[A]), and that there exist no other cases—there are no occurrences of “adjectivizing” Extended Projections embedded under ING or ATK, and there are no cases of “verbalizing” Extended Projections embedded under C_N[A] affixal realizations such as /ness/ or /ity/. There must be, then, principled reasons for the fact that it is precisely the Extended Projection that creates a V-equivalent environment that can be embedded under C_N[V], and that it is precisely the Extended Projection that creates an A-equivalent environment that can be embedded under C_N[A].
Recall now that the only way in which $C_{N[V]}$ can satisfy its transitive function is in the presence of a V or V-equivalent CCS. The only way in which $C_{N[A]}$ can satisfy its transitive function is in the presence of an A or A-equivalent CCS. As we already noted, such a V- or A-equivalent node can either be a derivative (e.g. in verbalize-ation or transitive-ity), or a category-less root, rendered V- (or A-) equivalent in the context of $C_{N[V]}$/$C_{N[A]}$.44 I further noted (in Chapter 6, section 3) that the movement of V or A so as to adjoin to $C_{N[V]}$/$C_{N[A]}$ is precisely so as to allow $C_{N[V]}$/$C_{N[A]}$ to satisfy their transitive function (and thereby to also create a licit C-core), and that insofar as the C-functor under consideration has V or A as its CCS, movement from within an embedded ExP could only be licit if the ExP under consideration is itself a verbalizer or an adjectivizer respectively. That R-nominals and AS-nominals avail themselves of the same C-functors, then, is anything but a coincidence. Rather, it follows from the function of the relevant C-functor that it would either select a V/A equivalent CCS directly, or a constituent that may itself be a verbalizer/adjectivizer, and with the latter case requiring movement.

In section 9.4 as well as in Chapter 10 I turn specifically to the commonality of phonological effects attested in the context of R-nominals and AS-nominals, showing these likewise to follow directly from those aspects of structure which R-nominals and AS-nominals share.

9.3.5 A brief summary

At the risk of overstating this point, we note yet again, that what is at issue here is clearly neither the degree of complexity of the emerging structure, nor the specific nature of the C-functors involved. Rather, what appears to be the deciding factor is the fact that atomic Content cannot be assigned across ExP-items (under some formulation). Insofar as complexity is not, indeed, the issue, we note that we can now also derive in an entirely straightforward fashion the observation in section 9.2.1. Because the domain of Content excludes ExP-items, the occurrence of the first such ExP-item becomes the final outer bound for Content matching. That the cases in (84) (repeated from (40)) are doomed to permanent Contentless-ness now follows directly from the fact that, being dominated directly by the Extended Projection, they have missed their final chance to integrate with larger units which may have given rise to a licit single successful en-search:

(84) the slithy doves permanently Contentless
    (the) sturd(s), (will) flim permanently Contentless

44 But see Chapter 7, section 6 on the possibility that contextual categorization never applies to adjectives, and that the latter are inherently categorial.
We note finally that excluding ExP-items from the domain of en-searching yields directly the result that inflectional marking (e.g. tense and modals) and S-functors (e.g. determiners) cannot affect Content. The observation is of course hardly new. What is however significant is the fact that this observation is traditionally at the heart of the claim that C-functors should be excluded from the syntax and relegated to some autonomous component of word formation. And yet, a formal syntactic distinction between Extended Projections and whatever C-domain is embedded within them is made within virtually all present syntactic models, allowing for a straightforward modeling of the difference between C-functors and “functional structure” within the syntax. Specifically, by utilizing notions such as Extended Projection and a C-core which are syntactically independently motivated, it is possible to define syntactically a domain which allows for the modification of Content. Once such a domain is deterministically defined, however, any argument for an autonomous lexicon or an autonomous morphological component which is based on Content matching becomes irrelevant.45

More specifically, I concluded that roots, as such, do not have Content. Insofar as categorized, mono-morphemic strings such as cake or govern are matched with Content, such matching does not stem from some Content inherently associated with \( ^*_\text{CAKE} \) or \( ^*_\text{GOVERN} \), but rather is accomplished at the very same time and in the very same way that Content is matched, compositionally or non-compositionally, to \([_n \text{ fruit cake} ]\) or to \([_n \text{ government} ]\). Insofar as fruitcake and government can have a compositional reading based on the Content of govern, fruit, and cake, this signifies the existence, within each, of the constituents \([_c \text{ cake} ]\), \([_c \text{ fruit} ]\), or \([_c \text{ govern} ]\) respectively, as well as the fact that these constituents can be matched independently with Content, as would be the case for a cake or to govern. Insofar as government and fruitcake are matched with an atomic Content unit, such matching is blind to whatever Content \([_c \text{ cake} ]\) or \([_c \text{ govern} ]\) would have had on their own—neither CAKE nor GOVERN are thus present in the atomic Content of GOVERNMENT and FRUITCAKE, and thus need not be eliminated for the appropriate atomic Content of fruitcake or government to emerge. Insofar as one could deem there to be some Content relatedness between GOVERNMENT (as a structured national leadership) and GOVERN (as in to govern or as in e.g. governance or the compositional reading of government), under the present account such relatedness has no grammatical status. Insofar as statistical correlations are cognitively recorded, the occurrence of /govern/ in multiple conceptually related contexts in which it is assigned the Content GOVERN is no doubt responsible for the overall impression as well as the expectation, however represented, that the relevant string would have similar Content across its occurrences. At the risk of repeating the point, that expectation, however otherwise cognitively real, is not part of the specifically

45 Plural marking, on record as impacting Content in pluralia tantum as well as, potentially, in compounds, comes to mind immediately as a potential problem. The matter will be taken up again in section 3 of Chapter 10.
grammatical properties of $\pi\sqrt{\text{GOVERN}}$ any more or less than the property of being eccentric is a grammatical property of baked goods of any sort.\footnote{The point is less facetious than it appears, precisely because the emergence of the non-compositional Content for fruitcake can be traced back directly to the previously existing identical Content of nut and nutty. The Content evolution from nutty to fruitcake may not be deterministic, but it is also not particularly hard to trace, the latter being a form of superlative of the former ("lots and lots of nuts, a virtual fruitcake"). What this demonstrates, however, is a method of Content evolution which should be of relevance to the study of conceptualizing and to the construction of conceptual networks but which is clearly outside the domain of grammar (and see in particular Lakoff 1987 for relevant investigations).}

9.3.6 A phase-based execution—preliminary motivation and emerging queries

An important point that needs to be highlighted concerns specifically the calculation of Content on the basis of the structures in (78)–(79). Given the specific treatment of Extended Projections and head movement utilized in this work, and in particular, the assumption that e.g. a verb re-merges and projects as it moves up the ExP-ladder and that it does so without acquiring additional structural complexity, it is clear that excluding ExP-items from the domain of Content can only be defined within a derivational approach, and cannot be captured within a representational approach. To see that this is the case, consider again the structure in e.g. (78) and focusing now on the “top of the tree”, and specifically on the boxed constituent in (85):

(85) \[
\begin{array}{c}
C\text{\_N[v]/ING\text{\_N[v]}} \\
E \\
C\text{\_N[v]/ING\text{\_N[v]}} \\
[\text{C=V trans}\sqrt{\text{FORM}^{(2)}}] C\text{\_N[v]/ING\text{\_N[v]}}
\end{array}
\]

As is patently evident, and as emerges directly from the specific execution of head movement within Extended Projections, the boxed constituent in (85) contains no internal ExP-segments or brackets. Within a representational approach, then, there would be little reason to distinguish the boxed constituent in such cases from the boxed constituent in (86), by assumption an R-nominal, with the unfortunate result that the emergence of non-compositional Content in the latter but not in the former would remain unexplained:

(86) \[
\begin{array}{c}
C\text{\_N[v]/\pi-ation/} \\
[\text{C=V trans}\sqrt{\text{FORM}}] C\text{\_N[v]/\pi-ation/}
\end{array}
\]
It thus emerges that we must assume a derivation-based execution, and that at the very least, we must assume that at the merger of the first ExP-item, the representation, as it exists at that point, gets its final chance to be matched with Content. Differently put, the merger of such an ExP-item defines a phase for Content matching. Once a phase-based execution is adopted, however, we must return to the structure of complex derivatives such as transformation, activism, and naturalize, and reformulate the exact workings of Content matching. To wit, consider transformation with its compositional and atomic Content respectively. The representational execution outlined in section 9.3.2 focused on a structure very much like (87b), and with the assumption that within such a structure, Content can be matched either with box ➀ (to yield TRANSFORM) or with box ➁ (to yield TRANSFORMATION). Under a phase-based execution, however, we must ask what, if any, are the phases internal to (87a), and how Content is matched with them. For instance, does box ➀ constitute a phase? Does box ➁? Or do both? Similarly, within a phase-based execution, we must ask what the phases are such that they are relevant to Content matching and en-searching relative to the structure in (87b). For instance, is the boxed copy ➊ still en-searchable, or is such en-searching excluded in a phase-based execution? And then, within the adjoined structure, could box ➀ be matched with Content separately from box ➃? And finally, can Content be matched with box ➁ in (87b), such that it is distinct from the Content matched with box ➃ by virtue of the presence of the copy ➊ in box ➂, but not in box ➃? (the specific phonological realization of the C-functor marked as superscript):

(87) a. C_{N[V]}^{\pi-ation/}

b. C_{N[V]}^{\pi-ation/}

As is already clear from the representations for simple, bi-morphemic structures, converging on the correct execution is by no means a trivial matter. Once we move to activism or naturalize with the structures in (88a–b) matters become even more complex. Thus for an atomic Content to emerge for these configurations, a constituent must exist such that it includes $\pi_{\sqrt{ACT}}$, $C_{N[V]}^{\pi-ive}$ and ISM$_{N[N/A]}$ (likewise, $\pi_{\sqrt{NAT}}$, $C_{N[V]}^{\pi-arel}$, $C_{N[N]}^{\pi-all}$, and $C_{V[N/A]}^{\pi-ize}$ for naturalize), and that it can be an appropriate target for en-searching. While there are certainly such constituents in (88a–b) (circled), all qualifying constituents also contain silent copies. What is the status of such silent copies, however? Are they allowed to impact Content? Do they have Content?
Finally, and insofar as a phase-based execution is forced by the specific view of head movement outlined here as it applies to (85), and in particular by the claim that such movement does not give rise to an increase in syntactic complexity of the verb adjoining to $C_N[v]$ within the circled constituent in (85), can any evidence be provided for the validity of that structure from the properties of that adjunction?

As we shall see, an answer to these questions, as well as considerable support for a phase-based execution and for the notion of head movement as depicted in (85), emerges when we integrate the domain of Content with domains of spellout. In section 9.4 I consider in detail the interaction of spellout and Content. The conclusions reached are in turn built into the specific phase-based execution outlined in Chapter 10.

9.4 Content and Spellout

9.4.1 The issues

Equipped with some encouraging results concerning our characterization of the domain of en-searching and Content matching, suppose we attempt to make the actual input into en-searching better defined. Specifically, I proposed in (69) that en-searching operates on bracketed and potentially labeled strings. However, it remains rather unclear at what point en-searching accesses those strings. Under the
assumption that the relevant strings represent output(s) of Merge, several possibilities present themselves. The first would have en-searching, and encyclopedic Content available on the basis of LF representations, where by LF representations I mean representations which are fully syntactically articulated and which contain interpretational information pertaining to structure and functors, but which are devoid of phonological information of any sort. If one perceives LF as the grammatical component solely engaged in the assignment of (broad) meaning, or as the sole input to the Conceptual/Intensional interface, that would certainly encourage an execution in which it is, indeed, LF representations which are being en-searched and which thus return Content. The second possibility would be to assume that en-searching, and hence Content, is based on phonological strings, which is to say on phonologically articulated bracketed representations. We note at this point that the existence of bracketed and even categorially labeled representations in PF is hardly surprising and is essential, in fact, as it clearly serves as input to intonation and prosody, and frequently to stress assignment and to the choice of allomorph. Thus, for instance, the full phonological realization of roots in the context of inflection frequently requires access to labeled brackets (/pran/, but only if \([C=V^{\text{run}}}]\); /prógress/ but only if \([C=N^{\text{pro}}^{\text{gress}}}]\); etc.). Finally, we may consider the possibility that en-searching accesses a point of the derivation which precedes the LF–PF split. In such a case, note, neither LF representations nor phonological representations are expected to have any impact on Content, although Content may affect LF as well as spellout.

While all this may appear enormously abstract, there are, in actuality, rather concrete predictions that emerge from each one of these executions, and which are summarized in (89):

(89) \[ a. \text{en-searching at LF:} \]
\[ \text{Spellout cannot impact Content} \]
\[ \text{Content cannot impact spellout} \]
\[ \left[ \begin{array}{c} \text{Content may impact formal semantic processes} \\ \text{Semantic processes may impact Content} \end{array} \right] \]
\[ \text{Phonologically null elements can have Content (including but not limited to silent copies, PRO, pro, elided constituents, etc.)} \]

\[ b. \text{en-searching at spellout:} \]
\[ \text{Content may not impact formal semantic processes} \]
\[ \text{Semantic processes may not impact Content} \]
\[ \left[ \begin{array}{c} \text{Spellout may impact Content} \\ \text{Content may impact spellout} \end{array} \right] \]
\[ \text{Phonologically null elements do not have Content} \]

\[ c. \text{en-searching at phase boundary (i.e. at Narrow Syntax split-off point):} \]
\[ \text{Content is available both at LF and at spellout} \]
\[ \text{Content may impact formal semantic processes} \]
\[ \text{Semantic processes may not impact Content} \]
\[ \text{Content may impact spellout} \]
\[ \text{Spellout may not impact Content} \]
\[ \text{Phonologically null elements may have Content} \]

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Note, before proceeding, relative to the bracketed options in (89a, b), that, for example, the question of whether semantics impacts Content or the other way around, or whether spellout impacts Content or the other way around must be independently determined for these executions, as any such interaction would be wholly within LF or wholly within PF, and thus must be contingent on properties internal to such modules. By contrast, if option (89c) is the correct one, it mandates that spellout as well as semantics, to the extent that they interact with Content, may only be affected by it, and may not impact it.

As it turns out, it can be shown directly that Content assignment does interact with spellout, with the consequences that possibility (89a) can be summarily excluded. Thus consider the cases in (90)–(93), already discussed in a different context in Chapter 6, section 2.5. Specifically, I noted there that while the default spellout for C_{n[v]} is /s{ation}/ (in suffixed contexts), all spellout variants of C_{n[v]} may be locally root selected, and quite frequently may co-occur (albeit possibly not in the same idiolect) with the same (prefixed) root. Some of these cases are illustrated below (all examples corpus-based and selected specifically with the aim of creating contrasts as minimal as possible):

(90)  a. the selective transmission of historical documents
b. scanning and transmittal of documents or parts of documents
c. a camera system for processing documents for measurement of reflectance and/or transmittance of documents

(91)  a. request for deferment of loan repayment
b. The department shall grant a deferral of interest and principal payments.

(92)  a. Several groups . . . monitor the sale and transportation of seed.
b. the transportal of seeds in the wool or fur of quadrupeds

(93)  a. the slight transference of red pigments from the skins
b. transferal of bread “spoon” from dough mixer to trough prior to fermentation

For at least some of the italicized derived nominals in (90)–(93), there exist well-established correlates with atomic Content. Across the board, however, such Content is specifically available for only one of the variants, in spite of the fact that in compositional contexts, the forms may be interchangeable, and any choice between them is, at best, a matter of register, jargon, or personal background. This state of affairs is illustrated in (94), with forms allowing atomic Content in bold:47

(94)  a. public transportation TRANSPORTATION the car’s transmission GEARBOX
b. *public transportal  *the car’s transmittal
   *the car’s transmittance

47 Note that transport, by assumption with the structure \([\text{C=N}^{trans}^v[PORT]]\), does allow Content identical to PUBLIC TRANSPORTATION, but not so transportal, further bolstering our claim that actual phonological realization is crucial to Content.
a. Understanding *transference* and counter *transference* TRANSFERENCE

b. *Understanding transferal and counter transferal*

By assumption, LF representations are blind to phonological information. The relevant LF representation for *transmission* and *transmittal* is thus identical, and is e.g. as in (96a) or possibly as (96b), depending on how visible phonological indices, as abstractions, are in LF:

\[
(96) \begin{align*}
\text{a. } & [N_{C=V} C_{N[V]}] \\
\text{b. } & [N_{C=V} pfx \sqrt{\text{root}} C_{N[V]}]
\end{align*}
\]

Note specifically that even if we were to assume that the specific phonological index of roots is visible in LF, as well as the information that some prefix is in place as in (96b) (both hardly obvious moves), allowing LF to see the root index would be effectively useless, given the fact that the root is identical in compositional and non-compositional instantiations. In turn, the input to spellout, under such an execution, could not be related to Content in any way. Just as LF would be unable to link the non-compositional Content to the correct phonological realization, so PF would be unable to have the information necessary to determine the pronunciation of GEARBOX as /p\*transmission/ but not as /p\*transmittal/ as by assumption, the GEARBOX Content (or any Content) would not be available in PF. Altogether, then, if Content matching is wholly within LF, the fact that *transmission*, but not *transmittal*, may have atomic Content could not be captured.\(^{48}\)

I therefore conclude that en-searching cannot take as its input (exclusively) LF strings. Turning now to the choice between (89b) and (89c), we note that in both it is possible to state the relationship between spellout and Content, and thus, at least in principle, both are compatible with the picture in (90)–(94). They do differ in their predictions, however, along two important lines. Because (89c) allows Content to be visible both at spellout and at LF, choosing that option would lead to the prediction that Content should be able to impact formal semantics, and that phonologically null elements could have Content. Secondly, (89c) predicts that, to the extent that Content interacts with spellout, interaction flows from Content to spellout rather than the other way around; or in other words, it is Content that determines phonological realization rather than the other way around. Specifically, it is the matching of the Content GEARBOX to an otherwise phonologically underspecified representation that would influence the specific phonological realization of \(C_{N[V]}\) as

\(^{48}\) It would be unhelpful, note, to argue for diverse semantics for *-ation* and *-al*, and hence for replacing (89) with (i) (but see Embick and Marantz 2008 for a tentative claim along such lines):

\[
(95) \begin{align*}
\text{a. } & [N_{C=V} pfx \sqrt{\text{root}} A T I O N_{N[V]}] \\
\text{b. } & [N_{C=V} pfx \sqrt{\text{root}} A L_{N[V]}]
\end{align*}
\]

The move, in addition to having to explain away the synonyms in (90)–(93), would also summarily fail to capture the relevant Content facts precisely because it is hard to see how any putatively distinct semantics for *-ation* and *-al* might lead to the availability of the specific atomic Content GEARBOX for *transmission*, but not for *transmittal.*
rather than /\_
\_ion/, as depicted in (97a) (or possibly as in (97b) depending on the availability or lack thereof of prefix identity prior to phonological realization):

\[(97) \quad \begin{align*}
\text{a. } [\_ [C=V \text{ pfx } \pi \sqrt{\text{mit}} C_{N[V]}] & \rightarrow \text{CAR GEARBOX} \quad [\_ [C=V \text{ trans } \pi \sqrt{\text{mit}}] \_\_ion/]
\text{b. } [\_ [C=V \text{ trans } \pi \sqrt{\text{mit}}] C_{N[V]}] & \rightarrow \text{CAR GEARBOX} \quad [\_ [C=V \text{ trans } \pi \sqrt{\text{mit}}] \_\_ion/]
\end{align*}\]

Finally, (89b), but no other execution, allows en-searching to operate on the basis of actually spelled out strings and as based on the actual realization of C-func-
tors. That particular scenario can thus be schematized as either (98a) or, note, (98b). Specifically, we already know that the choice of realization for C-functors interacts with Content. On the other hand, we have little reason to believe that the actual spellout of the root—beyond whatever is available through its phonological index—
affects Content as such. As a result, either representation appears, prima facie, adequate:49

\[(98) \quad \begin{align*}
\text{a. } [\_ [C=V \text{ trans } \pi \sqrt{\text{mit}}] C_{N[V]}] & \rightarrow [\_ [C=V \_\_transmiss/\_\_ion/]] \rightarrow \text{CAR GEARBOX}
\text{b. } [\_ [C=V \text{ trans } \pi \sqrt{\text{mit}}] C_{N[V]}] & \rightarrow [\_ [C=V \text{ trans } \pi \sqrt{\text{mit}}] \_\_ion/]
\end{align*}\]

I return in section 3 of Chapter 10 to reasons for preferring the execution in (98b), setting this matter aside for the time being. When considering now (97) and either version in (98), I will proceed to show that (97) cannot possibly be the correct way to go about the relationship between Content and spellout. Having excluded (89a) already, the (forthcoming) exclusion of the derivational contingency in (97) will amount to the exclusion of (89c) as well, thereby leaving us with the conclusion that en-searching and Content matching are based on bracketed phonological strings. In turn, the consequences would be as articulated in (89b), or more sharply:

\[(99) \quad \begin{align*}
\text{a. Content impacts neither syntactic nor semantic structures}
\text{b. Content cannot impact spellout}
\text{c. Spellout may impact Content}
\text{d. Phonologically null elements—silent copies, elided constituents, PRO, pro, etc. do not have Content.}
\end{align*}\]

We note before proceeding that at least some of the conclusions in (99) are prima facie extremely attractive. That Content impacts neither syntactic nor semantic structures is, in actuality, one of the central premises of XSM, and multiple arguments have been mounted to that effect both here and in Borer (2005a, b). The

49 The formal properties of Vocabulary Insertion (e.g. in Halle and Marantz 1993) involve providing an abstract morpheme with an insertion context, the latter potentially including roots. As such, Vocabulary Insertion is not formally identical to functor spellout as depicted here, which involves reference to root-contained information. Nonetheless, within the domain of C-functor spellout, it is not clear that the formal distinction gives rise to significantly distinct empirical predictions. (Not so, however, within the domain of “inflection”. See Chapter 1 for discussion.) For the competing representations in (98), then, this would amount to Content after Vocabulary Insertion but before full root spellout, as opposed to Content after both Vocabulary Insertion and full root spellout. The arguments to be mounted in Chapter 10, section 3 as well as in Chapter 11 for the execution in (98b) would thus be equally applicable to an account based on Vocabulary Insertion.
conclusion that Content is not even available at either (narrow) syntax or semantics is not only consistent with this aim, but if independently motivated, bolsters it considerably. Turning to the Content, or lack thereof, of phonologically null constituents, this, too, is an extremely positive result. Crucially, in the case of elements such as PRO and pro, this predicts that whatever interpretation they might be associated with emerges exclusively from properties of nominal ExP-segments, and in all likelihood, D and whatever S-functor assigns range to it. That pronominals, overt or covert, must be species of functional structure, on the other hand, can be amply substantiated and is thus a welcome result. Surely one does want to be able to exclude, in principle, the presence of phonologically null constituents which behave just like PRO or pro, but which may have (antecedent-less) Content such as ROSE or CARPENTER. Even more unfortunate would be the result that silent copies, e.g. of movement or even ellipsis, missing in PF but present in the syntax or in LF, could be associated with independent Content. The matter is, in fact, taken for granted by most syntactic accounts, insofar as the assumption that the moved constituent in e.g. (100) can have a distinct Content from its copy is clearly incoherent.\(^{50}\)

\[(100)\] which chair did you see \((\text{which})\) chair

CHAIR CHAIRPERSON/TABLE

Bearing these desirable results in mind, I now turn to direct evidence that Content is matched on the basis of spelled out configurations, as opposed to the other way around, i.e. to evidence that (98) must be favored over (97).

9.4.2 The spelling out of Content vs. the Contenting of spellout

At first glance, an attempt to choose between the distinct executions in (97) and (98) may appear very much like the proverbial “chicken and egg” question. Upon further scrutiny, however, it turns out that the distinct executions actually make different predictions, and as a result, the matter is an empirical one. Specifically, if it is the assignment of Content to syntactic configurations that determines spellout (and hence, we spell out Content), as in (97), we expect the number of possible en-searches available for any given representation to be informed exclusively by the syntactic structure. For the input in (97), and corresponding to a fixed index for the root, exactly two successful en-searches are possible. One would return Content for some instance of \(\mathcal{C} = \mathcal{V}p\mathcal{P}x\mathcal{V}\sqrt{\text{root}}\), say \(\mathcal{C} = \mathcal{V}\mathcal{T}_\mathcal{R}n\mathcal{X}\mathcal{M}t\), as TRANSMIT. That Content, when composed with \(C_{\mathcal{N}[\mathcal{V}]}\) would in turn give rise to the realizations /\(\mathcal{P}\text{transmission}\)/, /\(\mathcal{P}\text{transittal}\)/ or /\(\mathcal{P}\text{transittance}\)/, all with a predictable interpretation as built on TRANSMIT. The second possible en-search would return atomic Content for the entire structure, \(\mathcal{N} \left[\mathcal{V} = \mathcal{T}_\mathcal{R}n\mathcal{X}\mathcal{M}t\right] C_{\mathcal{N}[\mathcal{V}]}\), and specifically, that of CAR

\(^{50}\) The reader is nonetheless referred to the literature on “stripping” where the matter may not always appear as trivial. A review of the relevant issues is, however, clearly outside the scope of this book.
GEARBOX. This atomic Content, in turn, would then spell out specifically as /_transmission/, but not as /_transmittal/ or as /_transmittance/.51

The predictions of the execution in (98) are identical for the compositional case, but quite distinct for the non-compositional one. Rather, when it comes to matching atomic Content with \([N_{C=V}trans^{\sqrt{mit}}C_{N[V]}]\), the prediction is that at least in principle, three different distinct en-searches could apply to it, contingent, specifically, on the syntactic structure in combination with the phonological realization of \(C_{N[V]}\) and returning three distinct atomic Content units. The different predictions are spelled out in (101a) and (101b) respectively:

\[(101)\]

a. Spelling out Content; (97):
\[\begin{align*}
[N_{C=V}trans^{\sqrt{mit}}C_{N[V]}] & \rightarrow \text{GEARBOX} \rightarrow /_transmission/; \\
*[_transmittance]; *[_transmittal/]
\end{align*}\]
b. Contenting spellout; (96):
\[\begin{align*}
\text{i. } \; [N_{C=V}trans^{\sqrt{mit}}C_{N[V]}] & \rightarrow [N_{C=V}trans^{\sqrt{mit}}/\text{ion}] \rightarrow \text{GEARBOX} \\
& \rightarrow /_transmission/ \\
\text{ii. } \; [N_{C=V}trans^{\sqrt{mit}}C_{N[V]}] & \rightarrow [N_{C=V}trans^{\sqrt{mit}}/\text{ance}] \rightarrow ?? \\
& \rightarrow /_transmittance/ \\
\text{iii. } \; [N_{C=V}trans^{\sqrt{mit}}C_{N[V]}] & \rightarrow [N_{C=V}trans^{\sqrt{mit}}/\text{al}] \rightarrow ?? \\
& \rightarrow /_transmittal/
\end{align*}\]

Neither transmittance nor transmittal correspond to atomic Content, making the issue moot, or so it appears. On the other hand, English may not be the best language in which to illustrate the relevant predictions, because cases in which C-functors have multiple realizations in conjunction with the same root are altogether not common, and in each of these cases, only one (default) realization is available in derived contexts, thereby restricting the inventory of potential cases to those involving the merger of a C-functor with a root. As we shall see in Chapter 11, however, in Hebrew, and in Semitic languages in general, the configuration in (101b) is so common that the favoring of the execution in (98) becomes simply inevitable. This matter aside, relevant cases are available in English with sufficient frequency to illustrate the point, and one such example was in fact already discussed. Thus consider again the pair nation and nature. If we allow for /_true/ as a spellout of \(C_{N[V]}\) (but with the caveat in fn. 28 of Chapter 7 in mind), then the syntactic structure for nature and nation, both with atomic Content, is identical. An execution favoring (97) and consisting of the spelling out of Content would thus need to be represented as in (102a, b):

\[(102)\]

a. \([N_{C=V}nat^{\sqrt{nat}}C_{N[V]}]\) \rightarrow NATURE \rightarrow /_nature/ \\
b. \([N_{C=V}nat^{\sqrt{nat}}C_{N[V]}]\) \rightarrow NATION \rightarrow /_nation/

51 As the execution in (97) will be excluded, I refrain from considering an even more radical version of it, according to which it would be Content matching that would determine the realization of pfx as trans(mit), com(mit), re(mit), and so on.
We note now that given the assignment of two distinct Contents to an identical syntactic configuration, matching NATURE and NATION once they emerge, with /\_\_\_\_\_\_\_\_\_/nature/ and /\_\_\_\_\_\_\_\_/nation/ respectively, requires effectively maintaining, even at the Content matching level, the root index, so as to allow the spellout of Content to circle back into the phonological properties of \[c=\pi\sqrt{\text{nat}}\] to consult the range of possible spellouts for C\_\_\_\_\_\_[V] that may be associated with it (e.g. /\_\_\_\_\_\_/nature/ and /\_\_\_\_\_\_/nation/ but not */\_\_\_\_\_\_/natage/ or */\_\_\_\_\_\_/natance/ or, for that matter, */\_\_\_\_\_\_/natness/), or indeed, the spellout possibilities of the root itself, so as to exclude e.g. the spellout /\_\_\_\_\_\_/people/ for NATION. Even more damagingly, it would require the phonological entry of \[c=\pi\sqrt{\text{nat}}\] to specify, somehow, that the spellout for NATION is with /\_\_\_\_\_\_/ation/ but the spellout for NATURE is with /\_\_\_\_\_\_/ure/. In short, the determination of the actual phonological form for e.g. NATURE on the basis of its Content alone, and given the existence of NATION, is simply impossible. What is of course possible is the existence of a listed pair NATION-/\_\_\_\_\_\_/nation/ alongside another pair NATURE-/\_\_\_\_\_\_/nature/, which happen to be retrievable on the basis of the syntactic representation in (102). Such pairing, however, amounts to the effective resurrection of a lexeme, insofar as it actually makes the existence of the syntactic structure altogether redundant, and the putative derivation of both nation and nature from a common root \[c=\pi\sqrt{\text{nat}}\] neither necessary nor informative. Insofar as the root-based syntactic execution of word formation outlined in this work does show some notable advantages over lexeme-based executions, it emerges that (97) must be dispensed with.

The execution entailed by (98) is, by comparison, considerably more straightforward, allowing the multiple spellouts for C\_\_\_\_\_\_[V] to emerge entirely independently of Content and as contingent on the fact that \[c=\pi\sqrt{\text{nat}}\], just like transmit and defer, may select more than a single phonological instantiation for the C\_\_\_\_\_\_[V] that merges with it:

\[(103)\]
\[\begin{align*}
\text{a. } [s_{c=\pi\sqrt{\text{nat}}}] C_{\_\_\_\_\_\_[V]} & \rightarrow [c=\pi\sqrt{\text{nat}}] /\_\_\_\_\_\_/ure/ \rightarrow \text{NATURE} \\
\text{b. } [s_{c=\pi\sqrt{\text{nat}}}] C_{\_\_\_\_\_\_[V]} & \rightarrow [c=\pi\sqrt{\text{nat}}] /\_\_\_\_\_\_/ation/ \rightarrow \text{NATION}
\end{align*}\]

Nation and nature are not, of course, alone. Similar multiple atomic Contents emerge in the context of other multiple realizations for C-functors. Consider in this respect, the particularly complex Content behavior of commit and its derivatives. On its own, commit has at the very least the Contents in (104a), all possible and attested as interpretations for the compositional derivatives in (104b) (albeit with some idiolectal and jargon-related strong preferences):

\[(104)\]
\[\begin{align*}
\text{a. (to) } [c=\pi\sqrt{\text{mit}}] & \rightarrow \text{CONSIGN (PRISON, HOSPITAL)} \\
& \hspace{1cm} \text{PERFORM} \ (\text{e.g. commit a crime}) \\
& \hspace{1cm} \text{PLEDGE}
\end{align*}\]
\[\begin{align*}
\text{b. } \text{commission; commitment; committal}
\end{align*}\]

As is clear from (104a), more than a single atomic Content may be matched with an identical phonological/syntactic representation. We note, however, that there is little reason to believe that the situation in (104a) is any different from that of \[c=\pi\sqrt{\text{bank}}\] already noted in Chapter 8, section 1.2., where true homophones are disambiguated through context and not through syntactic or phonological properties.
That said, consider now the emergence of derivatives for \([_{C=V}com^π\sqrt{MIT}],\) also at times homophones, and with atomic Content that is distinct from any that could be predictably composed from the Content cases in (104a):

\[(105)\]

\[a.\ [_{N}[^{_{C=V}com^π\sqrt{MIT}}/_{n+ion/}] \rightarrow COMMITTEE\]
\[COMMAND\]
\[FEE\]

\[b.\ [_{N}[^{_{C=V}com^π\sqrt{MIT}}/_{n+all/}] \rightarrow FUNERAL\]

\[c.\ [_{N}[^{_{C=V}com^π\sqrt{MIT}}/_{n+ment/}] \rightarrow DEDICATION (specifically to a romantic relationship)\]

\[(106)\]

\[_{N}[^{_{C=V}com^π\sqrt{MIT}} \cdot_{C=N[V]}] \rightarrow COMMITTEE; COMMAND; FEE; INTERMENT; DEDICATION\]
\[\rightarrow _{π}commission/; _{π}commitment/; _{π}committal/\]

While \(_{π}commission/\) may return more than a single unit of atomic Content, we note, thereby making it comparable to both \(_{π}bank/\) and \(_{π}commit/\), it is also clear that any attempt to search for Content on the basis of \([_{N}[^{_{C=V}com^π\sqrt{MIT}} \cdot_{C=N[V]}],\) as in (106) would compound that homophony with the cumbersome—and wrong—claim that the status of the homophony in (105a) is one and the same as that represented in the structure in (106).

9.4.3 Some ramifications

The conclusion that Content is matched with phonologically realized strings allows us to now offer an immediate answer to some of the structurally puzzling issues that were highlighted at the end of section 9.3.6. Note, in reference to the structure in (87b), repeated with minor modifications below, that if en-searching is only mindful of articulated, or visible, PF representations, then the boxes \(\boxed{2}\) and \(\boxed{1}\) in (107) are in actuality identical, as the copy, \([_{C=V}trans^π\sqrt{FORM}],\) is not a PF object. Nor is it possible to assign separate Content to box \(\boxed{1}\) and to box \(\boxed{3}\) and then compose them, making the composed Content a compound, of sorts, consisting of the Content of a moved constituent along with that of an emerging derivative (i.e. \([TRANSFORMATION+TRANSFORM]; [CAR GEARBOX +TRANSMIT]).\) In fact, it is the invisibility of silent copies that makes it possible, formally, to assign atomic Content to \(TRANSFORMATION\) without retaining, in any sense at all, the Content of \(TRANSFORM:\)

\[52\] Note that box \(\boxed{2}\) has an extra pair of identically labeled brackets:

(i)  
\[\begin{align*}
&\text{a. } [_{N}[^{\cdot_{C=V}trans^π\sqrt{FORM}}/_{π+ation/}] \quad \boxed{1} \\
&\text{b. } [_{N}[_{N}[^{\cdot_{C=V}trans^π\sqrt{FORM}}/_{π+ation/}]] \quad \boxed{2}
\end{align*}\]

Insofar as the extra bracketing is vacuous, however, it is not evident that it is a licit object, let alone a factor that can impact the domain of en-searching.
Turning to more complex derivatives such as those in (88a–b), we note that the presence of silent copies, e.g. box ③ in (108), is not expected to impact Content in any way, nor is it predicted that the silent copies of the root (instances of ①) could contribute their own Content. The potential presence of an altogether silent copy, however complex, as in box ②, is similarly inert, even if the entire structure is taken as the input to en-searching (i.e. ④). From the perspective of en-searching then, ③ or ④ in (108) yield, identically, the phonological string in (109):

In conclusion, and before turning to the details of a phase-based execution to the derivation of complex words in Chapter 10, we note that relegating Content matching to PF is altogether a desirable result, much as it might appear at first sight counterintuitive. It does, however, raise an important question. If, indeed, Content is assigned on the basis of spellout representations, and if, indeed, the semantics of functors, of all kinds, is available in LF, but, presumably, not in PF, how does compositional Content come to be put together? How does the Content of /transmit/, presumably TRANSMIT, come together with whatever contribution is made by C_N[v] or ING_N[v], the latter with a semantic function alongside its categorial one, so as to give rise to a fully compositional Content based on the Content of TRANSMIT, and realized phonologically as /transmission/, /transmittal/, /transmittance/, and /transmitting/? A broad suggestion concerning this matter was already discussed briefly in the introduction to this chapter. I return to a more detailed discussion of the issue in section 6 of Chapter 10.
It is worthwhile concluding this chapter by revising our preliminary description of en-searching, tentatively given in (69). While (110) is not quite our final formulation, it certainly goes some ways towards it. Open issues that will be addressed in Chapter 10 are in parentheses:

(110)  

\begin{itemize}
  \item En-searching, description (not final)
    \begin{itemize}
      \item En-searching operates on (potentially labeled) bracketed phonological strings.
      \item One Content at most per C-core
      \item En-searching is by phase (but how?)
      \item The merger of an ExP-item defines an absolute Content domain (with item yet to be defined: see discussion following the definition in (69)).
    \end{itemize}
\end{itemize}

Appendix: Why Phrasal Idioms are Different

A.1 Introductory comments

The account of Content proposed in this chapter not only does not touch on the matter of phrasal idioms, but is in principle incompatible with offering for them the same account as might otherwise be offered for non-compositional words. Specifically, our account of non-compositionality within the domain of complex words is based on the premise that a specific interface mapping device, en-searching, is responsible for matching bracketed phonological strings with Content, and that the first merging ExP-segment defines the final, absolute Content domain within any given Extended Projection. With the exception of so-called phrasal verbs, i.e. verb particle constructions, where the matter may not be quite so clear cut, it is entirely obvious that in most expressions which are considered phrasal idioms, ExP-segments not only occur, but are at times obligatory, as the small sample in (A1) shows (all idiomatic expressions and idiom chunks in italics; ExP-segment material underlined):

(A1)  \begin{itemize}
  \item a. kick the bucket
  \item b. live it up
  \item c. throw up (one)’s hands
  \item d. \underline{as easy as pie}
\end{itemize}

More specifically, e.g. (one)’s hands is clearly a DP, with a possessor and a genitive marker. Insofar as both hands and throw up combine to give rise to the idiomatic Content here, they clearly cannot define a single en-search domain. Similar logic would preclude a single en-search for e.g. (A1d) because of the presence of two occurrences of as, both clearly realizations of some ExP-segments.

The exclusion of phrasal idioms from the domain of single en-searching, and hence, by this claim, from the domain of atomic Content, in turn flies in the face of common wisdom within generative grammar, where phrasal idioms are more often than not treated as syntactically constructed, to be sure, but nonetheless listed and assigned atomic Content as such. In fact, and with an even greater similarity to the system outlined here, it is typically assumed that phrasal idioms require the adjacency of fixed phonological instantiations, and that absent such adjacency or such fixed phonological strings, an idiomatic reading is lost. Thus spill the beans may mean ‘reveal a secret’ but not so either (A2a) or (A2b):
In view of this, one potential criticism that may be leveled against the account of Content proposed in the present study is precisely the fact that as a matter of principle, it does not allow for a uniform Content matching mechanism for complex words and phrasal idioms. It is thus incumbent upon us to provide a motivation for this separation. The reader should be aware however that it is not my intention to propose how, exactly, Content is assigned to phrasal idioms, although some of the observations below certainly bear on this matter. Rather, the brief discussion of phrasal idioms in this appendix is intended to set them sufficiently apart from complex words to justify the existence of an independent Content-matching mechanism for them, however otherwise structured and devised.

As our starting point, we note that to a large extent, the view of phrasal idioms as listed, arbitrary units stems not from any inherent consideration of phrasal idioms as such, but from another consideration altogether, namely the fact that phrasal idioms have been consistently used in the history of generative grammar to argue for movement. To exemplify, the contrast between (A3a) and (A3b) is typically taken to argue for movement in the former vs. control in the latter, an argument that is very much based on the assumption that the phonological integrity of idioms must be maintained at some level:

\[(A3)\]  
\( a. \text{the cat seems to be out of the bag} \)  
\( b. *\text{the cat decided to be out of the bag} \) (* with italicized expression to indicate absence of idiomatic reading)

Similarly, the grammaticality of (A4) serves to argue for a head raising analysis in relative clauses (cf. Vergnaud 1974, 1985; Kayne 1994):

\[(A4)\]  
\( a. \text{the strings that Mary pulled to get that job} \)  
\( b. \text{the advantage that Jeff took of Peter} \)

In turn, neither Raising-to-Subject nor the head raising analysis of relative clauses is dependent on the idiom argument, and in fact, to the extent that any argument for movement is corroborated solely thus it is a very weak argument indeed. On the contrary, and regardless of the frequency of idiom chunk-based arguments, evidence for movement in syntax by now rests on considerably more solid grounds, and is thus altogether in a position to dispense with idiom-chunk based arguments, which as it turns out, do not necessarily survive a closer scrutiny.\(^{53}\)

\(^{53}\) Nunberg, Sag, and Wasow (1994), whose excellent arguments for the (partial) compositionality of idioms are at the core of this brief note, rather opt to argue against “idiom chunk-based arguments for movement” by arguing against movement altogether. We note that if there is no movement in e.g. (A3a) or (A4), then it certainly follows that phrasal idioms cannot require phonological integrity. The converse, however, does not follow. In other words, it is perfectly possible for the movement under consideration to take place, even if phrasal idioms can be (partially) compositional and do not require phonological integrity. As noted in fn. 56, the commitment to using the analysis of idioms as a platform from which to challenge syntactic movement actually leads the above authors to a position of internal inconsistency.
Before proceeding, it is worthwhile noting, as is indeed well known, that any structural
generalizations concerning phrasal idioms are extremely difficult to come by. To illustrate,
while many an argument for movement is based on the movement of idiom chunks, what is the
textbook case of English idioms, *kick the bucket*, resists all such movement, thus marking it as
very distinct from e.g. *strings* and *advantage* in (A4), which must be presumed to have both
passivized and raised to the head of the relative clause. Nor do idioms cluster into any
particular syntactic structure; and for that matter; it is not altogether agreed upon what
expressions are idioms and what expressions are not. A brief list of contenders, based on
Nunberg, Sag, and Wasow (1994) and Kovecses and Szabó (1996) is in (A5):54

(A5)  
a. lend a hand  
b. cats and dogs  
c. at sixes and sevens  
d. throw up (one)’s hands  
e. not worth the paper it’s printed on  
f. as easy as pie  
g. (go on,) fire away!

Considerably more serious, from our perspective, however, is the presence of a myriad of
characteristics which suggest that viewing phrasal idioms as arbitrary and non-compositional
is on the wrong track. Rather, and as emerges primarily from the thorough investigation by
Nunberg et al. (1994) as well as that of Kovecses and Szabó (1996), phrasal idioms straddle a
middle ground. Although some arbitrary choices are made, specifically concerning some (but
as we shall see not all) phonological realization for some items of Content (e.g. *spit fire* but not
*spew fire*), for most phrasal idioms, at least some measure of compositionality must be assumed
to survive.

Unless otherwise noted, arguments for compositionality below are reproduced from
Nunberg et al. (1994). Semantic and Content-based arguments for the compositionality of
idioms are summarized in (A6) and are briefly discussed in section A2. Syntactic arguments for
the compositionality of idioms are listed in (A14) and are briefly discussed in section A3.
Section A4 contains a few brief comments on the (putative) absence of phrasal idiomatic
reading in derived nominals.

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54 Throughout the ensuing discussion, I have attempted to minimize reference to idioms which involve
light verbs such as *take*, *get*, or *make*. The case for light verb constructions such as *take a piss/shower*, *make
daywaves*, *make headway*, *take care*, or *take advantage* as listed idioms is particularly weak, and as a
consequence any argument against the listedness of idioms based on such cases is similarly questionable.
Aphorisms are likewise avoided where possible, as even among people who subscribe to the view that
idioms are listed, there is no consensus as to whether they are part of the same phenomenon.
So-called phrasal verbs, i.e., verb–particle constructions, present an altogether different challenge.
Although the matter cannot be pursued here in any detail, I do believe that these are assigned atomic
Content, and that furthermore, no ExP-segments separate the root—for it is always a root—and the
particle. Effectively, particles are discontinuous prefixes, and should be treated as such. The theoretical
challenge here concerns, of course, the successful modeling of such a discontinuous phonological
representation.
A.2 Semantic and Content arguments for (partial) idiom compositionality

(A6) The arguments, an overview:

a. Chunks of idioms allow internal modification that clearly does not modify the idiom in its entirety.
b. Chunks of idioms can be contrastively focused.
c. Idiom chunks allow pronominal reference.
d. Idioms cluster together around identical items.
e. Content-equivalent terms can frequently replace canonical idiomatic expressions.
f. Key idiom chunks can carry idiomatic Content outside their prescribed syntactic listing.
g. Rather than being arbitrary, many terms used in idioms are cognitive metaphors, i.e. conventional extensions of concepts.

By way of illustrating (A6a), consider the cases in (A7), from Nunberg et al. (1994):

(A7) a. leave no legal stone unturned
   b. your remark touched a couple of nerves
   c. tilting at the Federal windmill
   d. we could yet pull more strings

Importantly, as Nunberg et al. note, the underlined modifiers are internal to the idiom—touch a couple of nerves is not the same as touch a nerve twice; leave no legal stone unturned does not mean leave no stone unturned within the bounds of what is legal. Rather it means (roughly) that all legal methods have been used. Such modification internal to the idiom would be neither expected nor formally possible if idioms were wholly listed.

(A8) is an illustration of (A6b). Yet again, note, the contrastive focus does not range over the entire idiomatic expression. (A8b) does not entail that there won’t be any tilting at windmills altogether. Rather, there won’t be any at those windmills:

55 Lest the reader is tempted to compare the cases in (A7) to morphological bracketing paradoxes, we note that while such paradoxes are not discussed in detail in this work, there is little reason, from the perspective of XSM, to exclude the structure in (i), thereby doing away with that particular paradox (and see Chapter 12 for some comments in the context of Synthetic Compounds):

(i) [[[nuclear physicist]]]

Turning now to bracketing paradoxes such as unrulier, the problem here is that -er may only attach to monosyllabic forms, but in unrulier, the comparative clearly scopes over unruly, all the more so as ruly or rulier are not actually attested words.

We note now that un must spell out at the C-core edge. /ɛr/, in turn, is the realization of an ExP-segment within the adjectival Extended Projection, and hence must follow the realization of un. Suppose now that /ɛr/ is neither an S-functor nor a morpheme, but rather an instance of amorphemic S-marking, as in (ii). That the bound comparatives marker /ɛr/ is an instance of S-marking is particularly plausible in view of the existence of suppletive bound comparatives, a matter already noted in Chapter 7, section 6:

(ii) DEG COMPDEG ≪[A \text{unruly}]COMP≫DEG [A \text{unruly}]

But if the structure is indeed as in (ii), then scope is actually computed not relative to /ɛr/, realized in (ii) precisely where it phonologically can be realized, i.e. on /ɛrul/, but rather relative to the abstract S-functor COMP. If at all on the right track, then, this approach summarily does away with the relevant paradox, while providing additional support for the non-morphemic structure of S-marking.
(A8)  
  a. Those *strings* he wouldn’t *pull* for you.  
  b. Those *windmills*, not even he would *tilt* at.  
  c. That *hard a bargain*, only a fool would *drive*.

That pronominal reference to idiom chunks is possible, contrary to frequent claims to the contrary, is likewise noted by Nunberg et al., and a few illustrations are in (A9):

(A9)  
  a. We worried that Pat might *spill the beans*, but it was actually Chris who *spilled* them.  
  b. Once somebody *lets a cat out of the bag*, it’s out of the *bag* for good.  
  c. *Close tabs* might have been *kept* on Jane Fonda but none were *kept* on Vanessa Redgrave.  
  d. Pat tried to *break the ice* but in the end it was Chris who actually *broke* it.

Finally, Nunberg et al. point out that if idioms were entirely arbitrarily Contented, we wouldn’t expect the clustering of similar Content around similar items. Such clustering, however, is very common, and a few examples are in (A10):

(A10)  
  a. *hit the hay/the sack*  
  b. *pack a punch/a wallop*  
  c. *throw someone to the dogs/lions/wolves*  
  d. *give hostages to fortune/time/history*

An even stronger point can be made here than that made by Nunberg et al. Note that quite frequently, items within idiomatic expressions can be replaced with non-idiomatic items with similar Content, without loss of the idiomatic reading. The point, we note, differs from that illustrated by (A10) insofar as the replacement expressions are not conventionalized in any way. Such replacement, interestingly enough, is prescribed, insofar as e.g. neither *bridge* nor *cross* can be substituted without loss of idiomatic reading in (A11a), nor can *baby* or *bathwater* be substituted in (A11b). Everything else, however, is rather free, or so it appears:

(A11)  
  a. We will *cross* that *bridge* {when/if and when/at such time as} we {come/get} to it.  
  b. {*throw out/*toss out/*dump/*junk/*discard*} the *baby* with the *bathwater*  
  c. {*ramming/*shoving*} something *down* somebody’s *throat*

Rather consistent with the range of possible substitution in (A11), we note that an idiomatic reading is regularly invoked without any reference to the syntactic structure with which, by assumption, it is listed. While presumably such structure may underlie, historically or synchronically, the emergence of such use, that it is possible at all suggests that idioms cannot possibly be listed as syntactic frames, and that it is quite possible for some well-defined parts of idioms to carry the idiomatic reading on their own, away from their prescribed syntactic environment:

(A12)  
  a. The *Bucket List*  
  b. separating the *baby* from the *bathwater*; The *Baby* and The *Bathwater*; *throwing out the baby*, not the *bathwater* (G)  
  c. *baby bathwater* toss (G)

A somewhat different argument for the compositionality of idioms is mounted in Kovecses and Szabó (1996). Specifically, and taking a leaf from Lakoff (1987), they show quite convincingly that many an idiomatic expression is based on a conventionalized metaphorical
extension of particular concepts ("cognitive metaphor", in Lakoff’s terms). If we assume, which appears plausible, that e.g. fire has conventionalized metaphorical extensions that cover intense feelings of all sorts, the idiomatic expressions in (A13) become considerably less arbitrary than one would have assumed otherwise (although we do note that the use of wet blanket rather than towel or sheet still needs to be specified). We also note, in this context, the fact that not only fire but quite a few of its collocates may be used to the same effect, further supporting the compositional nature of the Content formation here:

(A13)  

a. Anger:  
   i. He is spitting fire  
   ii. Smoke is coming out of his ears  

b. Love  
   i. I am burning with love  
   ii. She carries a torch for him  

c. Excitement  
   i. fan the flames  
   ii. Don’t be a wet blanket

A.3 Syntactic arguments for the (partial) compositionality of phrasal idioms

(A14) The arguments: an overview

a. Idiom chunks may be elided (in VP ellipsis).

b. Idiom chunks may serve as objects of non-idiomatic verbs with idiomatic meaning preserved.

c. Idiom chunks may be coordinated with non-idiomatic constituents without loss of idiomatic Content.

d. Idioms may constitute the output of movement rules (passive, Tough, comparatives).

An illustration of (A14a) is in (A15):

(A15)  

a. My goose is cooked but yours isn’t.
   
   b. We thought the bottom would fall out of the housing market, but it didn’t.

   (A16), quoted by Nunberg et al. from the Washington Post Weekly (September 13–18, 1993), illustrates both (A14b) and (A14c). Note, first, that the idiomatic verb chunk tilting may be coordinated with the non-idiomatic verb reinventing without loss of idiomatic Content. Even more striking is the fact that we have here an idiom object chunk, with an idiomatic Content, serving as an object of a non-idiomatic verb, as a result of the coordination:

(A16) Reinventing and tilting at the Federal windmill

   A particular challenge for listing complete idioms emerges from the existence of idioms that take, as their input, the output of movement rules, noted originally in Brame (1978). Passive idioms are in (A17). Cases of A’-dependencies internal to idioms are in (A18) (although, as noted by Nunberg et al., these are rare).

56 Ironically enough, the facts here constitute considerably stronger evidence for the compositionality of idioms in a model which assumes syntactic movement than in a model such as that espoused by
(A17) the die is cast; the race is run; if the truth be known; my goose is cooked; fit to be tied; caught short; written on water; when all is said and done; cast in stone; may as well be hung for a sheep as for a lamb

(A18) a. hard to take; play hard to get; too hot to handle; difficult to come by
b. more dead than alive; colder than a witch’s teat

As noted directly in Brame (1978), it is hard to see how the view of idioms as listed syntactic strings with arbitrary Content can be reconciled with idioms in (A17)–(A18) in a model that assumes that passive, Tough, and comparatives are derived by movement. Given late Content matching, we note, the problem for (A17) may not be the fact that it is a post-movement realization, but rather the fact that the listing would need to make reference to silent copies of movement. The same problem exists for (A18a) (e.g. in John is hard to take John) where it is further compounded by the fact that if Tough involves direct movement, such movement would need to be into, and then again out of, a listed item. If, on the other hand, one subscribes to the view that Tough constructions involve an abstract operator bound by the subject, our listed idiom would need to come with a built-in abstract operator and would obligate binding into it.

We note, finally, that even in a model without movement, such as that espoused by Brame (1978), it is rather hard to see how (A18b) can be reconciled with listing. Under any analysis, comparatives involve an abstract operator of some kind. How to build the existence of such an operator into a non-compositional Content for a listed item, in turn, is by no means a trivial matter in any theory that assumes compositional semantics, quite apart from whether it subscribes to the existence of movement or not.

A.4 Phrasal idioms and derived nominals

Before concluding this appendix, a brief note is in order about the existence, or lack thereof, of idiomatic expressions which are derived nominals. Specifically, we note, the idiomatic reading associated with the relevant verbal instantiation is not preserved in the cases in (A19) (and see in this context Ackema and Neeleman 2004):

(A19) a. *the spilling of the beans
b. *the kicking of the bucket
c. *the pulling of (one)’s leg
d. *the carrying of a torch

Nunberg et al., in which no movement operations are allowed. Specifically, if one were to allow for the listing of idioms, the facts in (A17)–(A18) could be used, and rather convincingly so, to argue against movement, which is indeed the precise use made of them in Brame (1978). In turn, this is a move that Nunberg et al. are clearly prevented from endorsing, precisely because they argue against the listing of idioms. Rather, Nunberg et al. use the cases in (A17)–(A18) to challenge Chomsky’s (1980) claim that such cases do not exist, one of his arguments in favor of the use of idiom chunk arguments for movement. We note that by showing Chomsky to be empirically incorrect on this point, they do indeed invalidate the idiom-based arguments for movement. Chomsky, however, can only be incorrect about idioms if the structures in (A17)–(A18) involve some mapping, however formulated, between two representations, and as such are distinct from, for example, active sentences or cases such as it is hard to take exams. Ipso facto, then, their argument against Chomsky presupposes movement, which otherwise is exactly what they seek to challenge.
Although to the best of my knowledge the matter has not been directly discussed in the literature, informally it is at times suggested that the absence of a carry-over from the VP idiomatic source can be construed as evidence against embedding VPs within nominals. The force of such a putative argument, however, is far from clear. Note, first, that in actuality, derived nominals with an inherited idiomatic interpretation do occur, as illustrated in (A20):

(A20)  a. futile tilting at windmills  
       b. the fanning of the flames  
       c. the serving of time  
       d. no pulling of strings!  
       e. [W]hat we do, including the paying of attention to something, is explained . . . (G)  
       f. I so understand the stepping on toes & [the] jumping through hoops to find . . . (G)  
       g. the ramming down of a Nuclear Power Plant down unwilling people’s throats . . .  
             (G, sic.)  
       h. that very incident marked the biting of the dust for the U.S.A . . . (G)

What does appear to be true is that idioms specifically involving direct objects, and which would require, within a derived nominal, the introduction of of, are at least at times disfavored, an altogether rather different matter and, if the case, relatively simple to account for. We do note, nonetheless, that of idiomatic AS-nominals do occur. Of particular interest in this context is (A20c), where the AS-nominal shares the idiomatic meaning of the corresponding VP, and not that of the Synthetic Compound time serving or time server ‘opportunism/opportunist’:

(A21) The time of incarceration, ‘the wasting game’ of ‘physical containment’ means that you feel the serving of time as it seems to take ages and ages . . . (G)

In turn, if anything, the full acceptability of (A20a-h) directly supports a verbal source for these derived nominals, all the more so as to the best of my knowledge derived nominals never occur with an idiomatic reading that is not verbal in origin.

The shoe, in fact, is on the other foot here, to invoke appropriately a phrasal idiom, insofar as the absence of an idiomatic reading for the cases in (A19) is in fact considerably harder to explain within lexicalist approaches to derived nominals. To wit, in lexicalist approaches that do postulate a verbal source for derived nominals, e.g. with inheritance of some sort, it is entirely unclear why nominalization of idioms, together with the preservation of idiomatic reading, should be blocked, if indeed idioms are fully listed. For accounts such as Chomsky (1970), the puzzle is even more acute, as by assumption any idiomatic listing should affect not a verb as such, but a category-neutral root that is realized as either nominal or verbal in distinct contexts. It is hard to see how (A19) can be directly accounted for under such terms. Finally, for accounts such as Grimshaw (1990) which do not postulate any inheritance, the question becomes why idioms should be so tenaciously missing from derived nominals, but present, across the board, in so many other configurations, nominal as well as verbal. All the more so as Synthetic Compounds do allow, at times, the preservation of idiomatic Content that is otherwise impossible in (A19), as (A22) illustrates:

(A22)  a. leg pulling  
       b. bean spilling
I return to the issue of Content matching in Synthetic Compounds in Chapter 12, where Content contrasts with AS-nominals are specifically discussed. It is worthwhile noting, before concluding this short note on phrasal idioms, that whatever restriction excludes the derived nominals in (A19) cannot possibly have a universal force, as in Hebrew, the nominalization of VP idioms is amply attested, as illustrated by the small sample in (A23): 57

(A23) a. hilbin pney xaber b-a.rabim
    whiten face friend in-the.many
    ‘shame someone in public’

b. daxaq raglayim
    crowd legs
    ‘supplant, usurp someone’s place’

c. ibed ‘et ha.šeštonot
    lose om (the.senses)
    ‘lost it’ (idiomatic)

d. he?emid pan.im
    position face
    ‘pretend’

e. hexzir ʔaṭara, le-yošn.a,
    returned coronet to-oldness.it
    (lit. return a coronet to its older state)
    ‘return x to glory; restituting’

f. dibber ʔal leb (someone)
    talked on heart someone
    ‘beseeching someone; entreating’

a’. halbanat pney xaber b-a.rabim
    whitening face friend.his in-the.many
    ‘shaming someone in public’

b’. dxiqat raglay.im
    crowding legs
    ‘supplanting, usurping someone’s place’

c’. obdan/ibbud ʔeštonot
    loss senses
    ‘losing it’ (idiomatic)

d’. haʔamadat pan.im
    positioning face
    ‘pretending; pretension’

e’. haxzarat ʔaṭara le-yošn.a
    returning coronet to-oldness.it
    ‘returning x to glory; restituting’

f’. ha.dibur ʔal leb (someone)
    the.talking on heart someone
    ‘beseeching someone; entreating’

57 Innovative VP idioms in use in Modern Hebrew, of which there are many, cannot actually be embedded within derived nominals because of register clash. Most such idioms are extremely colloquial, and AS-nominals, while fully licit, are nonetheless of a considerably higher register. Idioms used to illustrate our point in (A23) are therefore quite stylistically high themselves, and tend to be older. All are still in current use, and judgments concerning the acceptability of the nominal variants are extremely clear. The “direct object” instances in (A23a–c) are given in the Construct which is stylistically favored, but are possible with ʔel as well. Not so (A23d) where ʔel is excluded. At least at times, a bound pronoun is obligatory if the object is definite (e.g. whitened the face of his friend). As the matter is orthogonal here, all otherwise non-obligatory bound pronouns are omitted.
10

Taking Form by Phase

10.1 Spellout by Phase and Root Locality

10.1.1 Phases and spellout—the issues

I have concluded that an adequate account for the emergence of Content requires a derivational, rather than a representational account, suggesting, rather strongly, that the execution should be phase-based. I have further suggested that Content is matched on the basis of bracketed phonological strings, and thus silent copies as well as phonologically null elements are simply invisible to en-searching and can neither have Content nor impact its matching in any way. The aim of this chapter is to make our phase-based execution as explicit as possible. As we shall see, the picture that will emerge is a complex one, and at least in some respects rather surprising. As we shall also show, it is nonetheless inevitable. As will be discussed in detail in Chapter 11, its inevitability receives strong and conclusive support from what, in a Semitic language, is simply the only possible way to go.

According to Chomsky’s (2001) Phase Theory, at various points in the derivation a representation can be shipped over to PF (as well as to LF) to be spelled out. Once it is spelled out, the only properties it has which remain available to continuing computation are those associated with its head or with its left edge. A variety of locality conditions proposed in the history of syntax would now follow not from the existence of constraints that restrict long distance dependencies or which define locality on representations, but rather from the fact that long distance dependencies simply couldn’t exist if the structure that would have given rise to them had been spelled out and thus had effectively vanished.1

1 It is worthwhile noting the similarities and the differences between Phase Theory and the Lexical Integrity Hypothesis (Lapointe 1980) (alternatively the Atomicity Thesis of Di Sciullo and Williams 1987). Insofar as Phase Theory subscribes to the view that there is a well-defined representation which is a conjunction of phonological, syntactic, and semantic properties, and insofar as it subscribes to the view that the internal properties of such a representation are opaque to the domain within which it is embedded, a Chomskyan phase is very much like an “atomic word” in the sense of Di Sciullo and Williams. The notions do, however, part ways in important respects. First, the processes leading to the emergence of such an opaque, “atomic” domain in lexicalist executions are formally distinct from the syntax, while phase-internal structure is every bit as syntactic as the structure in which it is embedded. Second, and quite possibly more crucially, in Phase Theory, but not in lexicalist approaches, the assumption is that “atomicity” is not a primitive, but rather a direct result of the shipping of the relevant representations to be spelled out and interpreted.
Empirically, the true challenge of Phase Theory is the accurate translation of locality conditions to specific points in the derivation such that the convergence of spellout, erasure of syntactic internal structure, and formal semantic properties can be captured. Borrowing a chapter from a long history of syntactic research, it goes without saying that CP and DP (in their various incarnations) constitute phases in the intended sense. From the perspective of our subject matter, however, the question is whether any important insight can be gained concerning the properties of “complex words” if we constrain their construction by phases.

Suppose we return, then, to the two puzzles concerning the difference between AS-nominals and R-nominals posed at the beginning of Chapter 9, and resolved in section 3.4 of that chapter. As already noted (cf. section 3.6 of Chapter 9), the resolution of these puzzles makes a phase-based approach not only extremely attractive, but also inevitable. More specifically, we noted that at the very least, the (maximal) C-core, or possibly the domain of first ExP-item merger, must constitute both a spellout and a Content domain. It is within that domain that Content must be matched with the V- or V-equivalent portion of AS-nominals, for otherwise it is doomed to permanent Contentless-ness. The relevant structures are thus as in (1)–(2) (and see also Chapter 9, examples (77)–(79) and (84) and related discussion):²

![Diagram of AS-nominal and R-nominal structures]

The failure of other phase-based approaches to predict correctly the domain of Content, or to account for the contrasts between the properties of AS-nominals and R-nominals was already reviewed in section 2 of Chapter 9. From the

² Note the specific execution for Content matching in the compositional R-nominal in (2a). Other hypothetical options were briefly outlined in section 3.6 of Chapter 9 but will be excluded in due course.
specific perspective of Phase Theory, however, what is noteworthy is that Phase-at-Categorization, as in Arad (2003, 2005), altogether fails to correlate Content with phonological domains, as noted in Lowenstamm (2010). Lowenstamm’s own attempt, on the other hand fails precisely insofar as it takes for granted the veracity of the conclusions reached by Level Ordering accounts. Insofar as the latter are, in actuality, empirically flawed, Lowenstamm’s account inherits their problems. The choice of affix (or affix boundary) certainly does predict correctly phonological stress effects. In turn, and as we shall see, there is every reason to assume that the merger of affixes does define a phase. What is not possible, however, is to postulate a general domain such that it separates stress-shifting affixes (those with + boundary) from those that are not (those with # boundary). Such an attempt fails on two grounds. First, atomic, non-compositional Content can and routinely does emerge in the context of # boundaries, of which compounds are the most productive occurrence (cf. network, airhead), but there certainly are enough non-compositional derivatives with an internal # boundary to make the identification of # boundary with an (absolute) Content phase unworkable (e.g. -ism derivatives such as communism, existentialism; -ing derivatives such as belongings and reading; -er derivatives such as pretender and dictator; etc.). Nor is a phase at # particularly useful in shedding light on the divergent Content behavior of AS-nominals and R-nominals, given the fact that the AS-nominal transform+ation and atomic Content transform+ation come with an identical boundary configuration. More fundamental, however, is the fact that the distribution of + and # boundaries cannot be ordered in blocks, as has emerged from multiple criticisms of the Level Ordering Hypothesis in the past two decades. Rather, some non-stress-shifting affixes, by assumption # affixes, can occur within stress-shifting affixes (by assumption + affixes) with stress-shift affecting material internal to the # affixes as a consequence, a matter already reviewed in section 2 of Chapter 9 (e.g. gouvernement vs. governméntal). Insofar as the most fundamental aim of the Level Ordering Hypothesis was to reduce factors such as the free vs. bound occurrence of roots and atomic Content to the domain of stress-shift and assimilation, it is clear that there is no such coherent incrementally constructed domain and that as a result, equating the # boundary with a phase is not feasible.

A coherent treatment of boundary types is, of course, possible, providing Level Ordering, as such, is abandoned (see, especially, Plag 1999). Suppose now we view the + boundary as a mnemonic for inducing stress shift (plus potentially additional phonological processes), but that no such properties are associated with # boundaries. Suppose now that every affixation constitutes a (phonological) phase, or differently put, that any boundary, whether + or #, constitutes a phase, and that as a result every affix, where by affix we refer to the spellout of some C-functor, can only “see” its adjacent domain as a whole, with its internal structure opaque. Considering e.g. governmental, we note that the following set of properties emerges, with boxed constituents, at each level, internally opaque in the relevant sense:
We note now that the full phonological realization of e.g. /n go\ra\v\n\nt\a/ in (3c) cannot be accomplished before the spellout of +al. Specifically, it is only in the context of +al that stress can be assigned to yield /n\a\v\n\nt\a\v\nt\a/ Some spellout domain, then, must be defined not relative to the constituent [government] in isolation, but rather in the context of +al. The possible domains for such spellout are in turn in (4a–c):

By way of elaborating, if (4a) is favored, a realization domain is defined by the merger of a + boundary, or possibly the merger of +al, and a full realization as /n\a\v\n\nt\a\v\nt\a/ follows in its wake. Note that in the configuration in (4a), +al and [government] are unordered, and that under the plausible assumption that stress is affected not only by boundary type, but also by the suffixal nature of the affix, it is in all probability not the way to go. It does not, however, rule out the possibility that some properties, phonological or others, may be defined relative to the boxed constituent in (4a). As an aside note that if (4a) is excluded as a potential input to spellout, we may dispense, as well, with the phonological realization of C_{A[V]} at that level, postponing it, rather, to the adjoined structures in (4b–c).

Neither (4b) nor (4c) face an ordering problem, both being post-adjunction structures. The distinction between them, in turn, revolves around the question of whether what ends up as /n\a\v\n\nt\a\v\nt\a/ is constructed from /n\a\v\n\nt\a\v\nt\a/, stressed

---

3 Under the assumption that (4a) represents an unordered set, and that unordered sets cannot be phonologically realized, we can safely exclude a fourth logical possibility, namely one involving the spellout of the higher instantiation of C_{A[N]} in (4a). The structure is, however, unambiguously headed by C_{A[N]}. See Chapter 6, section 4 for discussion.
in the context of \(+\)(al), and then combined with \(\pi_{+}\)(al), as in (4b), or alternatively from a unified spellout of the entire \(C_{\text{A}[N]}\) constituent as \(\pi_{+}\)governmental as in (4c). We note further that under execution (4b), \(C_{\text{A}[N]}\) must be realized as \(\pi_{+}\)(al) with the relevant boundary type prior to the realization of \(\pi_{+}\)governmental. This, however, is not the case for the execution in (4c), where the input to spellout may allow for a simultaneous realization of \(\pi_{+}\)governmental without assuming a previous stage at which \(\pi_{+}\)(al) has already been realized.

We note finally that, the representations in (4a–c) notwithstanding, we must address another important question: \([\text{government}]\), as it turns out, is already a derived form consisting of \(\pi_{+}\)vernment; whatever considerations we bring to bear on the spellout of governmental should apply to government in an equal fashion. Specifically, we must ask at what point \(\pi_{+}\)vern spells out, and whether any of its properties as a root are still available within governmental. Should the latter turn out not to be the case, we must allow for the possibility that phonological realization is incremental, proceeding, broadly, along the following lines:\(^4\)

\[
\begin{align*}
\pi_{+}\text{GOVERN} & \rightarrow \langle N \pi_{+}\text{GOVERN} C_{\text{N}[V]} \rangle \\
& \rightarrow \{ \rightarrow \langle N \pi_{+}\text{VERN} \rangle \# \langle N \pi_{+}\text{vernment} \rangle \}
\end{align*}
\]

But if the correct derivation is as in either version of (5), then we must allow for the possibility that the input to (4) is already at least partially realized, and while some version of (4) is allowed to augment that phonological representation, specifically by the shifting of stress, it remains the case that e.g. \(\pi_{+}\)vern itself, or the realization \(\pi_{+}\)ment/ cannot be altered. The consequence is an incremental phonological realization such that it would allow its final output \(\pi_{+}\)vernment/ in some contexts, but \(\pi_{+}\)vernment/ in others.

Suppose, then, we pause for a brief summary. We concluded that a maximal projection cannot always constitute a domain for phonological realization, and rather phonological realization is routinely impacted by elements that merge with such maximal projections. If spellout is by phase, it emerges that a phase cannot be simply defined as a maximal projection, as the shipping of representations to be realized at a maximal projection boundary is sure to give us the wrong result in all cases where the type of boundary involved determines the realization, and when such a boundary is only available as a result of spellout of a functor in a higher domain. At the very least, then, a maximal projection must be allowed to be realized within the domain that immediately contains it.

When we turned to narrowing down what, exactly, the relevant domain might be, so as to give rise to the correct empirical results, it emerged that several structural options are available, and that while some of them appeared, at least for some cases, disfavored (e.g. (4a)) the choice between others was not self-evident. Nor was it clear what conditions, if any, may constrain such domains in contexts of multiple additional mergers.

Finally, and depending on the specific domains proposed for spellout, it may inevitably emerge that phonological realization is incremental, insofar as full

\[^4\text{For execution purposes, I am assuming that stress is assigned tovern but is recalculated (but presumably not altogether deleted) at subsequent realization stages. Other executions are possible.}\]
phonological information is not available at any one stage, but may be augmented throughout the derivation.

10.1.2 *Phases and locality conditions on roots*

In an attempt to resolve these issues, suppose we return to the locality conditions previously motivated in this book, with the aim of examining how well our distinct phase-candidates fare relative to them. Specifically, I motivated the following two important locality conditions:

(6) a. Roots (=phonological indices) (may) affect phonological spellout in their local domain (cf. Chapter 6, section 2.5)\(^5\)
   b. En-searching takes as its input bracketed phonological strings. ExP-item defines an absolute en-searching domain (section 4 of Chapter 9 for discussion)

(7) *En-searching, description (not final)*
   i. En-searching operates on (potentially labeled) bracketed phonological strings
   ii. One Content at most per C-core
   iii. En-searching is by phase
   iv. En-searching is stopped by an ExP-item (with item yet to be defined)

In section 10.2 I turn to the investigation of the interaction between Content and phases, as they are defined through affix boundaries. In the remainder of this section my chief concern is the interaction of such phases, or domains, with phonological root selection. Specifically, I suggested that roots impact the phonological spellout of C-functors that merge with them. Thus it is the root \(\pi \text{fer}\) that determines the spellout of the \(C_{N[v]}\) merging with it as either \(\pi +\text{al}\) or \(\pi \#\text{ment}\) to give rise to \(\pi \text{deferral}\) or \(\pi \text{deferment}\) respectively, and it is \(\pi \text{govern}\) that determines the spellout of the \(C_{N[v]}\) merging with it as \(\pi \#\text{ment}\). We note as an aside that both (nominal) \(\pi +\text{al}\) and \(\pi \#\text{ment}\) are specifically root-selected and not default realization here, and yet, one comes with a + boundary, and the other with a # boundary. It thus emerges that root selection cannot be correlated with boundary type. For instance, it cannot be the case that root-selected realizations come with +, as \(\text{deferment}\) and \(\text{government}\) show. Nor is it the case that default realizations come with \(\pi\), as both \(\pi \text{ation}\) and (adjectival) \(\pi \text{all}\) are instances of + affixes, although default. The inevitable conclusion, then, is that boundary types are not properties of domains, as per the Level Ordering Hypothesis, or as in Lowenstamm (2010), but rather must be considered exclusively as phonological properties of affixes, rather in line with Plag (1999).\(^6\)

\(^5\) A. For X, X is a terminal, the phonological selection for X must be realized within the domain of X. B. Y is in the domain of X iff there is a \(\pi\) such that \(\pi\) immediately dominates X and Y is contained in \(\pi\), and there is no W a such that W is a terminal and W is contained in \(\pi\) and Y is contained in the domain of W. (Ch. 6, (49)).

\(^6\) Contrary to Plag (1999), however, I do endorse the distinction between default and root-selected realization, as already outlined in detail in Chapter 6. That distinction, however, cannot be cast in terms of boundary type. Note that “default” in the relevant sense may still be domain-specific (e.g. in merging with \(\pm\) Latinate forms), making both Contrary /\(\pi \text{ity}\) / and /\(\pi \text{ness}\) “default” in the relevant sense.
Importantly, and insofar as roots may determine the spellout of merging C-functors, it is clear that the selection properties of a root must continue to be active once it merges with a C-functor, for it is precisely once such merger occurs that selection may be exercised. Equally clearly, no such root selection is available for (9), resulting in the default instantiation of the affixes as in (10):

\[
\begin{align*}
(8) \quad C_N[V] & \to /\text{ment}/ \quad [C=\text{de}^\text{r}_\text{FER}], [C=\text{v}^\text{GOVERN}], [C=\text{v}^\text{ABATE}] \quad \text{______} \\
C_N[V] & \to /\text{al}/ \quad [C=\text{de}^\text{r}_\text{FER}], [C=\text{e}^\text{r}_\text{FER}], [C=\text{re}^\text{r}_\text{cite}] \quad \text{______} \\
\dots \\
C_N[V] & \to /\text{ation}/ \quad \text{elsewhere}
\end{align*}
\]

(9) a. *government-ic; *organization-ous
   b. *formal-ify; *formal-ate
   c. *metrifi-ance; *metriciz-al; *metrifi-ment

(10) a. government-al; organization-al
    b. formal-ize
    c. metriciz-ation; metrific-ation

The first instance of Merge now involves the merger of a root, by assumption intransitive, with some transitive functor which in turn renders it categorically equivalent, as in (11a). Under the assumption that the relevant functor is a (bound) C-functor, the root would adjoin to it as in (11b):\(^7\)

\[
(11) \quad \begin{align*}
\text{a. } & [C_{x[V]}[\text{r}_\text{Y}^\text{ROOT}]] \\
\text{b. } & [x [\text{r}_\text{Y}^\text{ROOT}]+ [C_{x[V]}][\text{r}_\text{Y}^\text{ROOT}]]
\end{align*}
\]

Under either structure in (11), the relationship between the root and \(C_{x[V]}\) is local, and hence the root can determine the phonological realization of \(C_{x[V]}\). Relative to the possible interpretations of what a phase is, as outlined for structures (4a–c), then, the matter remains undecided. What is clear however is that under any scenario, any element that merges with \(C_{x[V]}\) in (11) can no longer avail itself of any information that is stored with the root, and hence is restricted to a default realization.

In view of this, consider again roots, by assumption phonological indices rather than full phonological realizations. While phonological indices perforce contain much invariable phonological information (and are visible in PF), some facets of root spellout may remain underspecified, so as to allow for the choice of specific allomorphs in well-defined grammatical contexts. Nonetheless, a root must fully spell out no later than within the phase that immediately contains it. Importantly, in the structures in (11a–b), and unless otherwise constrained, such a restriction would

\(^7\) Compounds, representing the merger of two roots, are of interest precisely due to the fact that cases in which roots influence the (idiosyncratic) phonological realization of other roots do not seem to occur. Nor, we note, are they expected if roots are defined as phonological indices. The absence of such effects in compounds, then, lends independent support to the claim that the phonological properties of roots are fundamentally distinct from those of compounds. We note further that the absence of any such effects when two bona fide roots merge also militates against the view of derivational suffixes as roots in, e.g., Lowenstamm (2010) and De Belder (2011).
nonetheless allow the root to spell out within the $C_X[Y]$ domain either before adjoining to the $C_X[Y]$, as in (11a), or after adjoining to it, as in (11b).

In turn, the realization of the root and the C-functor merging with it may display a symmetrical dependency: not only is the choice of C-functor realization dependent on the root, but the root itself may proceed to select its full realization based on the specific choice of C-functor realization. To wit, the root in $in^VDUCE$, having selected /$_n$ment/ as the realization for the $C_N[V]$ merging with it, will proceed to don its /$_n$ment/ garb. Having selected /$_n$+ation/, on the other hand, would bring about the /$_n$induct/ garb, and so on. The realizational dependency, we note, is always local. Beyond the domain of $C_Z[X]$ in (13), no further impact on the form of the root is possible.

In view of this, we already have an answer to one of the questions we presented above. It must be the case that the input to the structures in (4a–c) is an already partially spelled out representation, as in (some version of) (5), for following the merger of $C_A[N]$ in (4); root-stored information is no longer available. Both /$_n$govern/ and /$_n$ment/ are thus fully realized by the time (4a) comes into existence. Phonological realization, therefore, must be incremental. While incremental, however, it nonetheless remains constrained by one of the structures in (4a–c). Specifically, any incremental aspects of phonological realization may only affect the embedded phase as a whole, and cannot access any domain buried, so to speak, within it. To summarize, then:

(14) a. Phonological realization may be incremental;
   b. but is locally constrained (i.e. must target a sister constituent as a whole).

10.1.3 Phases and inflectional allomorphy

Supposing all this to be on the right track, we note an immediate wrinkle. Root allomorphy is not restricted to the C-domain, and is in fact considerably more prevalent in the domain of ExP-segments. As already argued at some length in Chapter 7, stem allomorphs in the context of e.g. English PST are conditioned by strict locality, insofar as they only occur for roots, where, crucially, root-specific information is available. However, under plausible assumptions, there could be any number of (ExP-segment) boundaries separating the root from PST, including, but not limited to, grammatical aspect (g-asp), event structure-related nodes such as ASP, CAUSE, (=v), and others. The structure for what eventually will be spelled out as /$_n$caught/ (e.g. in the telic context caught the ball in two seconds) and preceding any movement is thus at the very minimum as in (15).
Note now that by assumption, the root \(\pi\sqrt{\text{catch}}\) becomes V-equivalent as soon as it merges with the lowest verbal ExP-segment, say \(\text{ASP}_Q\). However, we specifically cannot assume that it is fully spelled out at that point, because the full phonological realization of \(\pi\sqrt{\text{catch}}\) is contingent not only on its V-equivalent status, but also on information provided specifically by the range assignor to (the value that projects as) T. If, however, \(\pi\sqrt{\text{catch}}\) adjoins to \(\text{ASP}_Q\) as in (16a), and then (under a much abbreviated set of ExP-segments) proceeds to adjoin to T, the result would presumably be as in (16b). However, in neither (16a) nor (16b) is there a local relationship between the root and PST, making any statement on root realization in the local context of PST impossible. And yet /\(\pi\)caught/, an attested realization of \(\pi\sqrt{\text{catch}}\), is clearly conditioned by the presence of PST.8

We note in this context that reducing the absence of locality in (16a–b) to phase theory is not a trivial matter. Thus suppose that ExP-segments are phases. If that is the case, then at least under some execution, that would entail that spellout must apply at the edge of \(\text{ASP}_Q\) to the adjoined structure \(\text{ASP}_Q\pi\sqrt{\text{catch}}\). As in English \(\text{ASP}_Q\) does not involve any overt marking, that would give rise, at the edge of \(\text{ASP}_Q\), to /\(\pi\)catch/. As our ultimate goal is to spell out the combination of \(\pi\sqrt{\text{catch}}\) and PST as /\(\pi\)caught/, this execution clearly won’t do. The postponement of spellout, on the other hand, is not a problem in and of itself, precisely because if \(\pi\sqrt{\text{catch}}\) were to adjoin to \(\text{ASP}_Q\) it would be accessible to the next phase (before or after the additional adjunction to PST) and would thus allow spellout to be postponed. However, it would still require the root to select its realization in the context of PST in the boxed constituent in either (16a) or (16b). While the realization would be phase-internal, it would nonetheless not be local, insofar as \(\text{ASP}_Q\) would be intervening between the root and PST. The restrictions on root selection, then, would have to be rephrased as requiring not locality, but rather phase-internal realization.

Alas, relaxing locality so as to allow a dependency between the root and PST in either version in (16) would summarily do away with whatever advantages were gained by locality within the domain of C-functors. There is no formal distinction between the boxed structures in (16) and the schematic structures in (13a) and yet, as

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8 I am excluding without further discussion the possibility that the phonological contingency relationship between the root and PST can be stated directly on the pre-movement structure (e.g. as in (i)), and without local relations altogether (e.g. as a case of phonological Agree).

(i) \(\text{[T PST [\text{ASP}_Q DP [C=V \pi\sqrt{\text{catch}}]]]}\)

Here, as elsewhere, I am assuming that tense realization in English is the result of movement. In attempting to reconcile the absence of V-to-C in English as well as the obligatoriness of do-insertion for negation, one may opt for a number of executions, of which the most obvious would be to assume two instances of T, alongside the assumption that it is the movement to the higher one that is licit for auxiliaries but blocked for lexical verbs (see, in this respect, Bobaljik and Jonas 1996).
exemplified by (13c), the realization of the root in such structures cannot be impacted
by $C_{Z[i]}$, an impossibility that was attributed to locality conditions.\footnote{Note that the assumption that ExP-segments are not phases would not solve the problem precisely because head adjunction should allow for "phase extension", making the question of whether ExP-segments are phases or not orthogonal to the definition of locality here. Conversely, the assumption that ExP-segments are not phases would run afoul of the restriction on en-searching which bars it from extending beyond the domain of the first ExP-item. The latter restriction, as already discussed in Chapter 9, section 3.6, forced a derivation-based incremental en-searching, and insofar as en-searching is contingent on spellout, incremental spellout as well. It is within that domain, then, that some notion "phase" appears best motivated, and that phase is clearly defined on ExP-structure of some sort.}

A solution for the locality problem presented by (16) is straightforwardly available, however, if we re-evaluate the structure in (16). More specifically, if we assume, as already argued independently in this work, that the term “inflection” is but a name for a mode of phonological realization that is associated with the re-merger and re-projection of a C-core as a succession of ExP-segments which come to acquire semantic values in conjunction with abstract S-functors. From the perspective of such an execution, and considering again some Extended Projection consisting, at the very least, of $\{\text{ASPQ}[V], \text{PST}[V]\}$, the actual structure that would give rise to $\_\pi\text{caught}/$ would not involve adjunction, (16), but would rather be as in (17):

\begin{equation}
(17) \quad \left[\begin{array}{l}
T \\
\text{PST}^T
\end{array}\right] \ll \left[\begin{array}{l}
C=V \sqrt{\text{CATCH}^{\text{Q,PST}}}
\end{array}\right]_T \quad \left[\begin{array}{l}
\text{ASP}_Q
\end{array}\right] \quad \left[\begin{array}{l}
\text{DP}^Q
\end{array}\right] \ll \left[\begin{array}{l}
C=V \sqrt{\text{CATCH}^Q}
\end{array}\right]_{\text{ASP}_Q}
\end{equation}

Within the representation in (17), the V-equivalent constituent, $\left[\begin{array}{l}
C=V \sqrt{\text{CATCH}^{\text{Q,PST}}}
\end{array}\right]$, having re-merged and projected successively up the ExP-ladder as $\text{ASP}_Q$ and then as $T$, has come to acquire the (unordered) features $\{\text{Q,PST}\}$, although its structural complexity has not increased. The specific form to be spelled out as the output of the derivation in (17) is thus as in (18). For the purpose of realizing phonologically the boxed constituent in (18), however, access to root-specific information is entirely straightforward (as it would be even if $\left[\begin{array}{l}
C=V \sqrt{\text{CATCH}}
\end{array}\right]$ had passed through more projections and had acquired more features). The reason is that complexity has not been added, and the representation contains no terminals or brackets intervening between the root and its sister. In turn, however, that the root has come to acquire some diacritics may impact its realization. It should present little problem, then, to consult the relevant phonological entry to return the correct form of the root as $\_\pi\text{caught}/$ in the following context (and note that as there is no phonological realization information associated with the feature Q in English, we are free to assume that no root makes reference to it):

\begin{equation}
(18) \quad \left[\begin{array}{l}
C=V \sqrt{\text{CATCH}^{\text{PST}}}
\end{array}\right] \rightarrow \_\pi\text{caught}/
\end{equation}

We note, for completeness, that the derivation in (17) involves the movement of the C-core, and that the C-core need not be a root. On a par with (18) we could also have (19). Like $\left[\begin{array}{l}
C=V \sqrt{\text{CATCH}}
\end{array}\right]$, $\left[\begin{array}{l}
V \sqrt{\text{PATRON}}\text{ize}
\end{array}\right]$ would also come to be marked by its derivational history. However, $\left[\begin{array}{l}
V \sqrt{\text{PATRON}}\text{ize}
\end{array}\right]$ is not a root, and access to privileged spellout information would not be available. The default spellout for the boxed constituent in (19) would thus, perforce, be $\_\pi\text{patronized}/$.\footnote{More accurately, and if, as I will argue directly below, C-merger effectively defines a spellout phase, then it follows that $\_\pi\text{patronize}/$ will have been spelled out as such prior to its re-merger in T. Little, we note,
If the execution in (17) is on the right track, then root-contained information may remain available up the ExP-ladder, providing, of course, that the root itself is not embedded within a more complex C-core. As is patently obvious, such an execution also allows us to continue to maintain that every instance of Merge, be it a C-functor or an ExP-segment, is a phase. The difference in the applicability of locality conditions, in turn, follows not from the presence or absence of phases as such, but rather from the formal distinction between C-functors and ExP-segments, such that the latter have open values as heads, but not so the former. More concretely, we note that if realization within the C-domain is strictly by phase, the correct results directly emerge, giving rise, correctly, to incremental realization. Within an inflectional Extended Projection, however, and given the availability of open values as heads, re-merger and re-projection are possible when S-marking involves an abstract operator. It is, in turn, precisely such re-merger and re-projection that allows for the extension of the realization domain, insofar as it does not interfere with the local relationship between a root and PST and thereby allows the realization of the former to be contingent on the presence of the latter.

We note now that for the execution to work, and continuing to assume that every instance of Merge, including that involving ExP-segments, is a phase, it is necessary to assume that while spellout may be obligatory, within each individual phase it may remain optional, a conclusion which is certainly consistent with the logic of Phase Theory. Viewed from the opposite perspective, we note that there is little to force the realization to wait, so to speak, until T, and rather, we expect it to be possible for √catch to be realized in the context in (20), presumably as √catch/. Subsequent to such realization, however, matters become tricky. If our fully realized √catch now proceeds to re-merge as T, it would give rise to a phonological mismatch. If, on the other hand, it fails to re-merge as T, the derivation could only be licit if PST can be phonologically otherwise supported. Such support could be available (e.g. in the form of the auxiliary DO or a modal), but at some interpretational cost, insofar as a modal as well as DO in such a context would be S-functors in their own right. The latter in turn is exactly the derivation of English future, as in (21). To complete the picture, we note that in e.g. (21), the realization of T, whatever it may be, cannot possibly be affected by root-internal information, nor can the realization of the root be impacted by the structural or phonological properties of FUT. The realizational properties we are talking about here thus do not distinguish the C-system from the S-system as such. Rather, they distinguish between modes of realization. Insofar as in the absence of open values re-mergers are impossible within the C-system, inflectional realization modes are absent. When the S-system involves overt S-functors rather than abstract ones, however, locality effects, however derived, are as robust within the Extended Projection as they are within the C-system:

(19) \([√catch] \rightarrow √catch\)

hangs on this detail for this specific execution, precisely because past the merger of ize, all subsequent mergers do not add structural complexity.
In a nutshell, and summarizing the differences between the S-system, the Extended Projection, and the C-system, we have now derived the following generalizations (and note that the precise structural domain of a phase is still pending, cf. (4a–c) and related discussion):

(22) a. Domain extension is (in principle) possible within an Extended Projection.  
    b. Domain extension is not possible within the C-system → every phase defines an absolute spellout domain.

10.1.4 The pieces—how tight the fit?

Consider again AS-nominals. Recall that rather crucially, I assumed that en-searching, in AS-nominals, cannot cross ExP-items, thereby accounting for the obligatory compositionality of AS-nominals. As it turns out, however, some locality effects from roots are present in AS-nominals nonetheless, although they involve spellout, rather than Content. Thus phonological root selection clearly is available in AS-nominals. There is no difference in the realization of $C_{N[v]}$ between R-nominals and AS-nominals, insofar as the spellout of the derived nominal itself would be referral or adherence in an identical fashion in R-nominals and in AS-nominals, clearly an instance of root selection. Nor would globalization or civilization spell out differently as depending on whether they correspond to atomic Content or not. In all these cases, it appears, it remains the case that it is adjacency to the root that is the best predictor of C-functor spellouts, regardless of compositionality and regardless of AS- or R- structures.

But if the execution in (17) is adopted, it remains entirely possible for a root to exercise local selection on the realization of $C_{N[v]}$ in AS-nominals! Specifically, as a result of this execution, the adjunction of any V-equivalent constituent from within a verbal projection onto a dominating C-functor would give rise to the representation in (23), where the root is adjacent to the realized C-functor, and where, as a consequence, it may influence its spellout, e.g. as /πance/:
As the astute reader may recall, structures such as those in (23) were already noted previously, and specifically, in section 3.6 of Chapter 9. In fact, it was exactly such structures that motivated the derivational, and hence fundamentally phase-based, approach to Content matching. Specifically, there are no ExP-segments or brackets intervening between the (V-equivalent) root and the C-functor in the adjoined, boxed part of the structure in (23). If Content matching were based on representations alone one would have expected, incorrectly, possible atomic Content for the boxed constituent in (23). It is precisely the absence of such atomic Content that motivated Content matching earlier on, at the merger of the first ExP-item and hence a derivation-based approach.

We note that, in and of itself, the movement depicted in (17) and (23) together with the domain extension that it accomplishes indicate that an amorphemic approach to inflection is not only parsimonious, as already noted in Chapters 1 and 6, and as amply discussed in Anderson (1982, 1992) and in Beard (1995), but inevitable within a syntactic approach, if we are to give a coherent account of the retention of the locality effects of the root within Extended Projections, but not within the C-domain. It emerges equally forcefully that any account which seeks to model word formation within the syntax must make a formal in-principle distinction between the behavior of C-functors on the one hand, and the behavior of both S-functors and the ExP-segments that they assign range to, on the other. Whatever the properties of $C_{N[V]}$, such that we may spell it as /ˈæʃaʃən, ˈænts, ɔl, ˈmɛnt/ etc., they are formally distinct from those of T, or D, or PL/CL, or similar. We do note that it remains possible that $C_{N[V]}$ is formally akin not to T or to D, but rather to the entire set of ExP-segments available in the context of any C-core; i.e. it is formally equivalent to $\{Ex[V]\}$ or $\{Ex[N]\}$ etc. Importantly, however, the formal consequences of equating C-functors with Extended Projections as complete sets are radically different from those of equating C-functors with, e.g., PST or PL/CL. Thus even if Extended Projections as a whole are formally equivalent to C-functors, it remains the fact that e.g. PST or PL/CL, as such, cannot be “morphemes” in the same sense that e.g. ABLE, or ING, or ATK are.

It further emerges that the distinct pieces of the puzzle which have been painstakingly independently motivated throughout this book not only fit together, but fit together in an inevitable, deterministic fashion. If, as we claim, en-searching cannot cross an ExP-item, however defined, then the obligatory, systematic compositionality of AS-nominals strongly supports (although falls short of entailing) the presence of ExP-segments in such nominals vs. their absence in R-nominals. If AS-nominals contain ExP-segments, then it is inevitable that movement of the C-core through such ExP-structure cannot yield increased structural complexity, as an increased structural complexity would yield a non-local relationship at the adjunction site in structures such as (23), making root selection for the realization of $C_{N[V]}$ impossible. From these very factors it also emerges that a derivational execution, at least to Content, is inevitable, precisely because the relevant distinction between AS-nominals and R-nominals cannot be made once the representation in its entirety is taken into account. We now note that if movement and re-projection of the C-core through ExP-segments does not bring about an increase in complexity, but movement to (adjoin to) C-functors does, then
we must make a formal distinction between C-functors, on the one hand, and
ExP-segments and the (abstract) S-functors that assign range to them, on the
other, thereby reaching the conclusion that inflection cannot be morphemic, but
the C-functor system must be.

(24) En-searching cannot cross ExP-item (strongly points towards)
   AS-nominals include ExP-segments  \rightarrow
   Movement through ExP-segments cannot increase structural complexity  \rightarrow
   Content (and possibly spellout) is delimited by phase  \rightarrow
   Inflection is amorphemic; C-functors are morphemic

It thus emerges that in what may appear, at first sight, as two entirely unrelated
statements, the first in actuality entails the second, as in (25a). While (25b) falls short
of a full entailment, it is, nonetheless, a strong correlation which cannot possibly be
coincidental:

(25) a. AS-nominals include ExP-segments  \rightarrow Inflection is amorphemic; C-functors
    are morphemic
   b. En-searching cannot cross ExP-item (just about) entails that Inflection is
      amorphemic; C-functors are morphemic

What does nevertheless emerge from the previous discussion is the existence of
differences between the domain of en-searching and the domain of phonological
realization. The interaction between the domains for spellout and the domain for
en-searching, as well as the final formal definition of such domains, is the subject
matter of the remainder of this chapter.

10.2 Content and Spellout—an Interaction

Insofar as every instance of Merge creates a phase, and bearing in mind that Content
matching is optional, the matching of Content by phase within the C-core domain may
proceed along the very same route already sketched in Chapter 9, section 3.2. Suppose,
concretely, we consider again the derivation of activism and naturalize the latter, recall,
under the reading of BECOME-CITIZEN. First Merge—and first phase—Involves
\(n^{\pi}_{ACT}\) and \(C_{A[V]}\). \(n^{\pi}_{ACT}\) will become V-equivalent, by assumption, in the context of
\(C_{A[V]}\), and thus \([_{C=V}n^{\pi}_{ACT}]\). The emerging representation is as in (26i). We note now that
\(n^{\pi}_{ACT}\), in isolation, could never be an appropriate target for en-searching as it is not a licit
syntactic object. It thus emerges that roots, away from structural configurations, could
never be matched with Content. Once \(n^{\pi}_{ACT}\) merges with \(C_{A[V]}\), however, it not only
becomes an appropriate syntactic object, it also becomes V-equivalent. Insofar as
\([_{C=V}n^{\pi}_{ACT}]\), in e.g. active is matched with Content, then, it can only do so within the
phase that immediately dominates it, a conclusion that we reached similarly in our
discussion of the spellout properties of governmental (cf. (3)–(4) and related discussion).
For concreteness’ sake, suppose we allow \([_{C=V}n^{\pi}_{ACT}]\), by virtue of carrying a phonological
index, to be an appropriate target for en-searching within the phase that immediately
dominate it, and specifically within the structure in (26i), thus returning the Content
ACT. We note, as already discussed in the context of (4a), that the constituent \([C_A[V] \{C=V^\pi\sqrt{\text{ACT}}\}]\) in (26i) is not en-searchable, even if \(C_A[V] \) is spelled out as /ive/, because \(C_A[V]/\text{ive}^\pi\) and \([C=V^\pi\sqrt{\text{ACT}}]\) are not ordered, and by assumption, an unordered pair is not a licit phonological representation and thus cannot be en-searched. No such problem faces the matching of \([C=V^\pi\sqrt{\text{ACT}}]\), alone, with Content. Nor is linearization a concern in LF, we note, and hence we may now assume that the representations in (26i)–(27i) are what is shipped to LF, so as to yield, in the case of (26i), whatever semantic computation may be associated with the abstract structure \([C_A[V][V]].\n
Because Content matching is optional, consider a derivation in which no Content was matched with \([C=V^\pi\sqrt{\text{ACT}}]\) in (26i). In fact, when we consider naturalize, we note that the first possible en-search would target \([C=V^\pi\sqrt{\text{NAT}}]\) (rendered V-equivalent by \(C_N[V]\), as in (27i). There is, however, no Content on file for \([C=V^\pi\sqrt{\text{NAT}}]\), a matter, in and of itself, unproblematic precisely because Content matching is optional. We note, in both cases, that neither \([C=V^\pi\sqrt{\text{NAT}}]\) nor \([C=V^\pi\sqrt{\text{ACT}}]\) are fully spelled out in (26i) and (27i), and that en-searching is presumed possible on the basis of phonological index alone. I return below, in section 10.3 to the rationale for this claim. We may now assume the configuration in (26i)–(27i).

Content, recall, is matched with phonological strings and thus the next possible (phonologically distinct) en-searchable string must involve an already spelled out instance of \(C_A[V]\) (for activism) or \(C_N[V]\) (for naturalize). Such spellout, in turn, is crucially contingent on linearization and hence requires adjunction and the ordering of the root and the functor relative to each other. It thus emerges that the next phonologically distinct domain would be the boxed representations in (26ii) and (27ii), where the relevant functors are spelled out, possibly on the basis of root-stored information. Note now that within the boxed constituents in (26ii)–(27ii), the root has yet to fully spell out and that, as in the case of (26i)–(27i), the assumption is that phonological indices, as such, are en-searchable. As it turns out now, for the box in (26ii) no Content is available on file (there is no atomic Content ACTIVE in English). Atomic Content could, however, be returned for the box in (27ii), namely NATURE. That Content, too, is optionally matched:

<table>
<thead>
<tr>
<th>(26)</th>
<th>en-search</th>
<th>CONTENT 1</th>
<th>CONTENT 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>i.</td>
<td>([C_A[V] {C=V^\pi\sqrt{\text{ACT}}}])</td>
<td>ACT</td>
<td>ROOT+C</td>
</tr>
<tr>
<td>ii.</td>
<td>([A {C=V^\pi\sqrt{\text{ACT}}}+/\text{ive}^\pi])</td>
<td>ACT</td>
<td>(\emptyset) (no atomic Content on file)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>(27)</th>
<th>en-search</th>
<th>CONTENT 1</th>
<th>CONTENT 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>i.</td>
<td>([C_N[V] {C=V^\pi\sqrt{\text{NAT}}}])</td>
<td>(\emptyset) (no atomic Content on file)</td>
<td></td>
</tr>
<tr>
<td>ii.</td>
<td>([N {C=V^\pi\sqrt{\text{NAT}}}+/\text{ure}^\pi])</td>
<td>(\emptyset)</td>
<td>NATURE</td>
</tr>
</tbody>
</table>
Note now that in (26ii)–(27ii), the en-searched constituent may or may not include the outer category label (A or N, respectively). Specifically, note that the constituent \([\lambda [C=V^{\pi}\sqrt{\text{nature}}]+/_{\pi}\text{ure}/]\), with /_{\pi}\text{ure}/ [the spellout of \(C_N[V]\)], is a well-formed syntactic constituent consisting of \([\lambda [C=V^{\pi}\sqrt{\text{nature}}}]\) and the C-functor that merges with it, and that phonologically, it returns a unit that can be successfully en-searched, returning the atomic Content \(\text{NATURE}\). That, specifically, is not the case for (26i)–(27i), where there is simply no way to en-search the root unless it merges with a functor and is rendered categorially equivalent. The interesting and non-trivial result that emerges is that roots can only be en-searched when categorized and labeled, but not so larger constituents. I return to this matter in section 10.5.11

Consider now the next step of the derivation, i.e. the next instance of Merge. It is at that point, I suggest, that the root fully spells out (cf. (26iii) and (27iii), including choice of allomorph, if relevant for the root (e.g. \(\text{induct-ive}\)). LF computation, we note, is possible on the basis of these structures, precisely because linearization is irrelevant at LF and we may thus assume that the structures shipped to LF at that point indeed do receive an interpretation, and a necessarily compositional one. By the rationale already outlined, however, ordering and hence adjunction are necessary both for the spellout of the merging C-functor, and hence for any additional en-searching operations, if any are to take place. Any such en-searches, on the adjunction structures in (26iv) and (27iv), are in turn contingent on the failure of any Content to have been previously matched with the C-core, as Content, recall, cannot be overridden, and once e.g. \(\text{ACT}\) is in place, all further meaning is perforce compositional. By the optionality of Content, we note, Content may always simply fail to be assigned altogether:12

<table>
<thead>
<tr>
<th>(26)</th>
<th>(\text{en-search})</th>
<th>CONTENT 1</th>
<th>CONTENT 2</th>
<th>CONTENT 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>ii.</td>
<td>([\lambda [C=V^{\pi}\text{ACT}]+/_{\pi}\text{ive}/])</td>
<td>(\text{ACT})</td>
<td>(\emptyset) (no atomic Content on file)</td>
<td></td>
</tr>
<tr>
<td>iii.</td>
<td>(\text{ISM}<em>{N[A/N]}[\lambda /</em>{\pi}\text{active}/])</td>
<td>(\text{ACT})</td>
<td>(\emptyset)</td>
<td>(\emptyset)</td>
</tr>
<tr>
<td>iv.</td>
<td>([N[A/<em>{\pi}\text{active}/]/</em>{\pi}\text{ism}/])</td>
<td>(\emptyset)</td>
<td>(\emptyset)</td>
<td>(\text{ACTIVISM})</td>
</tr>
</tbody>
</table>

11 Roots can be searched when bracketed, but not labeled, but only within compounds. See section 10.5.

12 Note that if e.g. \(\text{nature}\) fails to be matched with Content in (27ii), it may still be matched with Content in (27iii) in the context of the phase that contains it. As Content matching with (27ii) (to yield \(\text{NATURE}\)) is clearly necessary when \(\text{nature}\) fails to undergo any additional derivational processes, we must allow for a phase-internal Content matching as well as for Content matching in a higher domain. The apparent redundancy is made necessary by the fact that Content may only be matched with syntactic constituents, and that roots, in isolation, are not constituents and only become so in the context of a containing phase. I leave the resolution of this duality, if it is indeed in need of such resolution, to future refinements.
(27) en-search

<table>
<thead>
<tr>
<th>CONTENT 1</th>
<th>CONTENT 2</th>
<th>CONTENT 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>C-EUIV.ROOT</td>
<td>ROOT+C</td>
<td>[ROOT+C]+C</td>
</tr>
</tbody>
</table>

ii. $[\lambda]_{[\sqrt[\pi]{\text{nature}}]+/\text{ure}/}] \emptyset \quad \text{NATURE}$

iii. $C\lambda_{[\sqrt[\pi]{\text{nature}}/]} \emptyset \quad \text{NATURE} \emptyset$

iv. $[\lambda_{[\sqrt[\pi]{\text{nature}}/\pi\text{ural}]}/] \emptyset \quad \text{NATURE} \emptyset$

For naturalize, an additional instance of Merge would give rise to (27vi):

(27) en-search

<table>
<thead>
<tr>
<th>CONTENT 2</th>
<th>CONTENT 3</th>
<th>CONTENT 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>ROOT+C</td>
<td>[ROOT+C]+C</td>
<td>[([ROOT+C]+C]+C)</td>
</tr>
</tbody>
</table>

v. $C\lambda_{\psi_{[\sqrt[\pi]{\text{natural}}]}} \quad \text{NATURE} \emptyset \emptyset$

vi. $[\lambda_{\psi_{[\sqrt[\pi]{\text{natural}}]}/\pi\text{ize}]/] \emptyset \emptyset \quad \text{BECOME-CITIZEN}$

Finally, and because en-searching is stopped by ExP-items (however defined), should e.g. editorialize be embedded under T or re-merge as T, any such additional structure, and regardless of its potential spellout consequences, would not be available for any further en-searching.

Suppose we pause to consider the workings of the above derivations from the perspective of phases. Effectively, I suggested that a phase, in the relevant sense, consists of a merging head and the domain that it merges with. It was thus in the context of a merging functor that the root could become en-searchable in (26i) and (27i), and it was in the context of a merging functor that the root was fully phonologically realized, as in (26iii) and (27iii). This conclusion, in turn, is directly corroborated by realizational effects, where, likewise, it was the merger of a head that triggered the full realization of its complement domain.

When viewed from the perspective of Bare Phrase Structure, now, we note that the conclusion is simply inevitable. Specifically, within BPS, maximal projections, as such, are derived, and can only be defined from without. Specifically, X is maximal if and only if it merges with Y, and Y, rather than X, projects. Conversely, X is not maximal if it merges with Y and projects itself. Finally, absent Y of any sort, X is maximal. Any attempt to define “phase” as based on a maximal projection, then, would flounder because within a derivational execution, and given an output string such as that in (8), at the relevant point of the derivation each instantiation of X and Y was the maximal instantiation of its type:

(28) $[y \text{ BP } [y \text{ AP } [y \text{ MP } [x \text{ WP } [x \text{ ZP } [x}$

It thus emerges that equating phases with a maximal projection is fundamentally representational, and as such is not truly coherent with a derivational approach that is based on some articulation of Bare Phrase Structure. Rather, the best characterization of a “phase” is one that involves a head-complement configuration. From a derivational perspective, in turn, this supports the emergence of a phase at every instance of projecting Merge, as now defined in (29). Harking back to the discussion in section 10.1.1 and the structures in e.g. (4a–c), it emerges that it is precisely the
merger in (4a) that creates a phase, and the adjunction movement which gives rise to (4b–c) is phase-internal and is motivated by the need for linearization:13

(29) a. \( \alpha \) is a phase iff there is \( \alpha^{\text{min}} \) such that \( \alpha \) is a projection of \( \alpha^{\text{min}} \) and \( \alpha \) immediately dominates \( \alpha^{\text{min}} \).

b. Phase Impenetrability Condition:

In a configuration \([\alpha [\beta \beta^{\text{min}}] ]\), where \( \alpha, \beta \) are phases, \( \beta^{\text{min}} \) is accessible to operations within \( \alpha \).

With the phases and the domain of Content thus articulated, we note now that there are some mismatches between the domain of spellout and the domain of Content. Specifically, it appears that spellout must proceed strictly by phase, but Content allows domain extension. Furthermore, while ExP-items block en-searching, they do allow, under certain conditions, a domain extension for phonological realization:

(30) | for spellout | for en-searching |
---|---|---|
ExP-items | (may) allow phase extension | are absolute boundaries |
C-functors | obligatory spellout domain | optional Content domain |
phase-extension impossible | phase-extension possible |

We note before proceeding that the mismatches concern, specifically, spellout and en-searching, and not, e.g., movement. Rather, when it comes to movement the domain defined by C-functors and the domain defined by ExP-items are identical and both allow movement in an identical fashion. Thus, crucially, movement of the C-core to adjoin to \( C_N[V] \) in AS-nominals is possible. The mismatch, rather, arises from the fact that the output of such movement is a licit local domain for spellout, but not for Content matching.

The empirical effect of the mismatches is to make the domain of phonological realization a subset of the domain of Content within the C-core, but to make the phonological realization domain a superset of the domain of Content once Extended Projections appear on the scene. Before proceeding, we note that such systematic, structurally describable mismatches between the domain of Content and the domain of phonological realization, much as they are in need of explanation, are in and of themselves an extremely strong argument against lexicalist approaches. Insofar as such approaches are based on the assumption that there is a unified domain for Content and phonological realization which is fundamentally linked to some listed

13 A few notes are in order relative to the definition in (29). We note, first, that the availability of the “edge” of \( \beta \) follows directly from dispensing with the notion that phases must be maximal projections. We note further that the definition remains somewhat vague as to the status of \( \alpha^{\text{min/max}} \), insofar as self-domination is certainly a formally coherent notion. What is at stake is whether e.g. a root constitutes a phase, or whether a C-terminal such as \( C_N[V] \) can, in and of itself, be a phase. For the latter case, we note, the empirical consequences are rather hard to determine. For the former, the text execution suggests, at the very least, that a root is en-searchable once categorized, and hence, potentially, a phase. The matter is left intentionally open here, in the hope that it is, indeed, an empirical issue and that relevant data could be brought to bear on it.

We note finally with some degree of irony that the phase domain, as it emerges from our discussion and from the definition in (29) comes extremely close to the erstwhile domain defined by government.
lexeme, and especially when augmented by the claim that inflection and derivation are formally identical, such mismatches simply cannot be captured.

As it turns out the strongest evidence for some divergence between the domain of Content and the domain of realization as well as for the articulated syntax within which they are assigned comes from mono-morphemic forms: that is, where they would be, prima facie, least expected. Recall that rather crucially, Content matching is sensitive to phonological realization, and thus /\_transmission/ as CAR GEARBOX, but not /\_transmittal/. Interestingly enough, however, the assignment of Content on the basis of fully spelled out strings would give exactly the wrong results when it comes to allomorphs and inflection. Specifically, insofar as e.g. /\_catch/ and /\_caught/ have an identical Content, such Content can be sensitive neither to the inflectional information associated with either, nor to the actual phonological string that may result.

It thus emerges that while the spellout of /\_caught/ cannot exist as such prior to the merger of \([_{\text{\,C=V\,}}}\_\text{\,catch\,}]/ with PST (cf. (17)), by the time \([_{\text{\,C=V\,}}}\_\text{\,catch\,}]/ or more accurately \([_{\text{\,C=V\,}}}\_\text{\,catch\,}^{0\text{-PST}}]/ does spell out, it must already have Content. Clearly, then, there has to be a unit of representation which contains sufficient phonological information such that it could underlie what would, eventually, become /\_catch/ or /\_caught/ respectively, but which is nonetheless still sufficiently underspecified to allow for a uniform en-search for both forms to return, in both cases, CATCH. Within lexicalist approaches, such a unit would be a lexeme, where it would be stated, directly, that the Content CATCH could be realized as either /\_catch/ or /\_caught/ respectively, but which is nonetheless still sufficiently underspecified to allow for a uniform en-search for both forms to return, in both cases, CATCH. Within lexicalist approaches, such a unit would be a lexeme, where it would be stated, directly, that the Content CATCH could be realized as either /\_catch/ or /\_caught/ respectively, but which is nonetheless still sufficiently underspecified to allow for a uniform en-search for both forms to return, in both cases, CATCH. Within approaches that allow roots to have Content but no phonology, on the other hand, the commonality of Content would need to be stated on a root \(\_\text{\,catch\,}]/ which would otherwise be devoid of phonological information. The drawbacks of such approaches were likewise discussed already (see sections 2–3 of Chapter 8), where we pointed out that such approaches can capture neither the rarity of root suppletion nor the atomic Content that could be associated with /\_catchment/ or with /\_catchy/ and which is entirely unrelated to that of /\_catch\,\,(to)/ catch/.

Finally, within the syntactic approach outlined here, where roots are specifically packets of phonological information, phonological indices which are nonetheless not necessarily fully spelled out, the commonality of Content between /\_catch/ and /\_caught/ can be directly captured without assuming root-based Content or lexemes, if we assume that en-searching is delimited by ExP-items, and that phonological indices, roots, are sufficiently phonologically unique to allow for successful en-searching. In reference to the derivation in (17) repeated here as (31), and with (upper) phase boundaries marked as \(<\), we note, specifically, the final chance for en-searching, vs. the domain extension licit for root selection and root spellout (but see directly below in (33) for some important refinements of the domain in which Content is assigned to \(\_\text{\,CATCH\,}]/):

\[
(31) \quad \begin{array}{c}
\text{T} \rightarrow \text{PST} \ll [_{\text{\,C=V\,}}\_\text{\,catch\,}^{0\text{-PST}}]/_{\text{\,ASP\,}} \Downarrow \left[_{\text{\,ASP\,}} \downarrow \right]
\end{array}
\]

\[
(\_\text{\,catch/})
\]
The conclusion that thus emerges, note, does not just serve to help articulate the domains of Content and spellout. Rather, it points yet again to the inevitability of a derivational, phase-based approach to complex words.14

10.3 The Domain of Content—Final Refinements

Before reaching any final conclusions on the mismatches in (30), a better understanding of ExP-items is central, as it is only when armed with such an understanding that the precise domain of Content can be described.

Suppose, then, we take as our starting point the definition of phase in (29), and investigate its applicability to the derivation in (31). Crucially, and as already discussed, $\sqrt{\text{catch}}$ is not, in and of itself, a well-defined syntactic object, and hence cannot be matched with Content. Rather, the minimal syntactic constituent within which it could be assigned such Content requires that it merge with ASP$_Q$ or some other member of $\{\text{Ex}[V] \}$. Nonetheless, and taking a leaf from the matching of Content with $[C=V\sqrt{\text{act}}]$ in (261), Content, or so it would appear, should be available for the boxed constituent in (32), quite independently of whether or not it constitutes a phase (see fn. 13):

(32) $[\text{ASP}_Q \text{DP}^0 (\square)[C=V\sqrt{\text{catch}}]]$

There is, however, a crucial difference between (26) and (32). In (26), $\sqrt{\text{act}}$ merges with $C_{A[V]}$, itself a member of the numeration, an instance of external Merge. In (32), however, this is not the case. Rather, the only form of merger that could lead to the projection of ASP$_Q$ in such structures, given the absence of an S-functor, and range assignment from the DP specifier, involves the re-merger and re-projection of $\sqrt{\text{catch}}$. In fact, categorization itself, for $\sqrt{\text{catch}}$, can only emerge here post-re-merger, giving rise to the structure in (33):

(33) $[\text{ASP}_Q \text{DP}^0 (\square\square)[C=V\sqrt{\text{catch}}] \Rightarrow_{\text{ASP}_Q} [C=V\sqrt{\text{catch}}] ]$

As (33) is the first en-searchable domain, and as silent copies cannot serve as an input to en-searching, it emerges that any attempt to assign Content to $[C=V\sqrt{\text{catch}}]$ must take as its input the boxed constituent, and that boxed constituent perforce includes an “ExP-item”, i.e. the value to be projected as ASP$_Q$ in conjunction with the head $[C=V\sqrt{\text{catch}}]$, i.e. $\llbracket C=V\sqrt{\text{catch}} \rrbracket$. It thus emerges that while constituents that contain bare roots may be, at least in principle, matched

14 Embick (2010) reaches a similar descriptive conclusion, delimiting the domain of Content by contextual allomorphs, which he takes specifically to apply within what we refer to, here, as ExP-segments, but not within the C-domain (e.g. catch/caught, but not destroy/destruct(ion)). The convergence of the conclusions is telling, but a detailed comparison of the systems is rendered rather difficult as Embick’s execution presupposes syntactic adjunctions as well as zero-realized affixes, together with extensive readjustment rules, all of which are dispensed with in the system put forward in this work.
with atomic Content within the C-core, that option is not available when roots merge with ExP-segments, and where Content, perforce, must include a bigger domain.

A number of interesting and non-trivial results emerge. First we note, "ExP-item" as in (7iv) cannot possibly be in reference to a head of an ExP-segment. Rather, and insofar as ExP-items do define a final domain for Content matching, the relevant item must be the first ExP-phase, i.e. the first non-minimal instantiation of ASP$_Q$, as in (34iii) (and see section 10.5 on the labeling issue in (34i)):

(34)  **En-searching, final**

i.  En-searching operates by phase on (labeled) bracketed phonological strings.

ii.  The en-search domain must include a C-core.

iii.  Content is assigned optionally but once assigned, cannot be overridden.

iv.  ExP-phase marks a final Content domain.

Second, we note, the derivation in (33), and our conclusion concerning the correct characterization of ExP-items, lends even stronger support to defining phases not in terms of maximal projections, but in terms of head Merge. Lastly, we now predict that e.g. Q-marking, as in (33), or for that matter any S-marking associated with the lowest ExP-segment, may impact Content, precisely because its phonological properties could be included in the en-searched string. Not so, however, any phonological realization associated with higher ExP-segments, which are, by definition, excluded from the innermost ExP-phase, by assumption the final domain of Content.

This prediction, by no means a trivial one, is in turn directly confirmed. Rarely, if ever, do numbers, quantifiers, or indeed articles, combine to a larger constituent with atomic Content. Plural marking, however, is regularly implicated in the emergence of exactly such Content in a broad number of languages (including Hebrew and English), in the form of *pluralia tantum*. One would be rather hard-pressed to claim that e.g. *glasses* is compositionally derived from *glass*, or *briefs* from *brief* (in its nominal or adjectival use). Rather, these are clearly cases where en-searching should be allowed to match distinct Content from that of *GLASS* or *BRIEF* with the strings */g glasses/* and */b briefs/*. Adopting the nominal structure in Borer (2005a), plural marking is an instance of DIV$^{CL}$, a range assignor to $<<e_c, e_n, C_k>>$ and is thus the lowest instance of $\{\text{Ex}[N]\}$ which directly merges with the C-core. As argued in Borer (2005a), the very same function is shared by classifiers in classifier languages, as well as by diminutives, in e.g. Dutch and German. As is well known and well documented, classifiers and diminutives, just like plural marking, but quite distinct from determiners, agreement, or tense marking, do impact Content, as is briefly illustrated in (36):\(^{15}\)

---

\(^{15}\) The generalization, we note, cannot be reduced to the affixal nature of the relevant marking (e.g. English plural) in contrast with the free morphemes marking definiteness and quantification in English. In Semitic languages, the definite article is a prefix, and yet a non-compositional reading is impossible. Similarly, telicity marking may give rise to non-compositionality (e.g. in Slavic; see below), but tense or g-asp marking never do, regardless of their frequently affixal nature.

Proper names with definite articles (in grammars that otherwise do not require them) such as *the Bronx*, or *La France* may appear as a counter-example. Note, however, that insofar as common names with distinct Content are not available for such expressions, the claim that they are not compositional is
(35) \[ D \ [\# \ [CL \ \ll e \gg \ [CL \ [C=N \ \ldots \ ] ] ] ] ] ]
plural marking
diminutives
classifiers

(36) a. glasses; briefs; rapids
b. tienwoe ki tienwoe tung [Cantonese]
telephone long telephone through
‘telephone wire’ ‘telephone call’
‘telephone’ (instrument)
c. eten eten-tje [Dutch]
food eat DIM
‘food’ ‘dinner’

Nor is the phenomenon restricted to the nominal domain. Within the verbal domain, Q-marking as well may impact Content. Thus Slavic perfective prefixes notoriously impact Content. A Polish stem such as czytać would have the Content READ when occurring in isolation as well as in the presence of the perfective prefix prze(-czytać). When occurring with other prefixes, however, it may have the Content PRESENT (od-czytać), DECODE (roz-czytać), or UPLOAD (w-czytać) (all cases from Lazorczyk 2010). If, as is argued in some detail in Borer (2005b) (and see also Chapter 2, section 3) telicity inducing structure, ASPQ, is the first merging instance of \{Ex[V]\}, and if as is likewise argued in Borer (2005b) as well as in Lazorczyk (2010), perfective prefixes are an instance of event-quantity, this is exactly what we predict. We note, by way of completing the picture, that it is rather difficult to claim that in and of themselves, Cantonese classifiers or Slavic perfective prefixes have independent Content such that prefixed verbs or noun-classifier combinations are compositional, as based on the Content of the stem and the Content of the classifier or prefix. On the contrary, the very same prefix or classifier could make a very different contribution to Content with different stems.16

In view of the fact that Slavic perfective prefixes “change Content”, as it is sometimes described, or that diminutives and plural marking may similarly “change Content”, we must ask whether they are functional at all, i.e. whether they are, indeed, instances of CL or ASPQ and with the latter being specifically instances of vacuous. Even more damaging is the fact that when the stem can be attested without an article (e.g. in compounds) it has the same Content as the definite expression, showing that the article in and of itself does not contribute to the emergence of Content (cf. three Bronx men arrested; propriété industrielle en France).

16 Thus while the classifier ki in Cantonese is typically associated with ‘long’, it would be rather a stretch to state that the relationship between ‘long’ and ‘telephone’ compositionally gives rise to TELEPHONE WIRE, let alone TELEPHONE INSTRUMENT. The classifier tung, in isolation having the Content THROUGH, likewise cannot be presumed to compositionally combine with TELEPHONE to give rise to TELEPHONE CONVERSATION. Similarly, it is hard to see what Content the prefix od- may contribute systematically, occurring as it does in the context of czytać (in isolation READ) so as to give rise to PRESENT and in the context of pisać, in isolation WRITE, to give rise to od-pisać REPLY. With thanks to A. Simpson and Z. Wu for the Cantonese facts.
semantic formulas in need of resolution and projecting as ExP-segments. The other option would be to claim that they are affixes which combine with the root within the C-core (e.g. on a par with English prefixes or perhaps on a par with compounds). Similarly, we must ask ourselves whether they might not be ambiguous: serving as markers of ExP-segments and semantic formulas when compositional, but as C-core-internal affixes when Content “changing”.

The answer to these questions must be a resounding no. Crucially, both Slavic perfective prefixes and classifiers/diminutives/plural marking do differ from English prefixes (or, for that matter, from the non-head in compounds), insofar as regardless of their ability to constitute a single Content unit with the stem they are attached to, they nonetheless retain, across the board, their rigid designation, their functorial, grammatical function, in all their occurrences. While /briefs/ may be matched with the non-compositional Content MALE UNDERWEAR, it nonetheless continues to correspond to a syntactic expression which is nominal and which must be a CL, triggering count interpretation and plural agreement and doing so although it is not clearly ontologically in reference to a plurality of objects. The same is of course true for all cases of pluralia tantum. While tung tienwoe (‘phone conversation’) in Cantonese may not be compositionally derived from combining tung with tienwoe, it nonetheless continues to behave like a count noun, obligatorily occurring in the presence of cardinals. While etentje ‘dinner’ may not be compositionally derived from eten ‘food’, it remains the case that it is always counted as well. Similarly, for perfective prefixes, the Content of w-czytać (‘upload’) may not be composed from w- plus czytać ‘read’, but the emerging verbal constituent must be telic/perfective and so on. No such effects are attested for e.g. English compounds or prefixed forms, where the non-head is not associated with such Content-independent rigid designation. It thus emerges that excluding CL or ASPQ as ExP-segments in order to accommodate the atomic Content of pluralia tantum or Slavic perfective prefixes would be an error. If, however, the domain of en-searching is as defined by (34iv), then the impact of exactly these markers, but no others, on atomic Content follows immediately.17

17 Two interesting caveats are worth noting relative to the grammatical properties of plural marking in atomic Content contexts. Note, first, that while rare in English, plural marking is routinely attested in languages on the non-head of compounds, and that as such, it does not interfere with the emergence of atomic Content, as the cases in (i) from Hebrew indicate (and see Borer 2013 for the detailed argument that these are non-compositional compounds):

(i) bet xol.im šomer mitcv.ot
   house sick.pl guard commandment.pl
   ’hospital’ ‘observant Jew’

In (i), atomic Content is available beyond the first ExP-phase, or so it would appear if the structure is as in (ii):

(ii) \[ [N_1 \text{bet} \ N_1 [\text{CL } \text{xol.im} \ [N_2 \text{xol/ } ] ] ] \]
    house sick.pl /bet xolim/ → ‘hospital’

The matter is taken up in some detail in Borer (2013) where I note, following primarily Booij (1994, 1996) (and see also Acquaviva 2008), that “plural” marking inside compounds is syntactically and semantically inert, and that the semantic activation of plural marking is contingent on its syntactic merger environment
10.4 Mismatches Revisited

Having converged on a structural definition of a phase, and having refined our notion of the upper bound of Content matching, it now emerges that in actuality, the notion of phase as defined in (29) can be used successfully to constrain both en-searching and phonological realizations. The mismatches in (30) (repeated here as (37) with ExP-item revised), in turn, emerge not from a different notion of what a phase is, but from the three factors in (38):

(37) for spellout for en-searching
   a. ExP-phases (may) allow phase extension are final Content domains
   b. C-functors i. obligatory spellout domain optional Content domain
      ii. phase-extension impossible phase-extension possible

(38) a. Content matching is optional. (Licit) phonological realization is (ultimately) obligatory.\(^{18}\)
   b. ExP-phase is the final domain of Content.
   c. ExP-heads are open values.

The emergence of mismatches in conjunction with the properties in (38b, c) such that they give rise to the effects in (37a) has already been discussed in some detail (see especially the conclusion of section 10.1.3 above). Property (38c), furthermore, was independently motivated at some length in Chapters 1 and 6. Similarly, the optionality of Content matching was independently substantiated. To illustrate the workings of (38a), however, and how it derives the mismatches in (37b), suppose we consider, yet again, naturalize. Crucially, in order for the non-compositional

(and hence “contextual” plural as labeled by Booij 1994, 1996). Specifically, note that “plural” marking, DIV\(^{14}\), is syntactically and semantically active if, and only if, it is an ExP-segment, with “segment” here indicating partiality of structure. When marking a non-head of a compound, however, this is not the case precisely because such plural marking does not mark a segment, but rather it is all there is to an “Extended Projection” altogether. It thus emerges that in (ii), but not in pluralia tantum, plural marking does not correspond to a true ExP-segment, and hence does not define an ExP-phase. Similar considerations apply to cases in Slavic in which “perfective” prefixes are reported within R-nominals, where their perfective function is altogether inert.

A second caveat concerns the claim here as well as in Borer (2005a, b) that e.g. mass interpretation involves the absence of CL, or that atelicity involves the absence ASP\(_Q\). If correct, we note, then in such cases the domain of en-searching should be allowed to range over markers of a higher ExP-segment, predicting them to potentially enter into atomic Content. Although the matter is fundamentally empirical, the prediction may not be correct. Should this turn out to be a robust empirical generalization, it would suggest that there must be more structure to mass nouns or to atelic configurations than is advocated in Borer (2005a, b).

\(^{18}\) The obligatoriness of some licit phonological realization, especially in view of the optionality of Content, is worth noting. Specifically, we note that in a very real sense, Jabberwocky as it stands is part of English, but not so, e.g., the following line:

(i) ‘twas mnobl and the szixy kotakós

Insofar as licit phonological realization and licit syntax (and functors) are essential, but not so Content, this observation supports the claim, put forward in this work, according to which the latter, in particular, is not part of the grammatical computation, with the term here taken to mean, more broadly than usual, not only syntax but also phonology and formal semantics.
Content ever to emerge, no Content could have possibly been assigned to any constituent embedded within naturally. If we take these constituents to be those in (39), in all these cases, en-searching was suspended. Within naturalize, not only [nat] but also [nature] and [natural] are Contentless (where the representations explicitly abstract away from phonological realization, given the focus of the discussion):

\[
\begin{array}{cccc}
\text{[nat]} & \text{[[nat]ure]} & \text{[[[[nat]ure]al]]} & \text{[[[[nat]ure]al]ize]} \\
\emptyset & \emptyset & \emptyset & \text{BECOME-CITIZEN} / \emptyset
\end{array}
\]

In fact, not only is it the case that e.g. [nature] is Contentless; it is precisely its ability to be Contentless that is a key factor that allows non-compositional Content to emerge. If Content were to be assigned to [nature], the non-compositional Content could never emerge.

The exact converse, however, holds for spellout. If we assume that the root \( \pi \sqrt{\text{NAT}} \) conditions the realization of \( C_{N[V]} \) as /\pi ure/, then it is entirely clear that if such selection has failed to take place, and \( C_{N[V]} \) did not spell out as /\pi ure/ within the relevant phase, by the time the representation merges with \( C_{A[N]} \), eventually to be spelled out as /\pi all/, it is simply too late. The properties of the root are no longer accessible, and the only representation that could emerge for \( C_{N[V]} \) would be the default one, /\pi ation/. While nation does happen to be licit, it is also a distinct derivation, with potentially distinct Content. Nor could the spellout of the root, we note, avail itself to be conditioned by the spellout of the functor (e.g. in inductive vs. inducement) past a certain point. Finally, it is not clear what, within such a system, would force the realization of e.g. \( C_{N[V]} \) altogether, thus blocking /\pi nat-al-ize/ as a realization of the relevant structure; clearly the wrong results across the board. That such wrong results are not obtained within the domain of Content is precisely because no Content is ever matched with e.g. /\pi nat/, and as a result, there is never a need to look into the structure, to find /\pi nat/ and to rescue it, so to speak.

It thus emerges that the optionality of Content goes well beyond the anecdotal availability of nonce words, and is rather the crucial key to the possible emergence of non-compositionality. That no such optionality is attested within phonological realization, in turn, makes the phonological system compositional, in the relevant sense, in a way that is now neither expected nor attested within the domain of Content.

### 10.5 A Note on Category Labels

Throughout this Chapter (and see also the discussion in Chapter 1), I have been assuming, in line with the original intuition in Marantz (1996), that Content is matched with syntactic constituents, and not, e.g., with phonological strings which are otherwise syntactically inert. The conclusion is certainly warranted and has been argued for, as such, by the behavior of e.g. /\pi round/, where phonological information alone would be incapable of distinguishing between the nominal, adjectival, and verbal instantiations, and where, if Content is matched on
the basis of phonological string alone, the systematicity of category–Content correlation would be lost. The paradigm in (40), essentially repeated from Chapter 1, illustrates the point:

\[
\begin{align*}
(40) & \quad \text{a. a round of applause} & [c=N^\pi\sqrt{\text{ROUND}}] \\
& \quad \text{b. a round building} & [c=A^\pi\sqrt{\text{ROUND}}] \\
& \quad \text{c. to round the numbers} & [c=V^\pi\sqrt{\text{ROUND}}] \\
& \quad \text{d. to round up (the children)} & [c=V^\pi\sqrt{\text{ROUND}}] \text{ up}
\end{align*}
\]

From a slightly different perspective, the point was also made relative to constituents which merge with C-functors. Thus recall the contrasts in (41) already discussed in Chapter 6, section 2.3:

\[
\begin{align*}
(41) & \quad \text{a. coastal primal facial sortal} \\
& \quad \text{b. coastable primable faceable sortable}
\end{align*}
\]

What was of interest, in relation to the cases in (41), was the observation that the compositional reading of the expressions is based, specifically, on whatever Content would be assigned to the categorically labeled instantiation of the root, i.e. as in (42):

\[
\begin{align*}
(42) & \quad \text{a. } [c=N\text{coast }]\text{al} & [c=N\text{prime }]\text{al} & [c=N\text{sort }]\text{al} \\
& \quad \text{SHORE} & \text{PRIMARY} & \text{KIND} \\
& \quad \text{b. } [c=V\text{coast }]\text{able} & [c=V\text{prim }]\text{able} & [c=V\text{sort }]\text{able} \\
& \quad \text{GLIDE} & \text{PREPARE} & \text{CLASSIFY}
\end{align*}
\]

On the basis of the cases in (40) and (41), then, it appears that not only does en-searching access phonological realizations of bracketed syntactic constituents, but that the constituents under consideration need to be explicitly categorially labeled as well. The existence of bracketed and labeled phonological strings, we note, is hardly surprising in itself, insofar as spellout, to begin with, is sensitive to categorial information, for otherwise it is hard to see why, in conjunction with an identical root, some forms would be provided with past tense marking, others with plural, and yet others with nothing at all, or, following a similar logic, how the stress distinction between /\pi\text{permit}/ and /\pi\text{permit}/ can be correlated with the correct forms, assuming that both phonological realizations are instantiations of \(\text{per}\sqrt{n}\text{MIT}\).

The need for categorial information for spellout notwithstanding, we note nonetheless that whenever atomic Content is matched with a branching structure, i.e. with more than a single morph, the significance of labeling vanishes. Specifically, it is only in the context of mono-morphs, that the phonological representations /\text{coast}/ or /\text{round}/ do not suffice to assign Content, and rather \([c=N^\pi\sqrt{\text{COAST}}]\) and \([c=V^\pi\sqrt{\text{COAST}}]\) or \([c=N^\pi\sqrt{\text{ROUND}}]\) and \([c=V^\pi\sqrt{\text{ROUND}}]\) are needed. The matching of atomic Content to e.g. /\text{activism}/ or to /\text{civilization}/, to compare, is unambiguous and may proceed without any reference to bracket labels. Note, crucially, that the brackets themselves must be retained, for otherwise it is hard to see how en-searching could be at all respectful of constituent structure. However, in all such cases, the relevant en-searchable string which could return atomic Content could be entirely satisfactorily characterizable as in (43):
The presence of labeled categories, redundant for derivatives, is directly problematic for compounds. Specifically, while mono-morphs such as round, or coast, or prime clearly do need categorial information to be matched with the appropriate Content, insofar as nominal Content and verbal Content may vary, there are, to the best of my knowledge, no instances of distinct Content associated with the verbal or nominal instantiations of atomic compounds, with the list in (44) as a representative sample:

(44) fingerprint; copyright; blackmail; bodyguard; keyboard

In all such cases, distinct representation such as \([C=V/\pi blackmail]\) vs. \([C=N/\pi blackmail]\); \([C=V/\pi copyright]\) vs. \([C=N/\pi copyright]\) would actually miss the point—they would predict, rather erroneously, the possibility of distinct atomic Content units for verbal and nominal instantiations, thereby missing the obvious generalization.

Finally, we note that while cases such as coast and round argue for the significance of category labels in en-searching, even mono-morphemic forms in English quite frequently do not require any such categorial labels, insofar as the Content assigned to distinct categorial realizations of phonologically identical forms is identical. And thus:

(45) \([C/V/\pi kiss]\); \([C/V/\pi walk]\); \([C/V/\pi run]\); \([C/V/\pi form]\); \([C/V/\pi start]\); \([C/V/\pi pen]\); etc.

For the cases in (45), as for the cases in (44), there is little reason to assume that en-searching requires labels. Content, rather, can be returned uniformly on the basis of the bracketed phonological form. To be sure, \(l_n\text{pen}/in\) (46b) is V-equivalent, but is N-equivalent in (46a), and the interpretation of the entire expression in (46a) is altogether different from that of (46b). The difference, however, does not reduce to the existence of two distinct Content units, \(PEN_v\) and \(PEN_n\). Rather, it emerges directly from the structure within which it is embedded (and see directly below, in section 10.6, on the integration of these two components):

(46) a. I found the pen.
   b. I am going to pen a letter.

If on the right track, then, the need for a categorial label in (40) and (41) is in conjunction with a relatively narrow empirical domain. More specifically, it may only emerge in the context of stand-alone root (equivalents), and even then not across the board. It does not emerge either for categorized derivatives, or for compounds.

Recall now that I already noted in section 10.2 that for roots, and roots alone, a licit syntactic object may only emerge in conjunction with some instance of Merge. I further noted that whenever the merger is with some categorizing element, the root perforce becomes labeled and categorized. It thus emerges that there simply is no licit syntactic object corresponding to unlabeled \(l_n\text{coast}\). There is only \([C=V/\pi coast]\), e.g. in the context of ABLE_A[V] or ASP-q, or alternatively, \([C=N/\pi coast]\) in the context of C_A[N] or CL. This, however, is not the case for e.g.
\( /_{\text{nature}} / \), insofar as a coherent and licit syntactic object can be defined such that it includes, e.g. \( C_{\text{V}} + C_{\text{N}} \). Of particular interest here, we note, is the case of compounds. Consider, specifically the following structure for compounds (see section 4 of Chapter 6):

(47) a. 
\[
\begin{array}{c}
\pi \sqrt{\text{FINGER}} \\
\pi \sqrt{\text{PRINT}}
\end{array}
\]

(b. unordered set)

b. 
\[
\begin{array}{c}
C_2 \\
\pi \sqrt{\text{FINGER}} \\
\pi \sqrt{\text{PRINT}}
\end{array}
\]

c. 
\[
\begin{array}{c}
C_1 \\
\pi \sqrt{\text{FINGER}}
\end{array}
\]

Specifically, and crucially, whatever categorial label is associated with the compound as a whole, and hence with its head, is not available at the point at which the two roots merge. Nonetheless, and because one of them would move and adjoin to the other, by Uniformity, that root would become a maximal instantiation of some yet-to-be-determined label, while the other would project. Effectively, then, for compounds, but not necessarily anywhere else, an unmarked categorial value, \( C \), may be in place, albeit temporarily, during the derivation. It now emerges, specifically, that the circled domains in (47) are appropriate domains for en-searching (see Chapter 9, section 3.3), and that specifically, both \( /_{\text{fingerprint}} / \) and \( /_{\text{printfinger}} / \) could be, in principle, matched with atomic Content. As it happens, there is no Content on file for \( /_{\text{printfinger}} / \), dooming it to compositionality. For \( /_{\text{fingerprint}} / \), however, Content has now been returned without a category label, allowing us to compose it with either verbal or nominal ExP-segments.

It thus emerges that there is exactly one domain in which categorial labels are inevitable, and that is when a root merges with a functor. That, then, is the one domain in which en-searching is effectively obligated to take note of categorial labels, as they are perforce built into the information which allows en-searching to discern constituents. That in that domain, but in no other, a categorial label does at times impact Content is thus to be expected. To the extent that in no other domain is such a categorial label necessary, everything else being equal, we may assume it to be

19 We note the possibility that the very same operation affects roots which merge with functors, making the conversion of the root into a licit syntactic object contingent on such adjunction, and hence excluding e.g. (4a) as a level at which Content can be matched with the (categorized) root. More specifically, and in relation e.g. to the derivation in (26), this would mean that Content is assigned to \( \pi \sqrt{\text{ACT}} \) in the post-adjunction structure. It would nonetheless be the case that \( \pi \sqrt{\text{ACT}} \) would perforce be an instance of \( C_{\text{V}} \), by virtue of having merged with \( C_{\text{A}}[\text{V}] \), while a root merging with another root would become a licit constituent, but would remain unlabeled. This execution has not been pursued here precisely because its motivation is contingent on the structural properties of compounds, a matter left out of this study for reasons of space. See, however, Borer (forthcoming) for some relevant discussion.
invisible to en-searching. While the correlations here may be in need of formal fine-
tuning, they are nonetheless too robust to be coincidental.

Note, finally, that English is atypical in allowing a rather large number of Free,
categorized forms which are phonologically indistinct from the root, where categorial
marking is phonologically unrealized, and where distinct Content is nonetheless available.
Once a linguistic system is considered where such phonologically unmarked cat-
egorical labels are the rarity, and roots, by and large, may not even be well-formed
independent phonological objects, it may emerge that constituents which are
co-extensive with roots rarely, if ever, are matched with Content, and hence
the need to provide any labels for en-searching could be summarily dispensed
with, and Content read directly from bracketed but unlabeled phonological strings.
In Chapter 11 I turn to a discussion of the Hebrew morphological system, and by
extension, Semitic morphology, where this is precisely the case, and where, as a
consequence, en-searching rarely, if ever, requires reference to a categorial label.

10.6 Bringing it all Together

The system of Content assignment that has been developed in this chapter takes as its
starting point the assumption that the construction of meaning, as accomplished by
natural language, is not a unified phenomenon. More specifically, I proposed that
meaning construction which is mediated by natural language consists of two com-
ponents. The first of these components, corresponding broadly speaking to Frege’s
Bedeutung, takes as its input a reservoir of named, rigidly designating syntactic and
semantic functions and the syntactic structure and semantic interpretation which
they give rise to. By assumption, the reservoir of rigid designators is finite, universal,
and (directly or indirectly) structure projecting. The reservoir of rigid designators is
where we find grammatical formatives such as (the structural/semantic correspond-
ents of) inflectional markers, derivational morphemes, articles, quantifiers, auxiliar-
ies, and so on. Taking a leaf from Lewis Carroll’s Jabberwocky, I also claimed that all
formal, computational construction of meaning is thus handled. Suppose we con-
tinue to assume that the component of the grammar responsible for the construction
of the relevant structures and their interpretation is, broadly speaking, as developed
in the Extended Standard Theory and maintained in all its latter day incarnations.
Specifically, it involves the construction of a syntactic configuration in accordance
with some well-established computational processes and the conversion of the
emerging structure (including covert mapping operations) into semantic formulas
and semantic composition. I have little to say here about the construction of such
meanings beyond some suggestions already made in Borer (2005a, b), and beyond
many impressive results which have been emerging from two decades of the study of
the syntax–semantics interface. Crucially, I also adhere to the prevailing assumption
within all these models that phonological realization (PF) does not impact the
computation of semantic interpretation (labeled henceforth as LF without taking a
specific stand on its construction). Extremely broadly put, then, I maintain some
version of the T-model, and specifically, as we saw, as mediated through the existence
of some smaller domains, call them phases, which constitute a local domain for the application of well-defined grammatical operations.

I argued, however, that there is another facet of meaning which, broadly speaking, corresponds to Frege’s Sinn, or what I termed here Content. While Content is not grammatically constructed, is computationally inert, and excludes rigid designators, it becomes available, in natural language, through an interface with grammatical representations. Specifically, I suggested that under well-defined conditions, grammatically formed representations may be matched with atomic Content, and with atomic Content being, inherently, an extra-linguistic notion emerging from the conceptual system. Grammar, as such, does create configurations which alter semantic composition and affect the applicability of semantic formulas. Crucially, however, grammar as such does not create Content. What it may do, however, is define a domain into which Content may be imported, so to speak, from a fundamentally distinct cognitive domain.

The account developed here, rather non-conservatively, or so it would appear at first sight, claims that not only are semantic meaning and Content distinct components, but that they correspond to grammatical structures that otherwise do not interact directly with each other. Rather, and with the T-model in mind, semantic representations are built of non-spelled out representations and computed from fundamentally abstract properties of functors and structures. Content, on the other hand, is matched on the basis of spellout, phonological realization, and in a component of the grammar that is capable of seeing some syntactic constituent structure, to be sure, but is incapable of seeing beyond the specific spellout properties of items in syntactic contexts. To the extent that “functors” exist in that component, then, they exist as phonological, rather than syntactic or semantic, entities. They are, to borrow the terminology of Distributed Morphology, Vocabulary Items. Within such a picture, what we can refer to as the “totality of linguistic meaning”, should such a notion be useful in any sense, emerges from the conjunction of LF representations (broadly construed) with Content. Insofar as there is, of course, substantial shared syntax between the two representations, it emerges from the fact that the shared syntax was constructed prior to the split-off point, and it is precisely because of the shared syntax that such conjunction is, to begin with, coherent. To the extent that (conceptual) Content is nonetheless interacting with phonological realization, but semantic interpretation with LF, there is, in this system, no unified Conceptual-Intensional Interface (CI Interface) in the sense of Chomsky (2004, 2007), although there certainly are interfaces between grammatical representations and non-grammatical ones, the latter including aspects of meaning.

While the picture may appear radically new, most of its components are in fact already assumed in one way or another in most current generative approaches. Within the T-Model, derivations are specifically seen as triplets of output representations—not only LF and PF, but also lexical representations (for example of listed word properties). Insofar as, say, many students ate the potatoes has semantic properties by virtue of having structure or by virtue of the semantic value of many or plural marking, or the, such semantic properties are typically assumed to be oblivious not only to the properties of PF, but also to the Content of potatoes (as compared, for
example, with the Content of apples). Insofar as that utterance does have phonological properties, in turn, these are quite blind to the specific semantic function of e.g. many or the; and finally potato(es), as it turns out, has Content (POTATO) which is clearly oblivious not only to the fact that it is a direct object, but also to the fact that it is plural, that it is embedded within a definite description and that its initial consonant is [p]. Viewing the simplest of utterances as a conjunction of representations otherwise computed within distinct formal systems is thus inevitable.

We note now that in principle, little need be done beyond proposing that whatever information is conveyed by LF representations, and whatever is Content, give rise to a conjoined set, and as such involve an intersection. It is also worthwhile noting that “signification” does not just emerge from language, and that much of “linguistic meaning”, so called, directly interacts with non-linguistic systems of “signification” and that such interaction, likewise, is probably best described as entering a conjunction with other aspects of meaning. Presumably, that would be the way to model any interaction between linguistic meaning and e.g. facial expression or hand gestures. We note further that the conjoining of such representations and the intersection that results routinely give rise to “coercion-like” effects. To illustrate, a rude hand gesture accompanying a linguistic expression such as I love you is in all likelihood deciphered through some mode of conjunction, and precisely insofar as it is so, requires the suppression or the accommodation of whatever Content is otherwise already associated with e.g. LOVE, and with whatever Content may be associated (compositionally) with the entire utterance I love you. Insofar as it is likely that the meaning of hand gestures, rude or otherwise, may intersect with that of complete linguistic representations, then, and insofar as hand gestures clearly are signifiers and quite possibly even symbolic at that, it is clear that not all systems of sign are linguistic and that viewing signification, broadly construed, as a set of conjoined representations is inevitable.

Focusing on the issue of the interaction between Content and LF representations, we note that once complex words are presumed to be syntactic constituents, rather than listed lexemes, there is little reason, in principle, to differentiate between potato and e.g. globe, when the latter is embedded within globalize. Insofar as the Content of potato comes to be understood at some point as embedded within a structure which may have its own syntax and its own semantics (e.g. the three potatoes), the situation of globe or global inside globalize is no different. By way of illustration, suppose we consider the various representations in (48) and the way in which Content representations and syntax–semantic representations may be combined to give rise to their final signification within the phase-based execution outlined in the previous sections of this chapter:

(48)  a. [too little table] for the money
    b. globalize
    c. globalizable
    d. civilization (under its atomic Content, CULTURE/SOCIETY)
    e. veritable
The bracketed expression in (48a) is a case of coercion which does not involve C-functors, but rather a conflict between the Content matched with the C-core (TABLE) and the semantic interpretation associated with the Extended Projection dominating that C-core, and in particular, the semantic properties of the S-functor (TOO) LITTLE. At the very minimum, then, the relevant pair would have to involve the conjunction of the representations in (49a, b) and thus would be as in (49c) (semantic portion of representations schematic only):20

\[
\text{(49) a. PF/Content: } \left[ \text{ExS1 } /_{\text{too little/ }} [\text{ExS1 TABLE } [c=n]] \right] \\
\text{b. LF: } \left[ \text{I-REF} \right] \left[ \text{TOO} \right] \left[ \text{TABLE } [c=n] \right] \\
\text{c. } \left[ \text{ExS1/ExS2 } /_{\text{too little/ }} \left[ \text{ExS1 TABLE } [c=n] \right] \right] \left[ \text{I-REF} \right] \left[ \text{TOO} \right] \left[ \text{TABLE } [c=n] \right]
\]

Considering first the representation in (49a), note that for Content, final phase is at ExS1, and thus TABLE will emerge before it merges with the ExP-segment #. The specific S-functor (TOO) LITTLE, as it happens with its own phonological index, will spell out at PF on the basis of that index at some later point. The specific semantic formula it names, and in particular, for our purposes, the fact that it is only compatible with mass structures would be absent, however in PF. Even more crucially, Content would not be assigned to e.g. /_{too little/} not only because none happens to be available, but primarily because, by definition, extending en-searching to the #P domain is impossible. The LF representation, in turn, is an abbreviation of relatively straightforward syntactic input, and is interpreted as mass by virtue of the absence of the DIVCL value for ExS1, whatever it may turn out to be (and see fn. 17 for some relevant discussion). Insofar as the intersection between the members of the pair in (49c) gives rise to a combination of the Content TABLE, conceptually rather saliently count, with a grammatically mass semantic representation, coercion emerges. Insofar as Content reflects conceptual knowledge, and insofar as conceptual knowledge is extremely malleable, it is the Content that would be subject to accommodation, rather than whatever interpretation emerges in conjunction with the semantic and syntactic computation (and see Borer 2005a for some discussion of this point).

Consider now globalize under its fully compositional reading. The relevant triplets, by phase, would be as in (50):

\[
\text{(50) globalize (compositional):} \\
\text{a. PF: } ([c]_{[c=n]} [globe] ( )) \rightarrow [c_{[c=n]} [globe] /_{n/ }] \rightarrow [c_{[c=n]} [global] /_{n/ }] \\
\text{b. Content:} ([c]_{[c=n]} [GLOBE] ( )) \\
\text{c. LF: } [A_{[n]} ] \rightarrow [A_{[n]} ] \rightarrow [V_{[A_{[n]}]} ]
\]

20 To the best of my ability to ascertain, there is little advantage to assuming that roots as such are visible in the semantic representation, although, insofar as they are present in the syntax, they might continue to be so. The matter appears to be of little consequence.
Suppose we consider now the merger of ABLE with globalize, still fully compositional as in (50). Insofar as \textsc{able}_{\pi \text{globalize}}^{\lambda v} does have a semantic function, the relevant LF representation would be as in (51b), to be conjoined with the PF representation in (51a):

\[(51) \ a. \text{PF: } (L_C) [C \ /_{\pi \text{globalize}} /_{\pi \text{able}} / ()] \\
\quad b. \text{LF: } [\lambda v \quad \ldots \quad \text{ABLE }]
\]

Turning to non-compositional cases, the representational sets, by phase, for e.g. civilization would be as in (52). In contrast with (50), here Content is matched with the last (relevant) phase, rather than the first one. Note that all C-functors here are devoid of a semantic function, and hence absent in LF, as such:

\[(52) \ a. \text{PF: } (L_C) [c \ /_{\pi \text{civilize}} /_{\pi \text{action}} / ()] \rightarrow [c \ /_{\pi \text{civilize}} /_{\pi \text{action}} / ()] \\
\quad b. \text{Content: } [CULTURE/SOCIETY] \\
\quad c. \text{LF: } [\lambda [\pi v \ldots ] ] \rightarrow [v \ [\pi v \ldots ] ] \rightarrow [\lambda [\pi v \ldots ] ]
\]

Finally, consider veritable. Like civilization, it is non-compositional. However, by assumption ABLE maintains its semantic function and is hence visible in LF, although its spellout does contribute to the emergence of atomic Content. The emerging result, then, would be as in (53):

\[(53) \ a. \text{PF: } (L_C) [c \ /_{\pi \text{verit}} /_{\pi \text{able}} / ()] \\
\quad b. \text{Content: } [\text{VERITABLE}] \\
\quad c. \text{LF: } [\lambda v \ [\pi v \ldots ] ] \rightarrow [\lambda [\pi v \ldots ] ] \rightarrow [\lambda [\pi v \ldots ] ] \\
\quad d. [\text{VERITABLE}] \cap [\lambda [\pi v \ldots ] ] \text{ABLE]}
\]

As outlined, the system makes an important and non-trivial prediction: functors, whether S- or C-, cannot be pre-empted by Content. Rather, even in the context of atomic Content, they are predicted to continue to make a constant rigid contribution to the syntax and to the LF computation. This prediction emerges directly from the separation of Content and LF, and from the claim that while C-functors are present in narrow syntax this is not the case for Content. The only contribution functors can make to Content, we claimed, emerges not from their semantics, but rather from their phonological properties; the latter, by assumption, language-specific and altogether accidental. Content, in turn, is simply prevented from interacting with LF in any direct way.

The prediction, we note, is in turn divided into two classes of cases. One involves the semantic function of C-functors, if they have one. We already noted, in that context, the preservation of function for plural in pluralia tantum and for Slavic perfective prefixes, even when they affect Content. It is further easy to show that the semantic function of e.g. ABLE is retained not only in compositional cases, but even in cases where ABLE merges with a root that otherwise does not have an independent Content, and thus:

\[(54) \ a. \text{affable; arable; capable; potable; defatigable; culpable; evitable; effable . . .} \\
\quad b. \text{terrible; feasible; possible; horrible; fallible; plausible; credible; eligible . . .}
\]
A very similar case can be made for e.g. ER, for cases such as pretender or dictator, where the Originator function of ER, however characterized, is retained although the literal compositionality of the expression is lost (pretender is not one who pretends, nor is a dictator one who dictates).\textsuperscript{21} Finally, while cases such as variable do occur as N, as do e.g. tonic or logic, what is nonetheless striking is the degree to which the diagnostics of C-functors persists in non-compositional contexts. That is, the degree to which \( /_\pi \text{able} / \) remains an “adjective” maker with a certain modal interpretation, or the degree to which \( /_\pi \text{er} / \) remains Originator, and \( /_\pi \text{ic} / \) remains, with few exceptions, an adjectival ending.\textsuperscript{22} If Content is allowed to pre-empt function, or, for that matter, if (stress shifting) C-functors are altogether devoid of function and are roots, as in Lowenstamm (2010) or De Belder (2011), the general case, i.e., the persistence with which in the majority of cases C-functors continue to maintain their categorial specification as well as their semantic function in both compositional and non-compositional contexts, will be sacrificed in the interest of a minority of exceptions.

The system of phase-based spellout, Content matching and the interaction between them that has been proposed in this chapter is, as the (surviving) reader no doubt appreciates, not a simple one, nor, at least at some junctures, particularly intuitive. In Chapter 11 I turn to its workings in an altogether different morphophonological system, that of Hebrew, in particular, and by extension Semitic languages in general. As we shall see, in Hebrew the model sketched here not only yields considerable empirical bonuses, but also emerges as the only possible coherent way to go.

\textsuperscript{21} And see Chapter 12, section 5 for more discussion of ER.

\textsuperscript{22} As already noted in section 5 of Chapter 7, an in-principle explanation is required for the fact that so many adjectival affixes do a double job as both A and N. While in this respect -ic is not nearly as predictably both an N and an A as, say, -ist, -(i)an, or -i, there certainly are a sufficient number of cases in which -ic does do a double job, including but not limited to the cases in (ia) (all cases with an indefinite article to exclude an elliptical N reading. See Borer and Roy 2010 for discussion). It nonetheless remains the fact that -ic is only an adjective in the cases in (ib); that there are no cases in which -ic marks a V (mimic notwithstanding); and that cases where -ic marks a nominal in the absence of an adjectival instantiation are exceedingly rare. All these would be expected to freely occur if atomic Content could pre-empt function:

(i) a. an academic; a heretic; a catholic; a lunatic; an alcoholic; a schizophrenic; a diabetic; an epidemic
b. *an athletic; *a forensic; *an anemic; *a paranoic; *an agnostic; *a chaotic; *a sarcastic; *a manic
Semitic Verbal Derivatives: Prolegomena

11.1 Binyanim—the Builders

11.1.1 Preliminaries

The model developed in this book was motivated, primarily, by an investigation of English derivatives. A full account of Semitic derivatives is clearly outside the scope of this work, nor do the following remarks presume to comment on all potentially relevant domains. Nonetheless, it is worthwhile investigating the potential universality of the theoretical claims thus far made by attempting to apply them to a system with very different realization properties, that is, the verbal system of Semitic languages, and more specifically, that of Modern Hebrew. More concretely, a number of important claims have been made in the previous chapters concerning the interaction of spellout and Content as well as the workings of categorization and local phonological selection, and it is thus worthwhile investigating the degree to which these claims are applicable to a distinct realization system. Among such claims we can count, at the very least, those in (1)–(3) (stress shift is set aside, being largely irrelevant in Hebrew or Semitic in general to the determination of morphological domains). The question under investigation, then, is whether similar organizational principles are at work within the Semitic verbal system in ways that may shed light on the properties of Semitic morphology, on the one hand, and on the degree of universality of the system, on the other.

1 While the templates of Standard Arabic and dialects of spoken Arabic utilize different combinations of affixes, gemination, and vocalic melodies, and while Classical Arabic has ten to Hebrew’s five templates (binyanim, lit. ‘buildings; structures’), formally, the verbal systems are identical. Within the nominal domain, one salient area of difference concerns the existence in Arabic (as well as in Ethiopian languages) of templatic plurals (so-called broken plurals), which are absent in Hebrew (and in North Western Semitic altogether). Insofar as broken plural instantiations are clearly root-selected, they do conform to the locality conditions presented here. The matter, however, is not pursued any further.
Each instance of Merge defines a phase.

**C-Functor spellout:**
- Roots may locally select the realization of C-functors which merge with them.
- Absent root selection, C-functors will have a default realization.

**Content matching:**
- En-searching operates by phase on (labeled) bracketed phonological strings.
- The en-search domain must include a C-core.
- Content is assigned optionally, but once assigned cannot be overridden.
- ExP-phase marks a final Content domain.

**Root spellout:**
- Roots spell out in the phase immediately containing them.
- Roots (may) determine the realization of S-marking (locally).

Some relevant properties of the Semitic morphological system were already touched upon in Chapter 3 as well as in Chapter 8, section 1.2 and Chapter 9, section 2.2. Further elaborating, each verb, in a Semitic language, belongs to a particular morphological template—binyan—which is associated with a specific set of vocalic melodies as well as, at times, with affixation (including gemination, by assumption an infix), which are realized in conjunction with a core set of consonants, or “radicals” ranging from two to four. In Hebrew (Biblical and subsequent) there are, in total, five such templates: binyanim. Of these five, two (III, V) have sub-templates marking the distinction between passive and active voice. For each of these five, as well as for the two passive instantiations, there are, in turn, two stems, a perfective one and an imperfective one, thus giving rise to (at least) 14 phonologically distinct stems. These stems, in turn, serve as the foundation on which a variety of other grammatical distinctions may be encoded. Setting aside binyan I, sometimes referred to as Qal, for reasons that shall become clear directly, the picture is that of extreme morpho-phonological regularity—for any given verb in binyanim II–VII, and including the internal passives of binyanim III and V (notated as IV and VI respectively), the forms of inflected verbs are entirely predictable, with any phonological deviations solely attributable to phonological processes that affect primarily glides and gutturals and which thus impact, in well-defined phonological environments, verbs derived from roots which contain such radicals. The inflected templates for II–VII are in (5) (“R” for root radicals, and with subscript indicating its placement in a tri-radical configuration. The occurrence of two same-index instances of R indicates binyan-driven gemination, always

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2 As argued in some detail especially in Chapters 1 and 6, the distinction between C-functors and S-functors is not phonological, nor does it correspond by necessity to the existence of distinct phonological domains (i.e. it is specifically not the case that C-functors have to be realized before S-marking). Nonetheless, we also saw that at least at times, the realization of a C-functor can impact Content, but only if it precedes the merger of S-functors. The singling out of C-functor realization in (2), then, serves a heuristic purpose, in highlighting this factor as a component of our inter-system comparison.
of middle radical; italicized upper case for binyan-contingent affixation; parenthesized segments mark assimilation occurring, predictably, in some but not all contexts. Benoni, added for completeness, is the participial form, used, in Modern Hebrew, as present tense):3,4

<table>
<thead>
<tr>
<th>Template/Binyan</th>
<th>Example</th>
<th>benoni</th>
</tr>
</thead>
<tbody>
<tr>
<td>II NiR,R,aR₁</td>
<td>nišbar</td>
<td>hišaber</td>
</tr>
<tr>
<td>III R₂iR₂eR₁</td>
<td>bišel</td>
<td>bašel</td>
</tr>
<tr>
<td>IV R₁uR₁aR₁</td>
<td>bušal</td>
<td>bušal</td>
</tr>
<tr>
<td>V HiR₁iR₁</td>
<td>hípšir</td>
<td>(h)ápšir</td>
</tr>
<tr>
<td>VI HuR₁aR₁</td>
<td>húpšar</td>
<td>(h)úpšar</td>
</tr>
<tr>
<td>VII HITR₁aR₁</td>
<td>hitpašer</td>
<td>(h)ítpašer</td>
</tr>
</tbody>
</table>

The table in (6) gives the specific uses of the stems when they realize inflectional markings in Modern Hebrew (note that the passive variants lack their own infinitives and imperatives):5

3 See “Note on Hebrew Transcription”, pp. xxiv–xxvi for the considerations brought to bear on transcribing Hebrew. Quote form is perfective 3.sg.m, but glossed, systematically, without tense/aspect/agreement information (unless in a syntactic context).

Guttural radicals (’, ʔ, r, x, h) do not geminate (in Tiberian Hebrew), resulting in the lengthening of the preceding vowel in III and VII (neither pronounced in Modern Hebrew nor represented here), and in its lowering preceding /r, l/, the latter of which is preserved in Modern Hebrew (and hence pereq ‘take apart’ be’er ‘explain’). In VII, the prefixal /t/ metathesizes with the first root radical when a sibilant (and hence /šš hištāšel/, rather than */šš hištāšel*). In turn, the metathesized prefixal /t/ undergoes voice assimilation and emphatic assimilation if the first radical of the root is voiced or emphatic, and hence */šš hištāšer/ ‘accumulate.intrans’ rather than */šš hitpašer/, and */šš hitzanneb/ ‘trail’ rather than */šš hitzanneb/.

4 Binyanim III and VII appear to have an allomorphic variation specific for roots in which the second and the third radical are identical:

<table>
<thead>
<tr>
<th>(i)</th>
<th>III</th>
<th>VII</th>
</tr>
</thead>
<tbody>
<tr>
<td>perfective</td>
<td>pocecc</td>
<td>hitpocecc</td>
</tr>
<tr>
<td>imperfective</td>
<td>yepocecc</td>
<td>hitypocecc</td>
</tr>
<tr>
<td>(TRANS)</td>
<td>blow up</td>
<td>fly around</td>
</tr>
<tr>
<td></td>
<td>converse</td>
<td>masturbate</td>
</tr>
</tbody>
</table>

In actuality, however, the forms are cases of quadro-radical roots, with the /o/, historically long, standing for the glide /w/, and with the erstwhile third radical doubling. That this is indeed the case is evident from the invariant perfective/imperfective form as well as from the spirantization of the first occurrence of the radical P e.g. in űopep (*/šš hitpašer*), indicating the absence of gemination.

5 Binyan V displays a systematic marking of the imperative on the imperfective stem, giving rise to the difference between e.g. ke-hasbér ‘to explain’ and hasbér! (‘explain’, imperative). The effect can be
Anticipating the discussion in section 11.2 and morpho-phonological regularity notwithstanding, the reader should bear in mind that few roots occur in all binyanim. Furthermore, roots that occur in more than a single binyan may or may not share discernible Content across their different binyan instantiations. From the perspective of the selection system developed here, then, it appears eminently plausible that roots select their binyan realizations.

11.1.2 Climbing up the Extended Projection ladder

Setting aside for the time being the selection properties of roots, a perusal of the tables in (5) and (6) reveals two types of non-root phonological information. The first type is clearly associated with properties of the binyan under consideration which are realized in a virtually identical manner in both the perfective and the imperfective. Thus all instantiations of binyan II, including its perfective-based benoni form, share an n-prefix (assimilated to the first radical in the imperfective). All instantiations of binyan VII share a hit-prefix and a geminated middle radical; all instantiations of binyan III share a geminated middle radical, and so on.

The second type of phonological information associated with the forms in (5) and linked primarily (although not exclusively) to the inter-radical vowels is clearly contingent on properties of some S-functors, i.e. voice, tense, mood, etc. Importantly, and with the exception of the vocalic realization of the passive forms IV and VI, the realization of such S-marking varies in accordance with the specific binyan. While some cross-binyan sub-regularities concerning the realization of the perfective or the imperfective may occur, a substantial residue of the realizational vocalic information remains binyan-specific, and shared realizational properties such as may exist are, at

straightforwardly accommodated within a system that allows the choice of vocalization to be conditioned, within a specific binyan, by S-marking accomplished in distinct merger sites. It also suggests rather straightforwardly that imperatives are associated with an ExP-segment distinct from that of the future or the infinitive.
best, rather tricky to formalize. In turn, however, within each binyan, the realization is entirely fixed. There are, then, four (non-passive) exponents for the perfective (specifically when realizing past tense). These exponents, however, are never in competition, nor is there, sensibly, a default which comes to be associated with elsewhere cases. Rather, the choice of exponent is deterministically governed by the binyan. Nor does it seem sensible to consider it as a “default” of the relevant binyan, precisely because no other options are ever available.

Particularly informative, in this respect, is a comparison of the non-passive forms with the internal passive variants IV and VI. In the latter, we note, not only is the realization identical across both binyan variants, but is also identical for the perfective and the imperfective. In view of such single, uniform realization, suppose we assume, following Arad (2005), that this vocalic realization, specifically $u-a$, is associated with an S-functor, call it P-Voice or $P-Vc$, by assumption responsible for the emergence of the passive vocalic realization (and see Chapter 5, section 4 for a detailed analysis of the passive). In turn, this realization is clearly in a position to pre-empt any other vocalization, otherwise presumably conditioned by the binyan, by some dominating S-Functor. But if so then it follows, mutatis mutandis, that the absence of such regular realization within the non-passive forms follows from a strong, if not necessarily exclusive influence of the binyan on the phonological realization of the specific inflectional marking that merges with it.6

The properties thus described receive a coherent description if we take the binyanim to define a cluster of categorial realization properties, rather akin to the assumption in Aronoff (1994) according to which binyanim are inflection classes specifically including information not only about (some) classical inflection, our S-marking, but also about the realization of categorizing affixes, a clustering of

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6 Arad (2005) considers binyanim (including binyan I, Qal) to be realizations of $v$, and thus, in our terminology, $C_{\forall[X]}$. Nonetheless, in her system the actual verbal status of the root-binyan combination requires some verbal ExP-segments:

To become a verb, a root has to merge first with a verbal head, and then with a number of other heads associated with verbs—voice, tense, aspect, and mood . . . That is, a root is verbalized—in that it can no longer be a noun—once it is associated with a $v$ head, but it only becomes an actual verb once it has merged with the syntactic features that constitute verbs—voice, aspect, tense, etc.

(p. 40, italics in original, underlining mine, HB)

For Hebrew, Arad proposes, the crucial ExP-segment is Voice (both active and passive), the realization of which is in turn conditioned by the choice of binyan, thereby endorsing Aronoff’s (1994) “inflectional class” approach.

The Arad system nonetheless differs from that proposed here in several rather important respects. First, Voice, for Arad, is not privative, with the emerging result that in her system active voice has ten distinct realizations, contingent on binyan and on tense/aspect, as compared with a unique realization for passive across both binyan and tense/aspect. More importantly, it is not clear how to evaluate the distinction between “verbalization” and being an “actual verb” (as in the quote above), a matter that is of significance when we consider cases in which the binyan, by assumption $v$, is embedded under a nominal or an adjectival suffix. Thirdly, and most crucially from the perspective presented here, the classification of Qal as a binyan results in obscuring some of the most fundamental properties of the system, a matter I return to in section 11.2. For some problems for the interaction between structure and Content for Arad’s analysis of Hebrew, see section 11.4.
properties which I will refer to as “derivational realization class”. Relevant to the case at hand, suppose the binyan, in and of itself, comes with some realization information, but it does not include a fixed internal vocalic realization. Rather, the internal vocalic melody is the realization, the spellout, of voice, tense, and possibly mood. The binyan does get to choose the vocalic exponents associated with such functions, but, as is expected, only locally, i.e. within the phase that directly contains it.

Even more explicitly, suppose P-Vc, Passive Voice, is privative, a suggestion already made in Chapter 5, section 4, and non-passive emerges in its absence. In turn, where both P-Vc and PST/FUT are present, it is P-Vc, the lower ExP-segment, which merges directly with the binyan. The emerging schematic structures are thus as in (7a–c).8

(7) a.

```
T
```

```
PST/FUT< \begin{array}{l}
\emptyset \quad -a \\
i \quad -e \\
i-i \\
a-a \\
\end{array};
\begin{array}{l}
a-a \\
a-e \\
a-i \\
a-e \\
\end{array}>
```

```
π\sqrt{RRR}
```

```
B_{II,III,V,VII}
```

```
π\sqrt{RRR}
```

```
T
```

```
PST/FUT< \begin{array}{c}
P-Vc
\end{array}>
```

```
P-Vc
```

```
P-Vc
```

b.

```
B=binary; II-VII=derivational realization class
```

7 Grammatical aspect does occur in Hebrew, but requires a participle and an auxiliary, and it is the latter which is then tense marked.

8 In Chapter 5 I also argue that a number of other event structure-related nodes may intervene between a (V-equivalent) root or a derived verb, and the P-Vc projection. The intermediate nodes, however, would only be of relevance if they were to block the re-merger of the C-core up the ExP-ladder, and as I already noted in Chapter 5 as well as in Chapter 9, this need not be the case. On whether such nodes may merge between the root and the binyan projection, see section 11.5.
Suppose we consider first (7a). B re-merges and projects as T, where it becomes marked as PST or FUT by the relevant (abstract) S-functor.\(^9\) Now insofar as the vocalic realizations of PST and FUT are binyan contingent, once the binyan is appropriately marked, as in (7a), the emergence of the correct vocalization is local and hence possible.

Consider now (7b). Insofar as the realization of the \(P-Vc\) is constant across its occurrences, we would be justified in assuming that it is not selected by the binyan, but is, rather, fixed and independent of binyan choice. In (7b) B (together with the root embedded within it) moves to \(P-Vc\), where it becomes marked as \(P-Vc\). The realization, in turn, is not subject to any binyan intervention, and the uniform spellout as \(u-a\) emerges. Recall now that at least in principle, spellout at any given phase is optional (see Chapter 10, section 1.3). At least in principle, then, \(B^{P-Vc}\) may spellout at \(P-Vc\). If that is the case, we note, then no further vocalic changes are possible, as the available vocalic slots have been realized. Alternatively, \(B^{P-Vc}\) may re-merge and project as T, with the input to spellout being, rather, \(B^{P-Vc,FUT}\) or \(B^{P-Vc,PST}\). In the latter case, root-internal spellout information would need to be structured so as to favor uniform marking for \(P-Vc\) over tense information. Either way, the direct result is that for the passive forms, no further inter-radical realization is possible, and thus no further tense information can be inter-vocally realized.

It is important to note that the re-merger of \(B^{II,III,V,VII}_{P-Vc}\) as T is not blocked, and that the structure in (7c) is licit. Either because the inter-vocalic slots have already been realized, or because \(P-Vc\) marking is prioritized, however, any additional marking of tense would have to be otherwise accomplished, if at all, and indeed what we find when we consider the forms in the table in (6) is that in the \(P-Vc\) realizations, the distinction between the perfective/past and the imperfective/subjunctive/future is accomplished through the distribution of person agreement markers alone, occurring post-stem for perfectives, but pre-stem for imperfectives.

\(^9\) For ease of exposition, I assume without further discussion that \(PST^T/FUT^T\) as well as \(P-Vc\) are abstract. Recall that verb movement is required when the S-functor is abstract (although it may not be otherwise blocked).
11.1.3 *Binyanim and the merger of C-functors*

The presence of binyan-specific phonological realizations is even more clear within the domain of de-verbal derivatives where it is the binyan and the binyan alone which determines their form. Such is clearly the case for derived nominals as well as for de-verbal adjectives, the latter corresponding to both active and passive participle. Such is, furthermore, the case for agentive nominals, based on active participles. As in the case of S-functors and their exponents, and setting aside, yet again, predictable phonological effects contingent on the choice of root radicals, the morpho-phonology of derivatives is virtually without exceptions:

<table>
<thead>
<tr>
<th></th>
<th>active-participle based:</th>
<th>passive-participle based:</th>
<th>derived nominal</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>II</td>
<td>adjective, agentive nominal</td>
<td>nima'cal present</td>
<td>Hima'cal present</td>
<td></td>
</tr>
<tr>
<td>V</td>
<td>MEL, R,iR,  maslil complements</td>
<td>MEL, R,aR,  maslim completed</td>
<td>HAM, R,aR,  haslalama completion</td>
<td></td>
</tr>
</tbody>
</table>

*An intransitive binyan. One participle only.*

Here, we note, it is entirely clear that to the extent that there are some $C_{N[v]}$ and $C_{A[v]}$ functors such that they merge with different binyanim, their N/A projecting function as well as their V selecting function are constant across different binyan realizations. Nor does it appear plausible to assume that each of the phonological instantiations of such $C_{N[v]}$ or $C_{A[v]}$ in (8) represents a different semantic function. It is equally clear, in turn, that to the extent that there are such $C_{N[v]}/C_{A[v]}$ functors with identical syntax and identical semantics regardless of binyan realization, the phonological realization of such $C_{N[v]}$ is determined solely by the binyan with which it merges. It might be worthwhile noting that even the gender of such derived nominals is contingent on the binyan, with the derived nominal for III being masculine, but the derived nominals for II, V, and VII being feminine.

Throughout this volume (see Chapter 6, section 2.5, Chapter 7, section 3.5, as well as Chapter 10), I have argued rather strongly that in English, the idiosyncratic selection of spellout for C-functors is (almost exclusively) a prerogative of the root, and specifically, that the item-specific choice of a de-verbal nominalizer, in English,
can only be accomplished in the local environment of the root, by assumption also
categorized by that selection. Contra Fabb (1988), Plag (1999), and Raffelsiefen (1992),
as well as Embick (2010), I have argued that the mechanism by which -ation spells out
C_{N[v]} following derived verbs (with -ate, -ify, and -ize) is fundamentally different. It
does not involve an item-specific selection of $/\pi$ation/, or more accurately, $/\pi+$ation/
by these suffixes or by any roots, but rather represents the fact that $/\pi+$ation/ is the
default spellout of $C_{N[v]}$, and is hence perforce its realization in all environments
which do not allow root selection (and which are otherwise compatible with the
phonological properties of $/\pi+$ation/, including, but not limited to, the fact that it
comes with a + boundary: see Chapter 9, section 2). The same rationale, recall,
applied to English PST realization and the realization of plural, or div, both reverting
to default in the absence of root selection.

We note now that in contrast to the Semitic picture, English does not have the
equivalents of “derivational realization classes”, as we take the binyanim to be, insofar
as item-specific phonological selection does not give rise to clusters of any sort, nor
do any fail-proof patterns emerge. The availability of a particular (irregular) past
tense form does not correlate with a particular realization of $C_{N[x]}$, nor does the
realization of e.g. $C_{N[x]}$ cluster with the realization of $C_{N[x]}$ for the same root. And
finally, as observed already, for a single given root, more than one instantiation
may be available for the same C-functor.10

Not so our binyanim. Indeed, exactly like roots, we assume them to come with a
phonological index, and insofar as they do have such a phonological index, they may
exercise selection over their own realization in S-marked contexts and over the
realization of functors that merge with them. Importantly, however, there are exactly
four such binyanim, each with a unique and rigid set of instantiations covering,
systematically and regularly, both S-marking and functorial realizations, i.e. both
“inflectional” and “derivational” realizations. Nor is there any optionality, for that
matter. While transmittal, transmittance, and transmission may co-occur with iden-
tical compositional Content, there are no cases in which a single binyan, or for that
matter, any verb instantiated with it, can exhibit more than a single realization

---

10 To illustrate the contrast, consider the possibility that English does have (residual) derivational
realization classes, and that just as a binyan selects a range of morpho-phonological instantiations, so can a
particular root select a cluster of morpho-phonological realizations. One potential candidate for such a
cluster would be the triplet ation, ate, and (ative) which does, indeed, occur often with the same root (e.g.
numerate; numerative; numeration). A perusal of the facts reveals directly, however, that the term
“residual” is rather key, insofar as ation can occur with ize and ify and roots which occur with one or
two of the triplet members but not with three are quite common (formation; formative; *formate). Nor can
one exclude the possibility that these forms are at least at times derived from each other (to wit, activate,
activation), or that -ate forms are at least sometimes a back formation from -ation forms, an analysis
explicitly advanced in Plag (1999). Similar considerations apply to sub regularities such as istism or ant-
ence–ence (and see fn. 14 of Chapter 9 for some discussion). What is missing, across the board, is the
fail-safe manner in which the presence of a particular binyan gives rise to an entirely predictable array of
forms that are otherwise independent of each other (i.e. the realization of tense is not contingent on the
realization of $C_{N[v]}$) across the entire spectrum, and ranging over both “inflectional” and “derivational”
forms.
for a C_{N[V]}. What emerges is that a verb in binyan III corresponds strictly to the derived nominal of its binyan, of the form RIR_{R,v}R. Only rarely could other nominals do the job, and only equally rarely is a de-verbal nominal altogether missing.11 With equally few exceptions, there is one possible nominalizer for each Hebrew verb in binyan II, exactly one possible nominalizer for verbs in binyan V, and so on. The regularity, we note, is independent of the root and independent of the Content of the emerging verb, and hence cannot be an idiosyncratic property listed with a lexeme of some sort. In fact, the very same root, and with close enough Content, may occur in different binyanim and with C_{N[V]} differently realized. An even more extreme and by no means rare case is in (9c), where two distinct binyanim

11 Thus */š QR, in III (only): *šiqqer ‘lie’, is missing both derived nominal (*šiqqur) and an adjectival passive (*mešiqqar). To the best of my ability to ascertain, there is simply no way to form the derived AS-nominal with the broad meaning of ‘the constant lying to the court for several years’ as based on that particular root. While šegar ‘lie’—formed from the same root—is attested, and while one can certainly tell the court lies, the AS-nominal in (ia), as based on šegar, is ill formed. The plural variant in (ib) is improved (on a par with its English translation, note), but still does not allow for the aspectual adverbial:

(i) a. *ha-šegar ha.xlsx le-bet ha.mišpat be-mešex šanim
   the.lie the.frequent to-the-house law during years
   (‘)the frequent lie to the court for years’
   b. ha-šgarim ha.txupim le-bet ha.mišpat (*be-mešex šanim)/kedey li.zkot b-a-picciyitim
   the lies the.frequent to-the.house law (during years/in order to win in the compensation)
   ‘the frequent lies to the court (??for years/in order to win the compensation)’

One does find, although rather infrequently, cases in which nouns derived from the same root but not through the verbal binyan system could nonetheless have Content that is close enough to that of a (compositional) de-verbal R-nominal to allow what appears, at first sight, to be multiple nominalization possibilities. Crucially, such nouns do not embed V or V-equivalent constituents, and thus can never be AS-nominals. Most commonly, they are attested when the de-verbal R-nominal associated with the binyan has acquired a particularly salient non-compositional Content to such a degree that it is no longer comfortable in a compositional context. One such case is in (ii)–(iii). Another involves the noun tašlum ‘payment’, non-verbal in source and derived from the root */šLM, which has replaced the expected, but nonetheless infrequently attested šillum. The reason is clear enough—the latter (as a plurale tantum, šillumim) has acquired an atomic Content specifically associated with West German reparation for Nazi war crimes. Equally predictably, to the extent that it is used as a compositional de-verbal nominal, it is in rather strong AS-nominal contexts, where the form tašlum, having no verbal source, is illicit (cf. iv):

(ii) biqquš ([c. */BAKN], III) biqquš baqasha
   ‘request (intrans)’ ‘requesting’, ‘searching’ ‘request’
   ‘search’ ‘demand’ (as in ‘supply and demand’)

(iii) a. biqquš ha-zahav be-cpon Amerika be-mešex ha.me’a ha.tża-esre
   search the.gold in north America during the.19. c.
   b. *baqashaš ha-zahav be-cpon Amerika be-mešex ha.me’a ha.tża-esre
   search the.gold in north America during the.19. c.

(iv) a. forum studentim šel universtat Ben-Gurion: šillum miqdamā šel 1500 la-meqonot (G)
   forum students of university Ben-Gurion: payment advance of 1500 to the residences
   ‘student forum, Ben Gurion University: the advance paying of 1500 to residence halls’
   b. šela le-gabeš šillum agrat rišayon ha.rekeb ba.internet (G)
   question concerning paying fee license the.vehicle in the.internet
   ‘a question concerning the paying of the vehicle license fee by the internet’
with an identical root actually return an identical Content and where nonetheless each retains a distinct derived nominal:\(^{12}\)

(9) a. \([c^{x š b}]\): II

\[n e x š a b \rightarrow h e x a š b u t\]

be.considered → being considered

\[V\]

\[h e x š i b \rightarrow h a x š a b a\]

esteem → esteeming

III

\[x i š š e b \rightarrow x i š š u b\]

calculate → calculation

VII

\[h i t x a š š e b \rightarrow h i t x a š š u b\]

be.considerate → being considerate

b. \([c^{y š b}]\): III

\[y i š š e b \rightarrow y i š š u b\]

settle-TR. → settling

\[V\]

\[h o š i b \rightarrow h o š a b a\]

set(V) → seating

VII

\[h i t y a š š e b \rightarrow h i t y a š š u b\]

settle-INCH. → settling

sit down → sitting down

c. \([c^{r ź b}]\): II

\[n i r ź a b \rightarrow h e r a ź u t\]

become.wet → becoming.wet

\[V I I\]

\[h i t r a ź ź e b \rightarrow h i t r a ź ź u t\]

become.wet → becoming.wet

In view of this, the conclusion seems inevitable—not only are binyanim II–VII pieces of structure, they are pieces of structure such that they in actuality inhibit root selection, thereby giving rise to the observed regularity. Suppose, then, as is equally inevitable, that binyanim II–VII are C-functors which merge with the root. The C under consideration clearly projects as V, and is hence \(C_{v[x]}\). Furthermore, we can assume that \(C_{v[x]}\), a C-functor, nonetheless comes with a set of phonological indices (e.g. like -able or -ship), taking the notation \{II,III,V,VII\} to be specifically in reference to such a phonological index and the derivational realization class which it defines. Thus \(C_{v[x]}\)–III is in reference to a phonological packet of information which is associated with a particular realization of \(C_{v[x]}\), and which may determine not only its own array of affixes and infixes, but also (parts of) its realization in the context of S-marking and the realization of C-functors that merge with it. The first step of the derivation now involves the merger of some instance of \(C_{v[x]}\) with the root (rendering it categorically X-equivalent and leaving open, for the time being, the precise category of X). Subsequent applications of Merge may add both C-functors and ExP-segments, and to the extent that they are in a local relationship with \(C_{v[x]}\), their realization will be contingent on the specific

\(^{12}\) As the forms in (9c) are exact synonyms, the possibility that e.g. the verb in II gives rise to the derived nominal in VII or vice versa cannot in fact be excluded. We note, however, the continuing existence of two entirely synonymous forms in both the verbal and the nominal domain as strongly supporting the direct derivational relationship.
phonological index associated with the $C_{v[x]}$ under consideration. A preliminary sketch is in (10):\footnote{While it is generally agreed that the phonological output of derived forms is determined through an interaction of the binyan and the specific functor merging with it, be it ExP-segment of another C-functor, the precise division of phonological information, in (10), between $C_{v[x]}$ and the head of the dominating projection, is a complex matter which I set aside. For some discussion on the issues involved within the domain of S-marking, see fn. 19 below. Concerning the division of labor between the binyan, $C_{v[x]}$, and, say, a dominating $C_{N[v]}$, I will assume, as appears at least prima facie plausible, that binyan-specific consonantal information, including that contained in affixes, represents realizations that are specifically linked to the choice of $C_{v[x]}$, and are, as a result, constant across any single binyan and its derivatives. In turn, I will assume that the vocalic information within e.g. derived nominals is a facet of the realization of $C_{N[v]}$, and not a facet of the realization of $C_{v[x]}$ (although, of course, determined by it). We note that an alternative exists, whereby the affixal realizations of $C_{N[v]}$ are independent of those of $C_{v[x]}$ but must agree with them when the relevant $C_{N[v]}$ merges with $C_{v[x]}$. According to this latter execution, we have four verbal instantiations (II,III,V,VII) as well as four independent nominal instantiations (likewise II,III,V,VII), and the selection exercised by e.g. $C_{v[x]}$-III is such that it requires it to select $C_{N[v]}$-III and no other. While this particular execution appears rather redundant, it may account more comfortably for the existence of $C_{N[v]}$-III instantiations (and similarly for other binyanim) in cases where there are no attested verbs in the relevant binyan (the latter, we note, never as AS-nominals).}

(10) a.  
\[
\begin{align*}
\text{ExS} & \quad \text{vocalic melody} \\
C_{v[x]} & \quad [_{c_{\pi}}^{\sqrt{RRR}}] \\
C_{v[x]}[\text{II,III,V,VII}] & \quad [_{c_{\pi}}^{\sqrt{RRR}}]
\end{align*}
\]

b.  
\[
\begin{align*}
C_{v[x]} & \quad [\pi_{\sqrt{RRR}}] \\
C_{v[x]}[\text{II,III,V,VII}] & \quad [\pi_{\sqrt{RRR}}]
\end{align*}
\]

We note as a matter of a natural extension of the system developed in the previous chapters that for e.g. derived nominals, (10b) stands as an abbreviation for the structures in (11), with (11b) an AS-nominal involving the re-merger and final adjunction of the $C_{v[x]}$ constituent to $C_{N[v]}$:  

(11) a.  
\[
\begin{align*}
C_{N[v]} & \quad [\pi_{\sqrt{RRR}}] \\
C_{v[x]}[\text{II,III,V,VII}] & \quad [\pi_{\sqrt{RRR}}]
\end{align*}
\]

b.  
\[
\begin{align*}
C_{N[v]} & \quad [\pi_{\sqrt{RRR}}] \\
E & \quad [\pi_{\sqrt{RRR}}] \\
\text{ExS} & \quad [\pi_{\sqrt{RRR}}] \\
C_{v[x]}[\text{II,III,V,VII}] & \quad [\pi_{\sqrt{RRR}}]
\end{align*}
\]
I return in section 11.2 below to the specific properties of the root in (10). Consider however in greater detail the properties of \( C_{V[X]} \). At the level of structure given in (10), it is clear that no structural differences are assumed here between the different realizations of \( C_{V[X]} \). Differently put, there is little reason to assume that e.g. \( C_{V[X]}^{-III} \) has less or more structure than e.g. \( C_{V[X]}^{-V} \) or \( C_{V[X]}^{-VII} \). That this is indeed so stems not only from the synonmys in (9c) but also from the fact that it is very hard to see what structural complexity could be distinguishing between III-\( yi\text{-}sh\text{-}eb \) ‘settle’ and V-\( ho\text{-}sh\text{-}ib \) ‘seat\( v \)’ in (9b). Both are transitive, both are agentive, and both are arguably causative. While their Content is certainly different, that distinct Content cannot be reduced to the Content of the root \( \sqrt{y\text{-}sh\text{b}} \) plus the distinct realizations of \( C_{V[X]} \).

An attempt to reduce the distinct Content to some semantic function which distinguishes between \( C_{V[X]}^{-III} \) and \( C_{V[X]}^{-V} \) doesn’t appear particularly promising either, as at least in the cases under consideration here, pinning down the putative semantic contribution is more likely than not a circular affair. What, then, is the difference, if any, between \( C_{V[X]}^{-III} \) and \( C_{V[X]}^{-V} \)?

The issue, we note, is quite independent of whether the structure of binyan instantiations could be more complex than (10). Thus if ExP-segments may intervene between e.g. form or verbalize and ation when the structure under consideration is that of AS-nominals, then there is certainly no a priori way nor reason to exclude the (schematic) structure in (12a). More structure could also possibly emerge from the merger of multiple instances of \( C_{V[X]} \) as in (12b), with the spellout of any particular binyan, say VII, potentially indicating the existence of an embedded constituent, which would have spelt out as e.g. III in isolation (and see section 11.5 for some discussion of the specific relationship between III and VII):

![Diagram](https://example.com/diagram.png)

14 I assume that C-functors may have a semantic function in addition to a syntactic one. If this is correct, however, we would expect the semantic function of such C-functors to delimit their distribution at least in some ways. If, then, III and V are semantically distinct, that may bear on the plausibility, or lack thereof, of embedding both of them within the same syntactic structure or subjecting them to identical semantic computations. This point notwithstanding, little has been said thus far in this study about the semantic function of C-functors (but see Chapter 12 for some discussion of the semantics of ER\(_N\) and ING\(_V[X]\)); nor were argument-structure changing morphemes discussed (but see some comments in sections 2 and 3 of Chapter 8). Once binyanim are considered, the most robust structural generalization concerning their distribution concerns the fact that binyanim II and VII are always intransitive. There are also good morphological reasons to believe that in a large number of its instantiations, VII is derived from III, and thus may correspond to a more complex structure than (10). Other generalizations concerning the semantics or the syntax of binyanim are considerably less fail-proof, and frequently can only be confirmed when the same root occurs in more than one binyan and where their Content-relatedness can be characterized in terms of a superset-subset relationship. In such cases it is thus at least prima facie plausible that one of the instantiations is derived from the other and then subject to fully compositional interpretation, thereby suggesting that at least at times, the structure in (10) does not suffice. I return to this matter in section 11.5.
The existence, or lack thereof, of the derivations in (12) is, in turn, an empirical matter, and of great significance at that. The direct merger of ExP-segments with roots in Hebrew, as in (12a), is a matter I turn to directly in section 11.2. As to whether instances of \( C_{v[x]} \) can be embedded under other instances of \( C_{v[x]} \) as in (12b), this is a matter I address at some length in section 11.5. The question under consideration relative to the structure in (10), however, is a different one and concerns the extent to which we must assume that different phonological realizations of \( C_{v[x]} \) correspond to distinct structures and to different structural complexity for each such instantiation. Differently put, do we wish to exclude the possibility that the structure in (10) is associated with both \( yiʃšeb \) and \( hoʃib \) (‘settle’ and ‘seat’ respectively), as well as with both \( nirʃab \) and \( hitraʃeb \) (both ‘become.wet’); and if we wish to exclude this possibility, can any non-circular evidence actually be brought to bear on showing that there are, indeed, structural differences between the relevant instantiations?

The simplest answer to the question thus now posed is “No”. According to this simplest of answers, the structure in (10) can be associated with all four binyan realizations, and the difference between e.g. \( C_{v[x]} \)-III and \( C_{v[x]} \)-V is neither bigger nor smaller than the difference between -ment and -ence, or -ous and -al. They are but different phonological instantiations of the same functor, specifically \( C_{v[x]} \), or, differently put, they are distinct insofar as they have distinct phonological indices. If so, we are dealing here with a suppletive set, with distinct and independent phonological realizations for an identical rigid designator.

If on the right track, it is worthwhile to make the workings of the phonological derivation as explicit as possible. Recall now that while sketching out the derivation in (7), I proposed that the vocalic melody associated with each binyan is contingent both on the properties of the binyan itself and on the specific S-marking it is associated with (and, in the case of \( P-Vc \), recall, on the S-marking alone). As I noted, however, some of the phonological properties of the binyan are independent of the vocalic melody and S-marking, as they are, indeed, independent of the phonological properties of the root. Specifically, the affixation and gemination patterns associated with each binyan are preserved not only within ExP-segments, but also in the derivatives in (8). It thus emerges that the phonological indices of the \( C_{v[x]} \) instances in (10) are sufficiently unique to identify each binyan unambiguously before its merger with any ExP-segment or any additional C-functor. Nonetheless, and although phonologically sufficiently distinct at that point, it is still “unpronounceable”, insofar as it is still devoid of vocalic information, the latter to be provided in conjunction either with some S-marking, or in the context of a merging C-functor. To stress the point, then, \( C_{v[x]} \) at that point of the derivation has a unique phonological address, although it is phonologically unviable as an independent form, being still devoid of any inter-radical vocalic information. It is not, differently put, a P-Rad. The division of phonological labor between the different components of the derivation in (10) are thus as in (13). We note, before proceeding, that such a division of labor appears entirely inevitable here, if any unified phonological characterization of distinct binyanim is to be attempted. There must be a way, if the binyanim are at all psychologically and linguistically real, to define them in such a way as makes them phonologically unique, but nonetheless not well-formed phonological units, for it is
exactly that level of representation and that level alone that allows us to give a common source, common phonological denominator, to their distinct end-point, fully specified realizations:

\[
\begin{array}{c}
\text{vocalic melody} \\
C_{x[v]} \\
\text{affixation}
\end{array}
\]

But now, and rather non-trivially, it emerges that the picture in (13), inevitable in Semitic languages, is the very one we have already motivated for English, where it appeared at least prima facie counter-intuitive. Specifically, I argued in section 1 of Chapter 10 that the spellout of C-functors must be allowed to proceed before the (final) spellout of the root. The need for an earlier spellout of C-functors emerged from the sensitivity of en-searching to the spellout properties of C-functors. The need for the late (final) spellout of the root, in turn, emerged from the fact that the spellout of the (unaffixed) root is frequently enough contingent, in English, on S-marking, specifically by PST or by plural marking, i.e. DIV.

Unlike the case of English, however, the need for the late insertion of vocalic melody in the Hebrew picture does not emerge from the idiosyncratic selection properties of roots, precisely because the configurations under consideration are already complex, and the root is, itself, already embedded within a binyan. Rather, the need for the late insertion of the vocalic melody emerges from the entirely regular but nonetheless equally locally selected properties which the binyan imposes on the realization of S-marking. Nor is the need for an earlier spellout of C-functors, or more accurately, the early association of C-functors with a unique phonological index motivated by the need to exclude S-marking from the domain of Content (although as we shall see in section 11.3, it gives us directly the correct Content results). Rather, early realization for C-functors is required because in the absence of a phonological index for the binyan, the subsequent proper selection of C-functors or vocalic realization cannot proceed. What, then, in English, appeared rather counter-intuitive and motivated by phonologically idiosyncratic properties of roots, is, once Semitic is considered, a direct and fully formally coherent result without the need to appeal to any idiosyncrasy.

11.2 Qal: neither a Binyan nor a Builder

11.2.1 Root vs. binyan
Given the system outlined so far we find that there are some similarities between the behavior of English roots and Semitic binyanim, and specifically, both exercise local phonological selection of the type we expect from phonological indices. Insofar as
phonological indices are bundles of phonological properties guiding realization in some well-defined local domain, the similarities are not surprising. Nor is it surprising to find that such phonological properties span selection within the domain of both C-functors and S-marking realizations.

The differences, nevertheless, still outnumber the similarities, insofar as binyanim are few and fixed and clearly represent closed class items. They show a rigid clustering of realization properties across domains and across all their instantiations and hence cannot be assumed to be properties of a lexeme of some sort. Furthermore, and unlike English roots, each of their realizations is unique—one derived nominal per binyan, one agentive nominal/adjective active/participle per binyan, one adjectival passive/passive participle, and so on. Finally, and unlike roots, they clearly do project a category which is fixed across all their instantiations, and hence must be considered C-functors with a rigid designation.

Given the picture of the binyan-root interaction, one must ask a different question. Are Semitic roots, such as they emerge from this picture, ever like English roots? Specifically, consider again the diagram in (10), this time from the perspective of the root. Recall, and as illustrated in (9), that the same root may merge with more than one binyan. However, few if any roots merge with all binyanim, and which binyanim they do merge with cannot be predicted from the emerging Content. Thus the root $\pi\sqrt{\text{LMD}}$ merges with III to give rise to *limmed* ‘teach’, but the root $\pi\sqrt{\text{DRK}}$ merges with V to give rise to *hidrik* ‘instruct’, certainly close enough, Content-wise, but with a distinct root and a distinct binyan. In turn, $\pi\sqrt{\text{LMD}}$ cannot merge with V, nor can $\pi\sqrt{\text{DRK}}$ merge with III. The root $\pi\sqrt{\text{CLM}}$ merges with III to give rise to *cillem* ‘photograph’ but also ‘copy (=xerox)’, while the root $\pi\sqrt{\text{?TQ}}$ merges with V to give rise to *he\text{\tiny\texttt{ETIQ}}* ‘copy’. Yet again, the relationship is unique, insofar as $\pi\sqrt{\text{CLM}}$ cannot merge with V and $\pi\sqrt{\text{?TQ}}$ cannot merge with III. $\pi\sqrt{\text{SBR}}$ merges with II to give rise to intransitive ‘break’ (nišbar), but can never merge with VII, while $\pi\sqrt{\text{PRQ}}$ may never merge with II but does merge with VII to give rise to intransitive ‘fall apart’ (hitpareq), and so on. It thus appears quite clear that the Semitic root does exercise selection, insofar as it clearly chooses the specific phonological instantiation of the C$_v$[$x$] functor (or functors) that merges with it, the binyan. In that sense, then, it is every bit like the English root, which, as we saw, may choose the specific phonological realization of the C-functors that merge with it, and allows, frequently, more than one such realization. However, it is also entirely clear that the realization of all further mergers is determined not by the root but by the binyan. Specifically, and restricting our attention to roots in V-equivalent contexts, the English root when in a V-equivalent context could exercise phonological selection at least in the domains in (14). Not so the Semitic root embedded within (10). Here, the root clearly does exercise selection on the realization of the binyan immediately containing it, but all further selection is exclusively by the binyan. In the table below, the characterization of Semitic roots is specifically as applicable to those which are embedded within structures such as those in (10). The $\blacksquare$ diacritic is in reference to the ability to select more than a single instantiation for a functor:
The picture that emerges is coherent enough, insofar as the properties of root selection are consistent across all occurrences, as are the properties of the binyanim. It does however raise the possibility that in Semitic languages all verbs are bi-morphemic, and as a result, the root may only exercise selection on the immediate functor that merges with it, but not beyond that. Mutatis mutandis, it also argues rather strongly that the English root in V-equivalent contexts is not bi-morphemic, a point argued at some length in Chapter 7, but is rather mono-morphemic and hence may continue to exercise phonological selection on functors which merge with its V-equivalent instantiation.

As it turns out, however, this may very well be the case for roots embedded within binyanim, but once the bigger picture is considered, not all Semitic verbs can be considered bi-morphemic or, for that matter, embedded within a binyan. On the contrary, a substantial number of roots do behave exactly like the English root, in as much as they continue to exercise phonological selection beyond their verbalizing domain. Insofar as the picture in (14) does not characterize distinct grammars of distinct languages, but can be found within a single language, it provides the strongest evidence for the bi-morphemic structure of binyanim vs. the mono-morphemic structure of V-equivalent roots, in English or in Semitic. In Hebrew, such V-equivalent roots, I suggest, are those verbs which occur in so-called “binyan I”, at times also called Qal (= ‘light’). I will adopt throughout the latter term, precisely because, as I shall proceed to argue, Qal corresponds neither to a binyan nor, for that matter, to a functor, and its presence does not signal any measure of structural complexity.

11.2.2 How light is Qal?

Some background is in order before we proceed to investigate the behavior of Qal. Importantly, Qal is by no means an exotic formation—on the contrary, some 40% of Hebrew verbs are of this pattern, nearly twice as many verbs as those occurring in any other single binyan. Nonetheless, and with extremely few exceptions, it is not productive in the language, and new verbal formations, of which there are many, favor, instead, binyanim III or V.16

15 Assuming that some binyanim may be derived from others. See fn. 14 as well as discussion in section 11.5.
16 Corpus analyses of written text (newspaper) return the following percentages for types (participles excluded). Spoken language is likely to return a lower percentage for II and higher percentage for both III and V:

<table>
<thead>
<tr>
<th></th>
<th>I</th>
<th>II</th>
<th>III</th>
<th>IV (III-passive)</th>
<th>V</th>
<th>VI (V-passive)</th>
<th>VII</th>
<th>VIII (NITRaR,R_eR)</th>
</tr>
</thead>
<tbody>
<tr>
<td>(i)</td>
<td>41.3%</td>
<td>13%</td>
<td>14.2%</td>
<td>0.8%</td>
<td>19.3%</td>
<td>1.2%</td>
<td>9.8%</td>
<td>0.4%</td>
</tr>
</tbody>
</table>

(cont.)
Turning to the morphological properties of Qal, we find that here, in contrast with the picture in (5) and even more so with the picture in (8), there are quite a few cases of idiosyncratic, root-specific realizations. Within the S-marking domain, and considering solely roots with radicals which are otherwise immune to independent phonological processes (mostly glides and some gutturals), we noted that each of (active) binyanim II–VII comes with exactly one fixed perfective and one fixed imperfective stem. Furthermore, and insofar as the imperfective stem is the base for future (and subjunctive), for the imperative, and for the infinitive (and for the participle as well, for III, V, and VII), its form is fixed across these instantiations. For Qal, on the other hand, there exist two imperfective stem variants, and the choice between them is contingent on the root. In an interesting additional twist of idiosyncrasy, both imperfective stems may be associated with the same root, one realized in the future (and subjunctive) forms and the other realized in the infinitive (stem vowels bold):

\[
\begin{array}{ccc}
\pi^\sqrt{\text{SRP}} & \pi^\sqrt{\text{GDL}} & \pi^\sqrt{\text{SKB}} \\
\text{perfective} & \text{sarap} '\text{burn}' & \text{gadal} '\text{grow. INT}' & \text{šakab} '\text{lay down}' \\
\text{imperfective} & \text{li-srop} & \text{li-gdal} & \text{li-škab} \\
\text{infinitive} & \text{li-srop} & \text{li-gdal} & \text{li-škab} \\
\text{fut/jussive} & (yi)srop & (yi)gdal & (yi)škab
\end{array}
\]

Similar numbers emerge from the verb list in `<http://en.wiktionary.org/wiki/Category:Hebrew_verbs>` (476 types):

\[
\begin{array}{ccccccc}
\text{I} & \text{II} & \text{III} & \text{IV} & \text{V} & \text{VI} & \text{VII} & \text{IX (HITRuR, CaR)} \\
& & & & & (\text{V-passive}) & (\text{VII-passive}) \\
\text{III-passive} & & & & & (\text{V-passive}) & & \\
36.1\% & 7.4\% & 22.7\% & 3.8\% & 17.4\% & 1.5\% & 10.7\% & 0.4\% \\
172 & 35 & 108 & 18 & 83 & 7 & 51 & 2
\end{array}
\]

As demonstrated amply in the work of Bolotsky (1978, 1999) and Bat-El (1989, 1994a), patterns of borrowing in Hebrew obey morpho-phonological constraints related both to the phonological properties of the forms borrowed and to the morpho-phonology of the various binyanim, resulting in favoring binyan III, which tolerates four-consonant roots more easily than binyan V, and with V coming as close second. This, however, falls short of explaining why both innovations and borrowings in Qal are virtually nonexistent. To illustrate, a recent innovation, based on the noun berez 'faucet' and meaning ‘to fail to meet an obligation’ came into the language as intransitive (with a dative Experiencer) and in V (hibriz), but there are no prima facie phonological (or semantic) constraints that would have barred it from occurring in Qal, presumably as *baraz, with the same Content. The only borrowing into Qal that I am aware of is clearly a result of the fact that Qal, but no other pattern, accommodates an (overt) two-radical root, coupled with the fact that in the infinitive of Qal, such two-radical roots may be separated by the vowel /u/ (qam, la-qum ‘rise’, ‘to rise’). The English verb move, thus reanalyzed as the root *\pi^\\sqrt{\text{MV}}, has been integrated into Qal, no doubt greatly enhanced by the fact that in the infinitive, the phonology of the source verb can be preserved as such, i.e. la-mov, ‘to move’ (with thanks to E. Doron, p.c., for pointing out this case to me).

17 Two forms exist in the benoni as well—RoReR, alongside RaReR, the latter primarily with statives. There is no correlation between these and the choice for the imperfective stem either. The Arabic equivalent of Qal shows even wider variation, a matter not reviewed here for reasons of space, but see Naji (2010) for an interesting discussion.
Further illustrating the ability of Qal to tolerate idiosyncratic information, we note that the few cases of truly irregular verbs in Hebrew (notably, the verbs *laqax* 'take' and *natan* 'give')—where variations in radical instantiation cannot be traced back to predictable phonological operations, but must be otherwise listed—are in Qal. Even more telling is the fact that when those very same roots occur in any other binyan, their idiosyncratic properties vanish:

<table>
<thead>
<tr>
<th></th>
<th>Qal</th>
<th>Qal</th>
<th>II</th>
<th>II</th>
<th>VII</th>
</tr>
</thead>
<tbody>
<tr>
<td>perf.</td>
<td>*(\pi \sqrt{\text{QaX vs. } \pi \sqrt{\text{NTn vs.}})</td>
<td>*(\pi \sqrt{\text{LKD vs. } \pi \sqrt{\text{N?l}})</td>
<td><em>laqax</em></td>
<td><em>natan</em></td>
<td><em>nilqax</em></td>
</tr>
<tr>
<td>imperf. inf</td>
<td><em>la-qaxat</em></td>
<td><em>la-tet</em></td>
<td><em>le-hillaqax</em></td>
<td><em>le-hinnaten</em></td>
<td><em>le-hillaqqe'ax</em></td>
</tr>
<tr>
<td>fut/subj</td>
<td><em>(yi)qax</em></td>
<td><em>(yi)ten</em></td>
<td><em>(yi)llaqax</em></td>
<td><em>(yi)hinnaten</em></td>
<td><em>(yi)llaqqe'ax</em></td>
</tr>
<tr>
<td>jussive</td>
<td><em>(yi)lkod</em></td>
<td><em>(hi)n?al</em></td>
<td><em>(yi)llaaked</em></td>
<td><em>(yi)hinn?el</em></td>
<td><em>(yi)llaqqe'ax</em></td>
</tr>
</tbody>
</table>

For derivatives (including participles), the picture is even less coherent. A small, but rather informative sample is in (17). While at least statistically, the dominant forms are as in (17a), there are actually at least two forms for the active participle (cf. 17p); and the derived nominal may be expropriated from just about any another binyan (cf. 17c, d, g, l), represent an altogether idiosyncratic variant (cf. 17e), and may further be imported from altogether outside the verbal system, and represent a nominal pattern, a “mi\(\text{s}\)qal” (cf. 17f, g, h). Finally, in some intransitive contexts, possibly, but not conclusively stative, the “passive” participle form is effectively interchangeable with that of the active, and while some roots allow both (e.g. 17m), others only allow one (e.g. 17n), and yet others allow both, but with widely varying Content (e.g. 17j). It is further worthwhile noting that no clustering of properties of any sort is attested. While the \(C_{N[V]}\) realization of Ra\(\text{s}\)aM ‘register’ in (17l) is expropriated either from III or from V, the participles of III and V are excluded. While harvest terms often occur with a specific mi\(\text{s}\)qal, RaRiR, this correlates with the possibility of \(C_{N[V]}\) from III in (17g), but not in (17h). While the \(C_{N[V]}\) realizations in (17i) have two instantiations per root, and both possible as AS-nominals (a matter already discussed in Chapter 5), the forms in (17j) likewise appear to have two morphologically identical instantiations of N associated with them, but in these cases, the Biblical forms can never function as AS-nominals, suggesting that while they might be instances of some C\(\text{N}\), that N-functor does not take V as its CSS, i.e. it is

---

18 With “mi\(\text{s}\)qal”, lit. ‘meter’, the traditional term for nominal morphological patterns.
not an instance of $C_{N[v]}$. Scattered additional gaps and failures to generalize should be amply obvious:

\[(17)\]

<table>
<thead>
<tr>
<th>Perfective</th>
<th>$C_{N[v]}$</th>
<th>Pres. prtcp.</th>
<th>past prtcp.</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. ŠaMaR</td>
<td>ŠMiRa</td>
<td>ŠoMeR</td>
<td>ŠaMuR</td>
</tr>
<tr>
<td>KaTaB</td>
<td>KTiBa</td>
<td>KoTeB</td>
<td>KaTuB</td>
</tr>
<tr>
<td>b. BaGaD</td>
<td>BGiDa</td>
<td>BoGeD</td>
<td>*BaGuD</td>
</tr>
<tr>
<td>c. RaQiD</td>
<td>??RQiDa</td>
<td>RoQeD</td>
<td>*RaQuD</td>
</tr>
<tr>
<td>(RiQQeD, III)</td>
<td>RiQQuD (III)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>d. KaBař</td>
<td>??KBiša</td>
<td>KoBeš</td>
<td>KaBuš</td>
</tr>
<tr>
<td></td>
<td>KiBBuš (III)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>e. ?aBaD</td>
<td>*?aBiDa</td>
<td>?oBeD</td>
<td>*?aBuD</td>
</tr>
<tr>
<td></td>
<td>?aBoDa</td>
<td></td>
<td></td>
</tr>
<tr>
<td>f. 'aBaD</td>
<td>*'abIDA</td>
<td>'oBeD</td>
<td>'aBuD</td>
</tr>
<tr>
<td></td>
<td>'aBeDa β oBDaN (mišqal)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>g. 'aSaP</td>
<td>(?)'aSiPa</td>
<td>'oSeP</td>
<td>'aSuP</td>
</tr>
<tr>
<td>(*'iSSeP III)</td>
<td>'iSSuP (III)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>'aSiP (mišqal)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>h. QaCaR</td>
<td>QGirA</td>
<td>QoCeR</td>
<td>QaCuR</td>
</tr>
<tr>
<td></td>
<td>*QiCCuR</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>QaCiR (mišqal)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>MaSaQ</td>
<td>MSiQa</td>
<td>MoSeQ</td>
<td>(?).MaSuQ</td>
</tr>
<tr>
<td></td>
<td>*MiSSuQ</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>MaSiQ (mišqal)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>i. ReCiXa</td>
<td>ReCaX</td>
<td>*RaCaX</td>
<td></td>
</tr>
<tr>
<td></td>
<td>ReRaX (BH)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>QTiLa</td>
<td>QoTeL</td>
<td>QaTuL</td>
</tr>
<tr>
<td></td>
<td>QeTeL (BH)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>TBiXa</td>
<td>ToBeaX</td>
<td>TaBuA</td>
</tr>
<tr>
<td></td>
<td>TeBaX (BH)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>HaRiSa</td>
<td>HoReS</td>
<td>HaRuS</td>
</tr>
<tr>
<td></td>
<td>HeReS (BH)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>j. MeSiRa</td>
<td>MoSeR</td>
<td>(MaSuR)</td>
<td></td>
</tr>
<tr>
<td>MeSeR (BH)</td>
<td>(MaSuR) (‘devoted’)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>ŠeBiRa</td>
<td>ŠoBeR</td>
<td>ŠaBuR</td>
</tr>
<tr>
<td></td>
<td>ŠeBeR (BH)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>k. PaTaR</td>
<td>PTiRa</td>
<td>PoTeR</td>
<td>PaTuR</td>
</tr>
<tr>
<td></td>
<td>PiTaRoN (mišqal)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>l.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
The picture which emerges from the distribution of realizations within the domain of Qal therefore significantly differs from that which is attested with the other binyanim. On the other hand, it is highly reminiscent of the way in which English roots differ from the Hebrew derivatives in II–VII. As in English, we find multiple possible spellouts linked to the same C-functors. As in English, we find that some of these spellouts may co-occur with the same stem without variation in Content. Most crucially, and as in English, but strikingly different from the behavior of verbs in binyanim II–VII, we find that the choice of spellout is item-specific, and that choices do not cluster. That the active and passive participle of yaṣab ‘sit’ or rakab ‘ride’ should be effectively synonymous may or may not require a stative configuration, but this only goes so far in terms of accounting for the fact that the equally stative ?amad ‘stand’ or yaṣan ‘sleep’ do not allow the passive participle at all. That heres ‘destruction’ should be available to nominalize haras ‘destroy’, alongside harisa, and give rise to a licit, fully compositional, (passive) AS-nominal, but that šeber ‘break, fracture’ should not be likewise available to give rise to an AS-nominal; for the verb šabar ‘break (trans)’ likewise is rather hard to derive from general principles. But if we are correct in assuming that item-specific selection of realization, the absence of clustering, and the availability of multiple realizations are all the hallmarks of root selection, then it emerges that in Qal, but in no other binyan, root selection is available in a fashion rather similar to that of English. If we continue to further subscribe to the view that root selection must be local, it emerges that while binyanim II–VII involve at the very least a bi-morphemic structure, consisting of a (categorized) root and some realization of $C_V[X]$, that is not the case for Qal where subsequent affixation appears, for all intents and purposes to be merging directly with the root.
What, then, is Qal? Clearly it cannot be a binyan, if by binyan we refer specifically to a C-functor that may merge with roots. Suppose, rather, that Qal cases represent the rendition of a root V-equivalent by whatever structure dominates it, be it C-functors such as $C_{N[V]}$, or alternatively segments of an Extended Projection. In contrast with the structures in (7) a root such as $\pi^\sqrt{GDL}$ could be embedded within a structure such as that in (18). We may now proceed to assume that the vocalization of Qal forms follows some general default guidelines in the language in general, but with a possible pre-emption from the root, thus determining, for example, the correct realization for the imperfective stem in various contexts and similar.\(^{19}\)

\[\text{(18)}\]

![Diagram](image)

When merging with e.g. $C_{N[V]}$, on the other hand, a root such as $\pi^\sqrt{RSM}$ would be as follows:

\[\text{(19)}\]

<table>
<thead>
<tr>
<th>$C_{N[V]}$</th>
<th>$C_{V^\sqrt{RSM}}$</th>
</tr>
</thead>
<tbody>
<tr>
<td>i-a</td>
<td>rešima</td>
</tr>
<tr>
<td>i-R₂-u</td>
<td>riššum</td>
</tr>
<tr>
<td>ha-a-a</td>
<td>haršama</td>
</tr>
</tbody>
</table>

\(^{19}\) I leave aside here the question of whether or not the vocalic realization of Qal forms in the perfective and the imperfective is reflective of some default realization patterns associated specifically with S-marking within those domains, a position advocated by Faust (2010a). Another possibility would be to suggest that /a/ is the default vocalization in Semitic in general and in Hebrew in particular, a suggestion made in a different context by Bat El (1994b) as well as by Guerssel and Lowenstamm (1996). See also Faust (2010b), following Goldenberg (1994) for some discussion on the interaction between such default markings and the specific realization of the vocalic melody in III and V. Crucially, we note, the question only emerges internal to the S-marking domain, as when the root merges with a C-functor (e.g. with $C_{N[V]}$) the vocalization is unique and unambiguously linked to the specific realization of the merging C-functor (and see fn. 20 for some relevant comments).
It is worthwhile noting that the structure in (19) is effectively that of an R-nominal, insofar as no event structure merges with \([c=v\sqrt{\text{ršm}}]\). Embedding \([c=v\sqrt{\text{ršm}}]\) under event structure, however, should have relatively little effect on the spellout possibilities associated with it, precisely because the root would still be able to locally affect the realization of \(C_N[V]\), as discussed in some length in Chapter 10, section 1. We note, finally, that a certain specialization of forms is available on a root-by-root basis. Thus insofar as there are three possible instantiations of \(C_N[V]\) when it merges with \([c=v\sqrt{\text{ršm}}]\), one is primarily used in its atomic Content (R-nominal) context (\(\text{rešima} ‘\text{list}’\)), and one is favored in transitive (AS-nominal) context (\(\text{riššum} ‘\text{listing, registration}’\)), although both \(\text{haršama} ‘\text{registration}’\) as well as somewhat marginally \(\text{rešima}\) are available in such AS-nominal transitive contexts as well. The specialization of such forms remains, crucially, root-specific. Thus although \(\text{riššum}\), a III-\(C_N[V]\), is transitive and occurs as an AS-nominal, \(\text{riqqud} ‘\text{dance}’\), similarly a III-\(C_N[V]\) instantiation associated with otherwise Qal verb \(\text{RaQad}\), is altogether impossible as either transitive or as an AS-nominal (cf. 17c). For \(\sqrt{\text{ršm}}\), we may now assume three distinct listed phonological realizations for \(C_N[A]\) which are available, at least in principle, in all cases in which \(\sqrt{\text{ršm}}\) merges with \(C_N[V]\). Insofar as Content distinctions are discernible, on the other hand, we predict them to emerge exclusively in R-nominals, and based on the phonological realization. Little else needs to be said precisely because, or so it appears, selection by roots exhibits neither clustering nor systematicity and allows for multiple realizations of the same functor, differing in this, from the selection exercised by a binyan.

In Chapter 5, section 7 I argued in some detail that in a well-defined class of Hebrew AS-nominals, the spellout of \(C_N[V]\) is sensitive to the internal event structure embedded under the derived nominal itself. Specifically, for a well-defined class of verbs, there exist two possible realizations for \(C_N[V]\), one associated, morphophonologically, with the Biblical vocabulary layer of the language (BH) and the other with the Rabbinical layer. The former, I suggested, is only licit in passivized AS-nominals. Importantly, the class of verbs which exhibits the alternation is small and its membership is idiosyncratic. Predictably, at this point, we find that all relevant verbs are in Qal, the only verbal instantiation which does not fix its nominalizer, and hence the only one in which C-functor sub-specialization, as expressed phonologically, may emerge. Taking the structure in (19) as our starting point, and assuming the Rabbinical instantiation (\(i-a\)), by far the most frequent, to be the default, non-selected form across all roots in both passive and active derivations, what emerges is the picture in (20) (and recall that \(P-Vc\) is privative and that spellout is optional at any given phase; cf. (7) and related discussion. Intermediate ExP-segments omitted for expositional reasons):

---

20 For the Qal in (19) as well as for the binyanim II, III, V (and with VII excepted, see section 11.5 for some relevant comments) the vocalic information of \(C_N[V]\) always pre-empts whatever vocalic information may otherwise be associated with the embedded (verbalizing) ExP-segments, if there are any (some residual vocalic sharing notwithstanding). In contrast, prefixal information as well as gemination is systematically maintained as illustrated in (i):
In turn, it is equally clear that such pre-emption is directly linked to the fact that the realization of $C_N[v]$ is specified by the binyan. Similarly, within the adjectival domain, we see patterns of pre-emption associated with either mišqal or root, as in (ii):


The behavior, in turn, contrasts with that of unselected realizations. To illustrate, when $C_N[a] /_π/ut$ attaches to adjectives, de-verbal or otherwise, no such effect is attested, and the vocalic realization of the original A stays intact. In turn, that /_π/ut/ is not a selected form must be the case given the fact that it attaches freely to borrowed forms as well as to derived adjectives:

(iii) a. mešorab(IV)→ mešorabut mušqa?(VI)→mušqa?ut ‘involved’ ‘involvment’ ‘invested’ ‘investedness’

b. qal → qalut tippeš → tipşiut ‘easy’ ‘easiness’ ‘stupid’ ‘stupidity’

c. higayon → hegnyoni → hegnyoniut yisrael → yisraeli → yisraeliyut ‘reason’ ‘rationality’ ‘Israel’ ‘Israeli’ ‘Israeliness’

d. maximali → maximaliyut trockišti → trockištiut ‘maximal’ ‘maximality’ ‘trotskyist’ ‘trotskyism’

One might be tempted to propose that this picture supports a view of the binyan as a root, of sorts, rather than an instance of $C_V[x]$, as suggested here. Specifically, the binyan would be categorially unmarked and come with a specific derivational realization class consisting of multiple vocalic realizations in distinct dominating categorial contexts. Such a proposal, however, would only serve to kick the problem one step up. If, as suggested here, $C_N[v]$ may merge not only directly with a root, but also with members of $[Ex[V]]$, the verbal Extended Projection (e.g. in AS-nominals cf. (11b)) the binyan, even if a root, would be rendered V-equivalent prior to merging with $C_N[v]$. If V-equivalent constituents were to be intrinsically tied with a particular vocalic realization, as must be assumed by the binyan-as-root approach, the pre-emption of the verbal vocalic realization once the V-equivalent binyan/root merges with $C_N[v]$ would again be necessary. However, if $C_N[v]$ can pre-empt verbal vocalic melody, there remains little morpho-phonological reason to assume that binyanim are not instances of $C_V$. For some more comments on this matter, see section 11.3.2.
The conclusion from the foregoing discussion is quite clear. Qal, so called, is not a C-functor. Precisely because it is not a C-functor, it fails to define a derivational realization class. A “derivational realization class” as the term is used here, entails a C-functor (i.e. a projecting category) with its own phonological index, thereby capable of selecting a specific array of consistent realizations across all its occurrences. As Qal is not a C-functor, no such clustering is predicted, nor is it attested. Rather, and again precisely because there is no inherent reservoir of realizations that are otherwise associated with Qal or a C-functor to carry them, roots are, so to speak, on their own, very much in the same way as they are in English. Given its non-vocalic nature, the Semitic root must, of course, retrieve a vocalic melody somewhere. Such vocalic melodies may emerge from linearization conventions in the context of S-marking, or alternatively, from an assortment of otherwise available realizations of functors and categorized constituents otherwise available. The haphazard picture in (18), heavily contingent, as it is, on root-specific selection as well as on the exaptation of otherwise available forms utilizing the same root, is not only directly to be expected; it also follows, as shouldn’t be very surprising at this point, the very same pattern that English roots follow.

11.3 Categorization and Mono-morphemic Verbs

11.3.1 Heads up
I have concluded that Qal and its apparent “derivatives” result from a direct merger with the root, while binyanim II–VII and their (veritable) derivatives always involve a preliminary merger of $C_v[x]$ with the root preceding any subsequent merger. In turn, the picture that emerges can serve as a testing ground for claims previously made in the context of English concerning the difference between merger with a (categorized) root and merger with a constituent otherwise headed by a functor, and specifically, all those which emerge from domains of locality. By way of summarizing, note that the picture of the Hebrew verbal system as just outlined crucially entails that the Qal verb (or rather V-equivalent constituent) is a mono-morph which exhaustively contains the root, and that as a result any element which merges with the Qal verb is within the local domain of the root and susceptible to whatever realization information is stored with it. Not so, however, II–VII verbs, which are, at the very least, bi-morphemic, and where the root is embedded within the projection of some C-functor. In these cases, the local domain of the (C-equivalent) root only extends to the first C-functor that merges with it, that of the specific binyan. Beyond that, the realization of any subsequent C-functors or S-marking is determined by the binyan and not by the root. As such, then, the picture is fundamentally incompatible with the claim put forward in Distributed Morphology and much subsequent work according to which roots, within syntactic structures, are always category-less, and categorization may only emerge in the context of a branching structure. Within the DM system, then, and insofar as Qal verbs are clearly verbs, they must be (at the very
least) bi-morphemic (with the root adjoining to \( v \) with some instantiation, including potentially \( \emptyset \)), and as such, have the very same structure as II–VII verbs. \( Qal \) therefore, would perforce have at the very least the structure in the diagram in (10), extended here to cover \( Qal \) as in (22). In contrast, what we propose here is the picture in (23):

\[
\text{(22)}
\begin{array}{c}
\text{C}_{x[X]}, \text{ExS} \\
vocalic\ melody
\end{array}
\begin{array}{c}
\text{C}_{v[X]} \{Qal\ II, III, V, VII\} \\
\left[ c_{v}^{\pi \sqrt{RRR}} \right]
\end{array}
\]

\[
\text{(23) a.}
\begin{array}{c}
\text{C}_{x[X]}, \text{ExS} \\
vocalic\ melody
\end{array}
\begin{array}{c}
\text{C}_{v[X]} \\
\text{C}_{v[X]} \{II, III, V, VII\} \\
\left[ c_{v}^{\pi \sqrt{RRR}} \right]
\end{array}
\]

\[
\text{(23) b.}
\begin{array}{c}
\text{Qal} \\
\text{ExS} \\
default\ vocalic\ realization
\end{array}
\begin{array}{c}
\left[ c_{v}^{\pi \sqrt{RRR}} \right]
\end{array}
\]

As should be patently clear, the assumption that \( Qal \) is an instance of \( C_{v[X]} \), or of \( v \), as in (22), is tantamount to the claim that \( Qal \) is a binyan. If so, however, we are directly and immediately deprived of any ability to account for the systematic differences between \( Qal \) and bona fide binyanim, rendering both the idiosyncratic, root-determined properties of the former and the complete absence of such idiosyncrasies for II–VII a mystery.

When we turn, on the other hand, to the contrastive structures in (23) and to their predictions, we find that they are no more than a recasting, in Hebrew-specific terms, of the picture already advocated for English, where, crucially, the very same situation was argued to guide the difference between, e.g., complex crystallize and liquidate, on the one hand, and, e.g., sing and dance on the other (cf. (24)–(25)), and where the possibility of root-selected realization for past tense for sing vs. the regularity of past tense realization for all -ize/ify/ate ending verbal constituents was derived from root adjacency, in the former, but not in the latter:

\[
\text{(24)}
\begin{array}{c}
\text{ExS} \\
\left[ c_{v}^{\pi \sqrt{SING}} \right]
\end{array}
\begin{array}{c}
\text{C}_{v[N/A]} \\
\{\emptyset,\ ize,\ ify,\ ate\}
\end{array}
\]

\[
\text{(25) a.}
\begin{array}{c}
\text{ExS} \\
\left[ c_{v}^{\pi \sqrt{LIQUID}} \right]
\end{array}
\begin{array}{c}
\text{C}_{v[A/N]} \\
\{ize,\ ify,\ ate\}
\end{array}
\]

\[
\text{(25) b.}
\begin{array}{c}
\text{ExS} \\
\left[ c_{v}^{\pi \sqrt{SING}} \right]
\end{array}
\begin{array}{c}
\text{C}_{v[A/N]} \\
\left[ c_{v}^{\pi \sqrt{LIQUID}} \right]
\end{array}
\]
11.3.2 Alternative perspectives?

Part and parcel of the system propounded in Distributed Morphology is the claim that some affixes, C-functors in our terminology, merge directly with roots which otherwise remain without category in these structures. Alongside (24), then, (and with v replacing our \( C_{v[x]} \)) the root in DM may merge with \( n \) (or \( C_n \)) as well as \( a \) (or \( C_a \)), with realizations such as \{ation, al, ance\} as well as \( \emptyset \) and possibly *ity* for \( n \) and realizations such as \{ous, ive, al, ic, \( \emptyset \)\} for \( a \). Crucially, in such a system, realizations such as *ation* or *ance* are not contingent on merger with a \( v \) constituent, and for e.g. *crystallization*, the realization of \( n \) as *ation* is contingent on *size* as a phonological string, and not on the fact that it projects \( v \) (i.e. it is an instance of \( C_{v[x]} \)). In contrast, *ing*, likewise a realization of \( n \), is only licensed in the context of a merger with \( v \) (and similarly, realizations of past tense). When *ing* spells out a merger with *crystallize* to give rise to *crystallizing*, then, it is specifically the latter’s status as \( v \) that matters, rather than its specific phonological realization.

Consider now this specific execution when applied to binyan derivatives, e.g. de-verbal nominals. Under one possible execution, such derivatives are on a par with *ing*—they must attach to \( v \), and with \( v \) effectively a binyan. Under such an execution, all derived nominals in Hebrew must correlate with ING nominals in English, and Hebrew does not have ATK nominals (ATK=ation and *kin*). While this is certainly a logical possibility, that would render rather perplexing the fact that Hebrew R-nominals and AS-nominals behave so much like English R-nominals and AS-nominals, the latter both with ATK and with *ing*. More problematic, however, would be any attempt to capture the idiosyncratic inflection patterns as well as the nominalization selection in Qal. Insofar as the selection of the inflection and nominalizer appears contingent on the root, this could not be captured if Qal is \( v \). But if Qal is a root, matters become even more tricky for such an execution. Recall that e.g. \( \pi\sqrt{rsm} \), otherwise occurring in Qal (rašam ‘register, list, note’), can be nominalized with *riššum*, otherwise a nominal realization associated with III, as well as with *haršama*, otherwise the nominal realization of \( V \), although the root does not have a verbal realization in either III or \( V \). To the extent that such nominalizations are otherwise the realizations of a merger with \( v \), they have the characteristics of *ing* and hence should not be licit as nominalizations of a merger with a root, and so should not be allowed as nominalizations of Qal forms, if these are indeed roots. Effectively, and harking back to the putative *ing/ation* distinction, allowing these nominalizers in conjunction with Qal, assuming it to be a root, would amount to suggesting that some roots, in English, may opt to choose *-ing* as their nominal realization, although otherwise *ing* specifically only realizes mergers with \( v \). But such a license to roots would effectively make vacuous the claim that *ing* only realizes mergers with \( v \). Finally, note, such a system would boil down to saying that all AS-nominals in II–VII must involve an instance of \( v \) and are thus instances of AS-*ing* but AS-nominals in Qal are instances of AS-ATK, and do not involve such \( v \). There is, however, no evidence whatsoever that the derived nominals of Qal and of II–VII show any distinct behaviors that could possibly support such distinct structures.
Relevant to this latter point, recall that the structural distinction between ING and ATK nominals is supported, in Distributed Morphology, by the contrast between the obligatory intransitivity of *growth* vs. the possible transitivity of *growing*. Turning to the relevant cases in Hebrew, and if indeed *Qal* nominalizations are instances of direct merger with the root, we expect the *growth/growing* contrast to play itself as distinct morphological instantiations, and specifically, we expect the correlate of English intransitive ‘grow’ in *Qal*, which is indeed the case (gadal), and the transitive correlate of ‘grow’ in some bona fide binyan, which is likewise the case with giddel, transitive ‘grow’ and based on the very same root, ḫ√gdl, occurring in III. Alas, the correlation turns out to be rather short-lived. Specifically, if *Qal* is a root, and if roots exclude *External Causers*, we expect it to be intransitive whenever there exists a correlate with an *External Causer*. The opposite picture, however, emerges when we consider e.g. ‘accumulate’. Its intransitive Hebrew correlate is in VII (hiṭṭabber, ḫ√cbb) or in II (nešap, ḫ√sp), and it is rather the transitive correlate, *External Causer* included, that is expressed in the *Qal* for both roots (cabar; ’asap).

Of potential relevance is also the fact that some Hebrew AS-nominals prefer a “passivized”, short instantiation, a fact that has been suggested by e.g. Sichel (2010) to correlate with truncated structure, and hence, at least potentially, with roots rather than v, and hence, potentially, with *Qal*. We note, up front, that the postulation of truncated structure is puzzling, precisely because although Short AS-nominals are clearly preferred in some contexts, such Short AS-nominals are systematically transitively interpreted and allow the correlate of a *by*-phrase. If the model for a truncated structure is that of *growth*, the parallelism falls apart instantly, quite simply because *growth* does not allow a *by*-phrase and is clearly only compatible with an intransitive interpretation. This fact notwithstanding, we note that there is absolutely no correlation between the preference for Short AS-nominals and *Qal*. In fact, the binyan that favors Short AS-nominals the most is III, which is more often than not transitive and almost never unaccusative, while Long AS-nominals in *Qal* (Biblical forms aside) are perfectly licit:

(26) III

(?)tifgun ha.ṭabax ḫ.et hasupganiyot ḫ.tifgun ha.supganiyot ḫ.al yedey ha.ṭabax
frying the.cook om the.donuts frying the.donuts by the.cook
(??)šiktub Rina ḫ.et ha.ma’amar šiktub ha.ma’amar ḫ.al yedey Rina
editing Rina om the.article editing the.article by Rina

(27) Qal

cliyat ha.ṭabax ḫ.et ha.pilpelim cliyat ha.pilpelim ḫ.al yedey ha.ṭabax
roasting the.cook om the.peppers roasting the.peppers by the.cook
ṭarikat Ran ḫ.et ha.ma’amar ḫ.tarikat ha.ma’amar ḫ.al yedey Ran
editing Ran om the.article editing the.article by Ran

The remaining logical option would be, of course, to assume that all derivatives should be equated with root merger, and hence, from the perspective of Distributed Morphology, all derived nominals should be ATK nominals and as such always represent a local selection by the root. The flip side of such an assumption within DM
would be the claim that Hebrew does not have the correlates of English ING nominals. Direct mergers with the root would certainly handle well the Qal situation (growth notwithstanding). It would do so, however, at the cost of having to specify independently, for every single root otherwise regularly occurring in II–VII, the realization of its $C_{v[x]}$ and the realization of its $C_{n[v]}$, as well as the realization of its agentive nominals and participial adjectives. In other words, the assumption that II–VII nominalizers merge with a root would model the behavior of all verbs after Qal. The redundancy is costly enough for cases where the root occurs in a single binyan. When the root occurs in more than a single binyan, however, the problems go beyond mere redundancy. The combination of a particular root with distinct binyanim may give rise to distinct Content outcomes, and such Contents may always be the foundation of compositional Content with their correlating $C_{n[v]}$ instances. If, however, de-verbal nominals are derived directly from the merger of distinct $C_{N[v]}$ or $C_{v[x]}$ instances with the root, any hope at tracing compositional Content to its components is lost. Some aspects of this picture are illustrated in (28):21

(28)  

a. Roots occurring in a single binyan

<table>
<thead>
<tr>
<th>$C_{v[x]}$</th>
<th>$C_{n[v]}$</th>
</tr>
</thead>
<tbody>
<tr>
<td>III $π/xyk$– (xiyyek)</td>
<td>III $π/xyk$– (xiyyuk)</td>
</tr>
<tr>
<td>V $π/pťʔ$– (hiptiʔa)</td>
<td>V $π/pťʔ$– (haptiʔa)</td>
</tr>
<tr>
<td>VII $π/znb$– (hizdanneb)</td>
<td>VII $π/znb$– (hizdannbut)</td>
</tr>
</tbody>
</table>

b. Roots occurring in more than one binyan

<table>
<thead>
<tr>
<th>$C_{v[x]}$</th>
<th>$C_{n[x]}$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Qal, I, II, III; V; VII: $π/xšb$</td>
<td>Qal, I, II, III; V; VII: $π/xšb$</td>
</tr>
<tr>
<td>xašab</td>
<td>xašiba</td>
</tr>
<tr>
<td>nexšab</td>
<td>hexašbut</td>
</tr>
<tr>
<td>xiššeb</td>
<td>xiššub</td>
</tr>
</tbody>
</table>

---

21 Even with the intervention of the OCP (see McCarthy 1986 and much subsequent literature), the number of roots actually attested in Hebrew remains well below what would be predicted. In turn, very few tri-consonantal combinations occur only in one binyan. Across the board, it appears, Semitic languages opt to make multiple use of identical triplets, with syntax and Content distinctions marked through the mediation of binyanim, rather than opt for a closer match between such triplets, roots, and either syntax or Content. The options facing the theoretical morphologist are thus clear. If roots do have Content, it must be the case that roots such as $π/xyk$ or $π/pťʔ$ or $π/pqd$ display a massive homonymy, with crisscross relationships and with accidental overlaps in morphological realizations. Alternatively, if roots do not have Content, then roots must be neither more nor less than phonological indices and the emergence of Content must be severed from them. The picture further suggests that the storage, specifically, of multiple phonological indices is costly, but not so, necessarily, is the storage of multiple Content representations; certainly an intriguing result, if corroborated by psycholinguistic research.
Note, specifically, that absent a binyan, relating the realization of the verbal form and the nominal form in (28a) remains a relatively straightforward matter. Accounting for the Content-relatedness, and specifically for the fact that the nominal forms are compositionally derived from the verbal forms, is likewise straightforward, but only if we assume that the consonantal root, as such, has Content from which the Content of the derived compositional form is derived.

Matters, however, become considerably more tricky when more than one instantiation of \( C_V^\{[X]\} \) is available, and especially when the Content relationship between the verbal instantiation and the nominal instantiation is directly predictable from the morpho-phonology of the verbal and nominal form, i.e. when they belong to the same realization class as in (28b). Here, any attempt to correlate the Content of \( C_V^\{[X]\} \) and \( C_N^\{[V]\} \) is simply impossible without a mediating binyan. If the root has (a single) Content—which, if anything, the picture in (28b) would strongly disfavor—such Content would have to be assumed overridden in fully eight out of the forms in (28b), and with the alternative Content emerging, for no obvious reason, in pairs. If, on the other hand, the root does not have Content and Content is assigned to larger constituents consisting of root+\( C_N^\{[V]\} \) or root+\( C_V^\{[X]\} \), it would be likewise unclear why Content should be organized in pairs, nor would it be possible to state the correlations between members of such pairs in terms of their morphological relatedness.

One could assume, finally, that binyanim are pure “inflection classes” in the original Aronoff (1994) sense (i.e. divorced from a derivational function) and consist of realization clusters without entailing additional categorial structure. Roots, in turn, would belong to such inflection classes (possibly more than one), making all binyan instantiations effectively monomorphemic. Such a move, we note, would only solve the problem if we assume that Content is associated specifically with root–binyan combinations which are, thus, inflection classes, making each root–binyan combination effectively a distinct, monomorphemic lexeme with distinct class membership which determines its nominal and verbal realization. However, as in the case of the assumption that the binyan itself is a root (cf. fn. 20), such a system would only serve to shift the problem one level of structure up. Specifically, insofar as such lexemes can be embedded under ExP-segments that would render them \( V \)-equivalent (e.g. in AS-nominals, or, for instance, as in (7b) where by assumption \( P-Vc \) would render a root \( V \)-equivalent), and insofar as such \( V \)-equivalent lexemes can now be nominalized (cf. 11b), the realization of such a nominalization could no longer be an operation on a category neutral lexeme, but would rather have to be assumed to be an operation that is capable of turning \( V \) into \( N \) in some fashion. As the phonological realization of such a nominalizer is identical to that which would be realized directly on the original lexeme, the advantage of assuming a category-neutral lexeme with multiple categorial realization possibilities vanishes, to be replaced with pure redundancy: the
existence of nominal marking which is available as a root realization, on the one hand, and as an operation converting V to N on the other.

The difficulties, in turn, stem directly from the assumption that there are, in our grammar, such things as inherently and permanently category-less nodes—roots—and that as a consequence, all categorized structures are (at the very least) bi-morphemic. If one were to follow this claim, it would be necessary to treat all Semitic verbs as bi-morphemic. Once such a move is made, however, it entails that all derivatives emerge either from merger with a complex structure, and hence outside the local selection domain of the root, or, across the board, only with the root, thereby predicting massive idiosyncrasy where none is attested. This conclusion was already shown to be problematic in English. In Semitic, it goes beyond problematic and proves quite simply impossible to execute.

The alternative developed at some length in this study, by contrast, entails that categorization may emerge without structural complexity, and rather through syntactic equivalence classes. Insofar as verbs now may be monomorphs and contain, exhaustively, the root, verbal derivatives—in such contexts but not otherwise—are within the local phonological domain of the root. Insofar as some verbs are complex, however, no root selection effects are expected, and none, indeed, are attested.

11.4 Semitic Verbs: the Domain of Content

Content was already touched upon in the discussion above, insofar as it was observed that the de-verbal derivatives in (28b) do have compositional Content, although, as was also noted, some of them may have atomic Content as well. Recall that Content matching proceeds as in (3), repeated here as (29). Recall further that the (relatively) early spellout of C-functors vs. the possible delay in the spellout of the root suggested in Chapter 10, section 1 was already strongly bolstered by the discussion in sections 11.1.2 and 11.1.3 above:

(29) Content matching:
   i. En-searching operates by phase on (labeled) bracketed phonological strings.
   ii. The en-search domain must include a C-core.
   iii. Content is assigned optionally but once assigned, cannot be overridden.
   iv. ExP-phase marks a final Content domain.

Suppose we consider now the root “πτρ” which occurs in Qal as well as in all binyanim, and which displays a nice array of compositional and atomic Content combinations, alongside some random gaps (parenthetical forms are possible but dis-preferred):
We note, to begin with, the random gap expressed by the absence of a de-verbal nominal in II with the Content corresponding to 'pass away'. Alongside that gap, we note the emergence in Qal of a de-verbal nominal with the requisite Content, although the Qal verb itself has a distinct Content. We note further the emergence of identical Content for II and VII (alongside a second, distinct Content), although the forms are clearly not derivationally related. Finally, we note the emergence of Content relatedness between III and (one instantiation of) Content in VII, where a derivational relationship is more plausible, a matter I return to in section 11.5.

If we now consider the forms in (30) from the perspective of Content domains, we note that with the exception of (30a), where only one possible domain exists for en-searching, all other representations have either two domains (as in (30b, c)) or three (as in (30h, j) and others). Specifically, all verbal instantiations with the exception of Qal have two Content domains, one which is co-extensive with the root constituent, labeled C=X (➀) and another which spans the domain of root selection (➁). Similarly, derived nominals with Qal include two possible Content domains, one, again, an instance of C=X co-extensive with the root (➀) and the other with the derived nominal in its entirety which, in the case of Qal, is co-extensive with the domain of root selection (➁). Finally, derived nominals corresponding to II–VII systematically include three Content domains—that which is co-extensive with the root (➀), that which spans the binyan and the root and which is the root-selection domain (➁), and finally the domain which spans the binyan+root combination as embedded under a nominalizer, i.e. ➂.22

Recall now that Content matching is altogether optional (and thus nonce strings are licit), but each C-core may be associated with at most one successful en-search. In view of this, we must ask whether Content can, indeed, be matched with each of these domains, including a domain which is co-extensive with a bare root, on the one hand

22 As the reader will no doubt note, the specific nature of the CCS selected by binyanim remains an outstanding question. Specifically, and insofar as C-functors are transitive and must define a Categorial Complement Space, notating our binyanim as $C_{v[X]}$ and labeling roots as $C=X$ in (31) is by way of acknowledging the ongoing need to address this matter, an issue I turn to in section 11.5.
(i.e. domain ➀) as well as a domain that includes a clearly categorized constituent, namely a binyan, as is the case for domain ❼. An attempt at the full derivation of some of the pertinent cases in (30) reveals that the answer to both of these questions is yes. Content can be matched with domain ➀, both when it is embedded under another C-functor, as (32a), and when it is embedded under an ExP-segment, as in (32b). Content, further, can be matched with ❼, as (31a) illustrates. And finally, Content can certainly be matched with ⶈ, be it a binyan or a nominalized Qal, as (31b) and (32a) illustrate:

(31) a. /ɲa'ptaɾa/ (V)
   ➀ Domain of binyan selection
   → C_N[V-V] exponent
   → C_N[V-V] realization: /a-a/ + Fem / /a-a/ + Fem /

   ❼ Domain of Root Selection
   → choice of C_V[x]-V exponent
   → C_V[x]-V realization: /h/ prefix
   → root spellout: suspended.

   (Possible) Domain of Content ➀: no Content matched
   (Possible) Domain of Content ❼, [/,h-] → UTTER CASUALLY
   Domain of Content [❼ + C_N[V-V]] compositional only
   (possible) Domain of Content ❼, [,hapotara/] → CASUAL UTTERANCE
   [,hapotara/] → HAPHTARA; BIBLE RECITING

b. /ʃniptar/ (II)
   ❼ Domain of Root Selection
   → choice of C_V[x]-II exponent
   → C_V[x]-II realization: /n-

   (Possible) Domain of Content ➀: no Content matched
   (Possible) Domain of Content ❼, [/,n-] → DISPOSE OF
   [/,n-] → PASS AWAY

(32) a. /ʃtiral/ (Qal)
   ❼ Domain of Root Selection
   → C_N[V] exponent
   → C_N[V] realization: /ɪ+/-Fem

23 To the extent that /ʃtiral/ in its PASSING AWAY reading has atomic Content, we do not expect it to be licit as an AS-nominal. The prediction is borne out by the ungrammaticality of (ia, b), especially when compared with licit (a’) and (b’):
We note now that insofar as derived nominals in II–VII do allow non-compositional Content, as is the case for e.g. *haphtara ‘haphtara, ritual bible reciting’, and if we are correct in assuming that binyanim are instances of C\textsubscript{V}[\textit{x}], then it must be the case that Content matching cannot be confined to the first instance of categorization, contra Arad (2003, 2005). That Hebrew has both AS-nominals and R-nominals is a

24 The problem, we note, is rather directly relevant to Arad (2005), insofar as the view of binyanim as instances of \(v\) is specifically endorsed, and where, as a result, it is predicted that derived nominals should always be compositional. Arad’s (2005) discussion of derived nominals is very brief but to the extent that they are touched upon, the claim appears to be that they are derived from their verbal binyan counterparts, and that they are, indeed, always semantically compositional, a clearly untenable claim.
matter that was elaborated on in Chapter 3. Recall, further, that non-compositional derived nominals are always R-nominals. In looking for the relevant examples of non-compositional, atomic cases of $C_{n[v]}$, then, we are looking for R-nominals which are clearly derived from verbs, either in specific binyanim or in Qal, and which do have a (compositional) AS-nominal instantiation, as it is only in the presence of the latter that one can be fully certain that the form under consideration does involve a $C_{n[v]}$. Rather fortunately for the present account, such cases are quite common (note that in some of the cases below, the nominal is a head of a compound and the compound itself is non-compositional):25

<table>
<thead>
<tr>
<th>$C_{v[x]}$</th>
<th>$C_{n[v]}$, compositional</th>
<th>$C_{n[v]}$, atomic instantiation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Qal</td>
<td>tapas ‘catch, understand’</td>
<td>tpisa ‘catching, understanding’</td>
</tr>
<tr>
<td></td>
<td>xatak ‘cut’</td>
<td>xatika ‘cutting; piece’</td>
</tr>
<tr>
<td>III</td>
<td>ciyyen ‘remark, note’</td>
<td>ciyyun ‘remark, noting’</td>
</tr>
<tr>
<td></td>
<td>yiššeb ‘cause to sit/settle’</td>
<td>yiššub ‘seating, settling’</td>
</tr>
<tr>
<td></td>
<td>biqqeš ‘ask; search’</td>
<td>biqquš ‘asking, searching’</td>
</tr>
<tr>
<td></td>
<td>civva ‘command’</td>
<td>civvuy ‘command, commandment’</td>
</tr>
<tr>
<td></td>
<td>qibbec ‘gathered’</td>
<td>qibbuc ‘gathering’</td>
</tr>
<tr>
<td></td>
<td>šilšel ‘drop, lower’</td>
<td>šilšul ‘dropping, lowering’</td>
</tr>
</tbody>
</table>

25 VII is, by and large, the binyan which displays the greatest degree of Content–morpho-phonology correlation, a matter I return to in section 11.5. This high degree of predictability accounts, I believe, for the scarcity of atomic Content in nominals of VII. II nominals, on the other hand, are altogether awkward and rarely used, thereby likewise accounting for their rarity or possibly complete absence as non-compositional items.

Alongside the cases in (33) there are cases of nominals as well as adjectives corresponding in particular to the derived nominal and passive participle of III, but nonetheless without an attested verbal source. While the derivational history of such forms is, I believe, ultimately crucial to the understanding of what we call a binyan, these cases are nonetheless left aside for reasons of space. We note that their existence is orthogonal to the matter under consideration here, but see fn. 13 for a brief comment.

26 Grading i.e. an exam requires a light verb: natan ciyyun (lit. ‘gave a grade’). The corresponding verb ciyyen ‘remark, note’ absolutely cannot be thus used.
Within the domain of adjectives derived from passive participles the picture, if anything, is even more striking, with the passive participial forms for Qal, III, and V frequently and overwhelmingly provided with atomic, non-compositional Content:27

<p>| | | |</p>
<table>
<thead>
<tr>
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<th></th>
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</thead>
<tbody>
<tr>
<td>hiblig</td>
<td>‘restrain’</td>
<td>hablaga</td>
</tr>
<tr>
<td>hisig</td>
<td>‘achieve’</td>
<td>hasaga</td>
</tr>
<tr>
<td>hisbir</td>
<td>‘explain’</td>
<td>hasbara</td>
</tr>
<tr>
<td>hiršim</td>
<td>‘impress’</td>
<td>hasama</td>
</tr>
<tr>
<td>hebin</td>
<td>‘understand’</td>
<td>habana</td>
</tr>
<tr>
<td>hiniax</td>
<td>‘lay down’;</td>
<td>hanaxa</td>
</tr>
<tr>
<td></td>
<td>‘assume’</td>
<td></td>
</tr>
<tr>
<td>hitnaxel</td>
<td>‘settle’</td>
<td>hitnaxlut</td>
</tr>
<tr>
<td></td>
<td></td>
<td>hitnaxlut</td>
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</table>

27 For concreteness, and in reference to the structure of passive as in (7b) I assume that atomic Content is assigned to participial adjectives in the boxed context in (i), by assumption entailing a participial realization in the absence of T (see Chapter 5, section 4 for some relevant discussion):

(i) \[ X \in \{\text{Ex[A]}\} \]

Note that \( P-V_c \), by assumption selecting +V rather than either V or A alone, merges directly with the binyan, and that the adjectival categorization of the participle is accomplished through merger with some ExP-segment which is a member of \( \{\text{Ex[A]}\} \), (e.g. DEG). A fuller analysis of participial adjectives as well as a fuller motivation for the structure in (i) is unfortunately outside the scope of this work.
From the perspective of the model under development here, nothing is particularly surprising about the emerging picture. It tallies with what we have seen in English, and fully confirms the proposed domain of en-searching and Content matching as motivated in detail in Chapter 9 and as summarized in (29). We note further that insofar as in Qal, by assumption, the nominalizers merge directly with the root (albeit a categorized one in our system), a model associating Content with first categorization (e.g. that of Arad 2003, Marvin 2002, or Marantz 2007) would predict that atomic Content would be associated with Qal derivatives, but not with derivatives of other binyanim. In the presence of the huge exaptation of nominal forms in Qal, all impossible, in principle, as AS-nominals, this prediction can only be tested relative to the most common and relatively productive realization of C_{N[V]} in Qal, that associated with the Rabbinical form RRiRa. When that form is considered, we find that there are neither more nor less cases of atomic Content here than with III- and V-related C_{N[V]}.

Recall finally that we pondered, in the context of English (cf. Chapter 9, section 4.2), the question of the precise relationship between Content and spellout. Specifically, the question was whether it is the assignment of Content that determines spellout, or is it, alternatively, spellout that feeds into the assignment of Content. By way of endorsing the latter view, I noted the fact that the English pair nation and nature, as well as pairs such as commitment and commission are marked by the existence of two distinct C_{N[V]} realizations each with its own non-compositional atomic Content. Given the identical (pre-realization) structure, it was not clear how an unambiguous Content could be retrieved so as to link the relevant reading with the relevant realization. Specifically, it is clear that the structure alone underdetermines the choice of Content, and that the spellout, specifically of C-functors, serves to narrow down that choice. As I noted in the relevant discussion in section 4.2 of Chapter 9, English may not be the easiest language in which to illustrate the point, precisely because identical C-functors with multiple exponents are relatively uncommon; nor are there many roots that
select multiple realizations. Even further limitations are placed on the system by the existence of default forms that occur outside the domain of root selection. In Semitic, however, multiple exponents for the same C-functor within the domain of the root are clearly the norm, for what are binyanim (or some mišqalim, for that matter) but such exponents of the same \( C_{\sqrt{x}} \)-functor? In fact, as we saw, most roots select more than one such realization. In turn, when exponents occur in the context of the same root, the emergence of distinct Content in the context of identical structure may not be inevitable (cf. e.g. (30c, i)), but is nonetheless very common, with the divergence of Content sometimes so broad that the existence of root homonyms is frequently suggested.\(^{28}\) Importantly, such divergence of Content does not emerge from properties of the binyanim that are used, as no degree of systematicity of interpretation or Content can be discerned in such non-compositional forms. Rather to the contrary, systematic interpretation, when occurring within the binyan system, is always associated with a very high degree of compositionality, rather than atomicity of Content, a matter I return to in section 11.5. Content divergence, on the other hand, turns out to be entirely independent of such factors, and although at times it is possible to trace the historical evolution of the Content across binyan instantiations, any direct root-based Content construction is clearly impossible. A rather extreme case was already illustrated in (30) with the root \( \sqrt{\pi \sqrt{P\sqrt{R}}} \). Another extreme example was already discussed in Chapter 10, and involves the root \( \sqrt{\pi \sqrt{PQD}} \). The relevant paradigm is in (35a), supplemented with a few more key illustrations. It is worthwhile noting that while some Content correlations clearly do exist, with few exceptions (e.g. III \( \rightarrow \) VII) they rarely correlate predictably with the choice of binyan:

\(^{28}\) Claims that we are dealing here with root homonyms are based on the assumption that roots do have Content, i.e. that they are fundamentally a type of lexeme, and that a divergence of Content suffices to postulate a distinct root. The claim of shared Content is specifically put forward by Arad (2005), who also sets up criteria for determining when such Content is truly shared, and when it is a case of homonymy. The latter, in turn, turns out to be necessary even in cases where Content-relatedness appears rather straightforward, but where such relatedness is nonetheless extremely difficult to subject to rigorous criteria. The result is such an extreme proliferation of root homonymy, and such a rarity of any one root actually occurring in more than one syntactic context, that the system, notwithstanding its syntactic execution, is at the end of the day extremely lexicalist in nature. Any such fragmented picture, we note, raises the question as to why any system should opt for such massive homonymy, especially given the fact that possible consonantal triplets remain so greatly underused.

I have argued here, throughout, that roots do not have Content in isolation, making the issue moot and with the consequence that the notion of roots as homonyms is an incoherent one. As already noted in Chapter 8, section 1.2, nothing in the system presented here forces a separate listing in English of (the) bank with its 'financial institution' reading and (the) bank in its 'river shore' reading. Rather, and insofar as they are truly phonologically identical in all their instantiations, I assume that these are disambiguated solely by context.
We note now that even if we assume that Qal is underived in the sense already noted, the other binyanim are clearly derived, and insofar as Content is assigned to them, it is assigned to them in the context of a specific C\textsubscript{v[x]} exponent. Short of the Qal instantiation, all other forms in e.g. (35a), four in all, have the structure \[\text{C}_{\text{v[x]}}^{\pi_{\text{PQD}}}\], making any Content matching on the basis of such a representation clearly hopeless. A considerably better execution, then, would have, as the input to en-searching, a representation in which the specific exponent of C\textsubscript{v[x]} has already been chosen, allowing Content matching to proceed so as to distinguish the relevant representations:

\[\text{C}_{\text{v[x]}}^{\pi_{\text{PQD}}} \rightarrow (\text{II})/_{n}n-/[\text{C}_{\text{x}}^{\pi_{\text{PQD}}} \rightarrow \text{BE.AWOL} ]\]

\[\text{C}_{\text{v[x]}}^{\pi_{\text{PQD}}} \rightarrow (\text{III})/_{n}\text{R}_{2-}/[\text{C}_{\text{x}}^{\pi_{\text{PQD}}} \rightarrow \text{COMMAND} ]\]

\[\text{C}_{\text{v[x]}}^{\pi_{\text{PQD}}} \rightarrow (\text{V})/_{n}h-/[\text{C}_{\text{x}}^{\pi_{\text{PQD}}} \rightarrow \text{DEPOSIT} ]\]

\[\text{C}_{\text{v[x]}}^{\pi_{\text{PQD}}} \rightarrow (\text{VII})/_{n}h\text{it}-/[\text{C}_{\text{x}}^{\pi_{\text{PQD}}} \rightarrow \text{BE.COUNTED} ]\]
It is worthwhile noting, before concluding this section, that the logic of the system excludes the existence of multiple exponents anywhere except where root-selected. While there are multiple exponents in Hebrew of $C_n[y]$, within the binyan system, multiple exponents are never possible, nor is a competition ever an option. Rather, each binyan selects a single realization of $C_n$, its trivial default, so to speak. The picture in (36), then, cannot be replicated for more complex constituents, where, by definition, the root is no longer local and may not impact the realization of functors. Each of the forms in (36), in other words, can only have a single realization as its derived nominal or as its participle. It thus emerges that if Content is sensitive to the spellout of C-functors, it is precisely within the local domain of the root that the broadest array of Content possibilities may emerge in the context of an identical structure, consisting exactly of a root and the first C-functor that merges with it; because it is within that domain, but no others, that multiple exponents would be possible. While, atomic Content may of course, be further associated with the nominalization of each binyan, given the fact that each binyan has exactly one nominal realization, there could be at most one phonological realization that would correspond to a compositional Content, as well as, possibly, to one or maybe more atomic Contents. The richness of possibilities expected in the local domain of the root, however, is neither expected nor attested upon further embedding. This result, in turn, is neither identical to nor does it derive from constraining Content to the domain of first categorization; nor is the latter empirically correct. The abundance of Content possibilities within the domain of the root may, nonetheless, mislead one to believe that the domain of the root is privileged, Content-wise. In actual fact, the domain of the root is, indeed, privileged; but in allowing an abundance of realization possibilities, barred outside the domain of the root. Content, on the other hand, can and does allow bigger domains, a matter that has, by now, been amply demonstrated for both English and Hebrew.

11.5 Categorial Complement Space in the Semitic Verbal System: Road Signs

11.5.1 Summary

In the previous sections, I outlined a preliminary approach to a syntactic treatment of Semitic word formation. Although a relatively narrow domain has been examined here, it is my belief that the convergence of results between English and Hebrew lends robust support to the model that I have constructed throughout this book. Morpho-phonologically, English and Hebrew are about as different as can be imagined, with the output of word formation clearly subject to extremely diverse phonological principles. Roots, in Semitic linguistics, are an age-old linguistic concept and their category-less status was mostly taken for granted, but what could not be and never was taken for granted is that their modes of composition should turn out to be so similar to those which guide English roots, the latter more frequently than not homophonous with well-formed phonological words. No attempt was made in the previous sections to articulate the actual phonological
system that would translate the representations proposed into phonologically licit strings. Rather, an attempt was made to investigate whether the domains of locality and the combinatorial principles that were uncovered on the basis of English would stand a chance in a differently realized system.

The conclusions reached were that indeed, the systems are fundamentally similar. Domains of application were subject to similar constraints; roots, to the extent that they could be identified in the two systems, exercise the same type of selection in both, and behave the same way; domains of rule application, be they responsible for Content matching, for phonological selection, or for S-marking spellout, turned out to be amenable to an absolutely identical formal description. In both systems, independent evidence converged to allow us to conclude that:

(37)  

a. Roots exercise phonological selection within their local merger domain.  
b. Within their local domain, roots may allow multiple realizations for the same C-functor.  
c. Roots re-merge and re-project as ExP-segment heads, thus effectively extending their local domain.  
d. Content is matched with the spellout of the C-core; and as a result:  
e. C-functors must be allowed to spell out within their C-core, but  
f. S-marking realization is later, outside the C-core.

Suppose we turn, however, to a remaining issue which is of some importance and which was glossed over in the discussion above. The issue concerns, specifically, the categorial properties of the complements of the binyan head, by assumption a $C_{n\{x\}}$ of some sort, and hence, by definition, an operator on a Complement Categorial Space. We note that for Qal, as in the structure in (32a–b), the issue does not come up, as the category of the root is straightforwardly determined, e.g. by $C_{n\{v\}}$ in (32a), and by $T$, a member of $\{E_{x\{v\}}\}$ in (32b). Matters, however, are not nearly as straightforward in (31a, b) or, for that matter, in all cases that correspond to (23a). Here, the binyan itself is by assumption $C_{v\{x\}}$, and it merges with the root, which is thus rendered X-equivalent. What, however, is X? The matter, we note, is tricky precisely because the root is not, in itself, fully specified phonologically. Any attempt to spell it out, however, comes at the cost of a rigid syntactic context, making the distribution of the root in isolation extremely difficult to determine. In the remainder of this chapter I will nonetheless attempt an investigation of some possible answers as to the actual category of X, and pursue their logical ramifications, in the hope that these may serve as “road signs” for future research on the properties of Semitic morphology. It might be worthwhile noting that in attempting to determine the categorial membership of X, I will be joining a long and venerable tradition of debate within the study of Arabic grammar, where competing schools of thought date back to the 8th century, with the matter being argued back and forth for many centuries.29

29 Specifically, the Basra School arguing that roots are nominal, and the Kufa school arguing that they are verbal. Evidence brought forth concerned morphological complexity (verbs argued to be more complex than nouns and hence $N\rightarrow V$) as well as phonological complexity (nouns argued to be phonologically dependent on verbal instantiation and hence $V\rightarrow N$), among other relevant arguments. See Owens (1988) for a review.
11.5.2 Verbal Complement Space

In the next few pages, I will outline a preliminary argument in favor of considering binyanim at least at times to be an instantiation of $C_{V[V]}$. The discussion is intended to establish the prima facie plausibility of such a conclusion. It is not, however, intended to exclude the possibility that alongside their $C_{V[V]}$ instantiations, some binyanim may also have a $C_{V[N/A]}$ one. See section 11.5.3 for some brief comments.

If binyanim are instances of $C_{V[V]}$, then $X$ is $V$, i.e. the root merging with $C_{V[V]}$ in (23a) is $V$-equivalent. This option is, of course, entirely in line with the claim that Qal verbs are instances of a root rendered $V$-equivalent by either a C-functor or an ExP-segment such as ASP$_Q$ or T. Insofar as Qal verbs tell us that vocalization may be a matter of root selection (e.g. in conjunction with S-marking or C-functors), we note that roots that are embedded under a binyan could no longer determine such vocalization, as they are no longer in local relations with any S-markers or C-functors. This factor in itself, however, hardly suffices to exclude them as instances of $V$-equivalent constituents, with vocalization in turn chosen by the binyan, by some dominating ExP-segment (as is the case in P-Vc), or through a combination of properties coming from the binyan and from dominating ExP-segments or C-functors.

In turn, the consequences of postulating the binyanim as $C_{V[V]}$ and of allowing a $V$-equivalent constituent to be embedded under a binyan amounts to the suggestion that a $V$-equivalent constituent which exhaustively contains the root is embedded under each such binyan. As Qal, by assumption, is precisely such a $V$-equivalent constituent, it amounts to the claim that an instance of Qal is embedded within each binyan, and hence, that in some sense, all binyanim are derived from Qal, and that as a result, the Content of the binyan as a whole may be composed of the Content of Qal, if it is assigned independent Content, an option certainly possible although to the extent that atomic Content would be available, potentially for the configuration, rather hard to corroborate independently. More importantly, we now predict it to be possible to embed one binyan under another, with (compositional) Content then composed of that associated with the embedded binyan, plus whatever rigid function may be associated with the superordinate binyan.

Recall now that AS-nominals with their specific properties emerge as a result of a “conspiracy”, of sorts, between the fact that AS-nominals are headed by a C-functor with a verbal CCS, and the fact that ExP-segments implicated in event structure are members of $\{\text{Ex}[V]\}$ and thereby render their C-core, whether complex or a mere root, $V$-equivalent. If, then, binyanim are instances of $C_{V[V]}$, we expect them to come in two possible instantiations. One of these corresponds, broadly speaking, to that of R-nominals, where atomic Content is possible, and where an embedded constituent may or may not be, on its own, an independently attested V. We further expect them, however, to have the distribution of AS-nominals, insofar as we expect configurations in which event structure may occur dominating some internal embedded constituent, and with the latter, in turn, rendered $V$-equivalent through the presence of event structure ExP-segments. In short, we expect the structural possibilities in (38)–(39). In (38) a binyan is derived directly from a ($V$-equivalent) root. In (39), on the other hand, a binyan is derived from another binyan (Content domains boxed,
adjunction structures not represented; root Content domain not marked in (39a–b); ExS=ExP-segment):\(^{30}\)

\(38\)

<table>
<thead>
<tr>
<th></th>
<th>[ EP [ ExS [ CV[V]1 ] ]</th>
</tr>
</thead>
<tbody>
<tr>
<td>a.</td>
<td>[ EP [ ExS [ CV[V]1 ] ]</td>
</tr>
<tr>
<td>b.</td>
<td>[ EP [ ExS [ CV[V]1 ] ]</td>
</tr>
<tr>
<td>c.</td>
<td>[ EP [ ExS [ CV[V]1 ] ]</td>
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</tbody>
</table>

\(39\)

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<th></th>
<th>[ EP [ ExS [ CV[V]1 ] ]</th>
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<tbody>
<tr>
<td>a.</td>
<td>[ EP [ ExS [ CV[V]1 ] ]</td>
</tr>
<tr>
<td>b.</td>
<td>[ EP [ ExS [ CV[V]1 ] ]</td>
</tr>
<tr>
<td>c.</td>
<td>[ EP [ ExS [ CV[V]1 ] ]</td>
</tr>
</tbody>
</table>

In all cases in (38)–(39), we have a verbal(ized) constituent embedded inside a binyan. Event structure, however, differentiates these cases. In (38a, b) as well as in (39a, b), the only event complex available is that which dominates, exclusively, \(CV[V]\). Taking a page yet again from derived nominals, we could consider such cases rather equivalent to the English R-nominal \textit{transformation}. As an R-nominal, \textit{transformation} is ambiguous. It could be compositional, with Content matched with \textit{transformation}. It could also however, be atomic, with Content matched with \textit{transformation} as a whole. Either way, no event structure would be associated with the internal instantiation of \(V\). Similarly, in (38a) as well as in (39a) Content may be assigned to the most embedded verbal(ized) constituent, with compositionality resulting. Content, however, can also be matched with the C-core in its entirety, as in (38b) and (39b), with event structure, yet again, dominating the C-core in its entirety. Under any of these derivations, note, no event properties could be associated with either \(CV[V]\) in (38a, b), or with the verbalized root in (38a, b) as such.

Not so, however, the structures in (38c) and (39c), where distinct event structure arrays dominate \(CV[V]\) and the internal verbal domain, be it \(CV[V]\) or a \(V\)-equivalent root. The structures in (39c), then, give us a bi-eventive structure, in which the embedded C-core domain perforce is assigned (independent) Content, and perforce must be otherwise independently attested (or else doomed to be permanently Contentless: see Chapter 9, section 3.4). We note further that insofar as the representations in (39c) only contain a single root, all structure above the root consists of functors, a configuration that we expect to give rise to semantically and syntactically computable configurations and with predictable, rigid designations emerging.

That there are, indeed, formal derivational relationships between binyanim appears almost inevitable, although a formulation of such relationships has always been a difficult matter given the fact that the system as a whole is ridden with non-compositionality, an effect which the derivations in (38)–(39) actually predict. The strongest case for such a derivational relationship is that which holds between III and VII. While exceptions certainly exist, it is nonetheless the case that most instantiations of VII do have a correlate in III, and that while Content-relatedness

\(^{30}\) We do not exclude, note, the logical possibility of three or even more binyanim embedded within each other.
is not always straightforward, a sufficient number of systematic Content correlations does occur to make a derivational compositional relation extremely appealing; all the more so as VII is syntactically much more stable than III (always being intransitive), and with few exceptions it is either a reflexive/reciprocal, inchoative, or middle. Morpho-phonological evidence for deriving VII from III is even more compelling. Both binyanim have a geminated middle radical, and both have an identical realization for weak roots (see fn. 4). Both, furthermore, utilize the same strategy to accommodate bi-radical roots, allowing their reduplication as in (40):

(40) III  
  \[ \text{gilgel} \quad \text{bilbel} \quad \text{šipšep} \quad \text{šilšel} \quad \text{?ir?er} \] 

  \[ \text{roll.TRANS} \quad \text{confuse.TRANS} \quad \text{rub.TRANS} \quad \text{lower.TRANS} \quad \text{destabilize.TRANS} \]

  VII  
  \[ \text{hitgalgel} \quad \text{hitbalbel} \quad \text{hištapšep} \quad \text{hištalšel} \quad \text{hit?ar?er} \] 

  \[ \text{roll.INTRANS} \quad \text{be.confused} \quad \text{rub.self} \quad \text{lower.INTRANS} \quad \text{destabilize.INTRANS} \]

Even more interestingly, note that VII, but no other binyan, shows no vocalic differences between its perfective and imperfective forms (see the table in (5)), both identical to the imperfective vocalic realization of III. Recall that the only other case of identity between the perfective and the imperfective stem was that of P-\(Vc\) where, I argued, P-\(Vc\) marking pre-empts the relationship between the binyan (III or V) and the S-marking associated with T. In turn the uniform instantiation of VII would follow directly if we assume not only that VII is derived from III, but that it derives, specifically, from the imperfective instantiation of III. Alternatively, and under the assumption that “imperfective” as such is an event node, but the relationship between III and VII does not always involve two events, the effect could follow if we assume that some vocalic melody must be associated with III prior to the merger of VII, and that the imperfective melody is the default one. As an added bonus, note, we get the fact that the \(C_{N[V]}\) instantiation of VII was the only one in which the vocalic melody was identical to that attested with the verb (cf. fn. 20) If, as we now suggest, VII does not have independent choice but inherits its vocalic melody from III, we do not expect the choice of \(C_{N[V]}\) to allow any changes in that configuration.\(^{31}\)

\(^{31}\) If on the right track, we note, and given the fact that II, III, and V all have distinct perfective and imperfective instantiations as well as distinct \(C_{N[V]}\) vocalization, it would suggest that for whatever reason, II, III, and V may never merge with another binyan, and that when they are instances of \(C_{N[V]}\), may only merge with Qal, where, by assumption, there is no derivational realization class and hence no default vocalization would emerge when a binyan merges with it. We note, without pursuing the matter, that the conclusion is independently plausible. Embedding either III or V under II, or II and III under V are independently morpho-phonologically and compositionally implausible. While strong correlations do exist internal to these forms, they are, almost across the board, between Qal and II, on the one hand (active–passive; transitive–inchoative), and Qal and V (with V typically adding a causer) on the other.

The claim that the default form in Semitic is the imperfective stem and that all verbal forms are derived from it, rather than from the root, is at the heart of the claim otherwise made by Sibawayh and the 8th century Basra school of Arabic grammar (cf. Owens, 1988). Equally important for that claim is the view that the imperfective stem is nominal. For modern arguments to the same effect, see especially Benmamoun (1999). We note, among other factors, the significant prima facie problem that emerges for such a general account when we consider the asymmetry between VII and the other binyanim. If it is indeed correct that VII is derived from the imperfective form of III, then \textit{ipso facto}, the absence of such stable phonological effects in all other cases, even binyan-internally, suggests that they are \textbf{not} derived from the imperfective stem. In other words, an across-the-board derivation from the imperfective stem for all binyanim would
Under the assumption that the derivation of VII from III is plausible, we now note that all three structures in (39a–c) should, in principle, be available. One of them, (39a), would give us a single event structure, but some Content compositionality nonetheless. The next, (39b), would give us a single event structure and atomic Content, but would retain whatever C-function any semantic function $C_V[V\text{-}VII]$ might have. Finally, (39c) should give us a fully articulated complex bi-event structure, in which VII and whatever event structure may be dominating it would have in its scope another event complex, dominating III and impacting it in predictable, semantically and syntactically computable ways. Suppose now that the rigid designation of $C_V[V\text{-}VII]$ involves intransitivity, however otherwise characterized, and possibly related to its semantic function, call it SE, more or less akin to the semantic function of Romance se (but not necessarily to its pronominal syntactic function), and hence compatible with reflexive, reciprocal, inchoative, and middle. From this perspective, consider the VII cases in (42), by assumption derived from the III instances in (41):32

(41) a. Ran qippel 'et ha.xulca.
   Ran folded om the.shirt

b. ‘Liberman qippel ‘et Netanyahu.
   Liberman folded om Netanyahu
   ‘Liberman caused Netanyahu to give in.’

(42) a. ha.xulca hitqappla be-qalut.
   the.shirt folded easily

b. Netanyahu hitqappel ve-‘az nissa šuv. (G)
   (lit.) folded.INTRANS

Netanyahu gave in and then tried again

Insofar as (42b) is clearly not compositional, and insofar as the specific non-compositionality here is not attested with III and hence could not have been inherited from it, this is a clear instantiation of the structure in (39b). We now note that determining whether the compositional (42a) is a case of (39c), in which case the embedded III verbal form qippel ‘fold.TRANS’ is dominated by its own event complex, or a case of (39a), in which compositionality may exist, but no two complex events, is not a simple matter. Once again borrowing a chapter from the history of research on English derived nominals, we note that the assumption that derived nominals display massive optionality relative to both arguments and event properties was, and continues to be, quite influential, and that establishing a principled

 deprive us of an account for the special properties of VII, which were, in the present context, the sole reason to favor such a derivational route to begin with.

32 The brief comments here should not be construed as a full analysis of VII, nor do they suggest that VII is syntactically identical to se, although, of course, in line with the general approach under development here, the properties of VII would have to be instantiated through the syntax, and not through some lexical operation on argument structure. Romance se, rather, is used here as a useful mnemonic for describing what I take to be a semantic of VII, otherwise a C-functor. For much discussion of VII and a comparison with Romance se, see Reinhart and Siloni (1994). For arguments against the lexical analysis propounded in Reinhart and Siloni (1994) see especially Alexiadou and Doron (2012).
distinction between AS-nominals and R-nominals required the development of a complex and fine-grained set of diagnostics. Pointing the way towards possible future research, then, we note that if both structures in (39c) and (39a) are possible, fine-grained diagnostics would need to be developed in order to determine whether e.g. (42a) is an instance of (39a), an instance of (39c), or quite possibly, is ambiguous in ways that can be shown and argued for consistently. Such diagnostics would need to take into account not only the correlation between (41a) and (42a), but also the correlations in (43), where instances of VII may be inchoative, middle, or reflexive, and depending on contextual considerations (and with a bit of coercion), all three; but presumably not the cases in (44), or, for that matter, cases in which there is no III existing form at all, as in (45):

(43)  

<table>
<thead>
<tr>
<th></th>
<th>III</th>
<th>VII</th>
<th>III</th>
<th>VII</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>sereq</td>
<td>histareq</td>
<td>sikken</td>
<td>histakken</td>
</tr>
<tr>
<td>comb</td>
<td>comb.self; comb.middle</td>
<td>risk.TRANS</td>
<td>take.risk</td>
<td></td>
</tr>
<tr>
<td>qīṣḥet</td>
<td>decorate</td>
<td>hitqaṣḥet</td>
<td>xibber</td>
<td>hitxabber</td>
</tr>
<tr>
<td>decorate</td>
<td>decorate.self</td>
<td>become.decorated</td>
<td>connect.TRANS</td>
<td>connect.INCHOATIVE; connect.self</td>
</tr>
<tr>
<td>pereq</td>
<td>hitpareq</td>
<td>become.apart</td>
<td>riggeš</td>
<td>hitraggeš</td>
</tr>
<tr>
<td>take.apart</td>
<td>(Internal Causer; Patient)</td>
<td>excite.TRANS</td>
<td>become.excited</td>
<td></td>
</tr>
</tbody>
</table>

(44)  

<table>
<thead>
<tr>
<th></th>
<th>III</th>
<th>VII</th>
<th>III</th>
<th>VII</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>ṣereb</td>
<td>hitṣereb</td>
<td>ṣeqqat</td>
<td>hitṣeqqat</td>
</tr>
<tr>
<td>mix</td>
<td>bet</td>
<td>command</td>
<td>be.counted</td>
<td></td>
</tr>
<tr>
<td>‘exer</td>
<td>be.late</td>
<td>be.late</td>
<td>xiṣše</td>
<td>beCalculator</td>
</tr>
</tbody>
</table>

When we turn now to the structures in (38), two questions must be asked. First, whether it is plausible to assume that they exist. In this respect, we note, the answer cannot be based on the cases in (38b), where by assumption the derivational history is obscured. Rather, we must ask whether a verbalized root, in a structure such as (38), can correspond to a Content domain, on the one hand, and whether it can be embedded under event structure, on the other. Providing the answer is affirmative, we must ask a narrower question—can the structure in (38) correspond to VII as well? Specifically, can VII be formed not only by merging with III, but by merging with a root, therefore categorizing it? We note that yet again the question cannot be meaningfully answered relative to (38b), quite simply because there would be little to
distinguish VII forms with the structure in (38b) from forms that have no verbal source whatsoever.

That specifically the structure in (38c) must be allowed to exist follows directly from the work of Doron (2003). Doron observes that in the context of attested Qal instantiation of a root, a III-binyan with the same root and with Content overlap entails an Agent, while a V-binyan instantiation of the same root, if available and with Content overlap, would only entail a Causer. In (46a), for instance, and although the Qal instantiation is transitive, the creation of the antibodies may have been in reaction to the passive presence of the protein in the blood, but not so in (46b) where the protein is the direct catalyst of the production of antibodies. In (47a, 48a), in yet another illustration, the field must be construed as growing thorns intentionally (and hence the anomaly), but not so in (47b, 48b) where the field can be construed as an inadvertent Causer. Note that while (48b) is licit with a human subject, the favored interpretation is of involuntary beard growth:

(46) a. ha.xelbon yacar (Qal) nogdanim b-a.dam
   the.protein created antibodies in-the.blood
b. ha.xelbon yiccer (III) nogdanim b-a.dam
   the.protein produced antibodies in-the.blood

(47) a. ha.qocim camxu (Qal) b-a.sade
    the.thorns grew.INTRANS in-the.field
b. ha.zaqan šelo camax (Qal) maher
    the.beard his grew.INTRANS fast

(48) a. Ran cimme'ax (III) zaqan #ha.sade cimme'ax qocim
    Ran grew beard the.field grew thorns
   (intentionally)
b. #Ran hicmiax (V) zaqan ha.sada hicmiax qocim
    Ran grew beard the.field grew thorns
   (intentionally)

As has been frequently observed, one of the drawbacks to the system developed in Doron (2003) (and see also Alexiadou and Doron 2012) involves the fact that the effects noted, while solid enough, nonetheless seem to be attested only when the same root actually occurs in more than one binyan. Only in such cases, specifically, can a systematic relationship be observed such that it can be directly assumed that some semantic value associated with e.g. III operates on some argument complex otherwise associated with Qal in a rigidly designating fashion. On its own and without such a derivational correlation, III does tend to correspond (broadly speaking) to activity and always has an external argument (i.e. it is never unaccusative). Nonetheless, it does fall short of entailing an Agent in many of its occurrences. But if we now consider again the structures in (38) and (39), we find that this is exactly what we

33 E.g., among others:

(i) cippa gera kibbed ziha qibbel
   await excite respect recognize receive (as in ’this picture excites me’)

(cont.)
predict. Insofar as the semantic operation proposed by Doron is an operation on an embedded event structure, it would only be compatible with the structures in (38c) and (39c). Insofar as being embedded under event structure-inducing ExP-segments forces the lower verbal instantiation to have independent Content and to be realizable, it follows that the effects documented by Doron (2003) directly entail the existence of a pair (at the very least). Without an embedded event structure, it quite simply couldn’t occur, but in the presence of an embedded event structure, a separate independent verbal instantiation is directly forced.34

Having concluded that there is at least some evidence for the structures in (38) in general and for (38c) in particular, we must pose our next question: namely, can the structures in (38) spell out as any binyan at all, or are there additional restrictions which guide the distribution of binyanim so as to force, for instance, VII to be derived from III or not at all, or to be derived from III in cases that have embedded events but not in others, and so on? By way of offering a preliminary answer to this question, we note that insofar as VII can occur without a source in III altogether, as in (44b), the structure in (38b) cannot be directly excluded for VII. All the more so as VII does occur alongside Qal forms (and with no correlating III forms) in contexts where there is Content overlap which, at least at times, is systematic:

(49) a. hizda?ep hitparec hitgabber hitraxec katab makar
become.angry erupt overcome wash.self write sell

b. za?ap parac gabar raxac hitkatteb hitmakker
be.angry erupt, prevail wash correspond become addicted
break in

This said, it remains the case that while non-compositional (or partially compositional) pairs are relatively common, fully predictable pairs of Qal-VII, such as hitraxec ‘wash.self’ (VII) and raxac ‘wash’ (Qal) are rare and represent the exception rather than the rule. They thus raise the possibility that while the structures in (38a, b) are possible for VII, the structure in (38c) may not be. Specifically, and if correct, VII is necessarily a realization of a C_V[V], which merges with C_v otherwise realized as III. I leave this matter aside at this point, hoping, as regarding other matters discussed in this section, that future research may allow us to develop diagnostics that would bear on the formal determination of these matters.

11.5.3 Other types of Complement Space

Before concluding this chapter, it is worthwhile considering, albeit very briefly, the possibility that the structures in (50)–(51) may exist alongside those in (38)–(39) (and note that (38c) and (39c) would, of course, be excluded as the event structure-related ExP-segments merging with the root would be verbalizing it, thereby excluding any N-equivalent instantiation):

34 We leave to future research the specific detailed characterization of the semantic function of III so as to allow it to be instantiated without an embedded event structure. See Doron (2003) for a fuller semantic discussion.
In (50), the C-functor $C_{V[N]}$ would be rendering the root N-equivalent. Content may be compositional, as based on the Content of some instance of an N-equivalent constituent which exhaustively contains the root, or, alternatively, Content would be non-compositional, as based on the combination of $C_{V[N]}$ and the (N-equivalent) root. In (51), on the other hand, and mimicking the cases in which, I suggested, a binyan may be embedded under a binyan, what would be embedded under a binyan, what would be embedded under $C_{V[N]}$ would be a mishqal, an instance of $C_N$ together with some complement, however categorized. Importantly, and if the structures in (50)–(51) turn out to be possible, we must also ask whether the examples of $C_{V[N]}$ under consideration are the very same as our binyanim (in which case some or possibly all binyanim would be instances of $C_{V[N/V]}$).

The matter is a tricky one, and I will be setting it aside in the hope that future research may shed light on it. It is of some value, however, to outline what might be at stake, much as a preliminary perusal of the evidence seems to point in conflicting directions.

The first task for any attempt to answer the question concerning the existence, or absence thereof, of the structures in (50)–(51) would be the identification of what, in Hebrew, would be a mono-morphemic contextually nominalized root, equivalent to the Qal within the nominal domain. At least one candidate would be vocalized acronyms, argued by Bat El (1994b) to represent a (nominalized) default vocalization of a consonantal tier. Acronyms, in turn, although always either tri-radical or quadro-radical, make for unusually ill-formed verbs in a linguistic system that otherwise freely borrows and integrates consonants into the verbal system extremely productively. At least one account for such surprising infelicity would be the fact that having been nominalized, they cannot merge with the binyan functors, by assumption cases of $C_{V[V]}$:

Another candidate for such mono-morphemic nominalized roots would be the large class of "segolite" nouns, tri-consonantal nominal forms present already in Proto-Semitic, and marked by a short, stressed syllable and, historically, a coda with a consonant cluster, subsequently giving rise in some Semitic languages to a penultimate stress in a bi-syllabic structure through an epenthetic vowel. An impediment to
postulating segolites across the board as nominalized mono-morphemic roots, however, is the fact that some of them are clearly de-verbal nominals (i.e. the BH form derived nominals discussed in Chapter 5 as well as in section 11.2.2 above), while others (mostly of the o-e pattern) are clearly de-adjectival nominals, at least some of which occur with a considerable degree of predictability and productivity:

(53) ‘adom yaroq cahob šaxor qaše šamen gadol qatan
red green yellow black hard fat big small
‘ődem yöreq cóhab šóxar qóši šómen gódel qóṭen
redness greenness yellowness blackness hardship fatness bigness smallness

Matters are not helped by the fact that insofar as there are segolites which are (plausibly) neither de-verbal nor de-adjectival, they rarely if ever appear to give rise to a Content-related binyan derivative, and as such prove a less than reliable highway for the formation of our putative C_{VN} binyanim. In the table in (54), a sample of segolite forms are correlated with both Qal and binyan occurrences of root sharing, with common Content as well as with distinct Content. The correlations, as is easy to ascertain, are less than overwhelming:

<table>
<thead>
<tr>
<th>Segolites</th>
<th>Qal, Content-related</th>
<th>V, Content-related</th>
<th>III, Content-related</th>
<th>V, shared root, distinct Content</th>
<th>III, shared root, distinct Content</th>
</tr>
</thead>
<tbody>
<tr>
<td>lèxem</td>
<td>bread</td>
<td></td>
<td></td>
<td>hílxim weld</td>
<td></td>
</tr>
<tr>
<td>kéléb</td>
<td>dog</td>
<td></td>
<td></td>
<td>hiklib stitch</td>
<td></td>
</tr>
<tr>
<td>sèkel</td>
<td>brains</td>
<td>hískil</td>
<td>smarten up</td>
<td></td>
<td></td>
</tr>
<tr>
<td>pèrax</td>
<td>flower</td>
<td>hípriax</td>
<td>make.bloom</td>
<td></td>
<td></td>
</tr>
<tr>
<td>véred</td>
<td>rose</td>
<td></td>
<td></td>
<td>hívrid</td>
<td>become.pink</td>
</tr>
<tr>
<td>kétér</td>
<td>crown</td>
<td>híktir</td>
<td>crown</td>
<td>kitter</td>
<td>surround</td>
</tr>
<tr>
<td>népeš</td>
<td>soul</td>
<td></td>
<td></td>
<td></td>
<td>šimmeš</td>
</tr>
<tr>
<td>šemeš</td>
<td>sun</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>gereb</td>
<td>sock</td>
<td>garab</td>
<td>don.socks</td>
<td></td>
<td></td>
</tr>
<tr>
<td>qóbaʔ</td>
<td>hat</td>
<td></td>
<td></td>
<td>qibbeaʔ</td>
<td>fix</td>
</tr>
<tr>
<td>dérek</td>
<td>way</td>
<td>darak</td>
<td>step</td>
<td></td>
<td>hidrik</td>
</tr>
</tbody>
</table>
The absence of an obvious source for a nominal realization under a binyan notwithstanding, it is clear that at least at times, we must allow for the embedding of some nouns, and specifically some instances of ṣiqal under some binyanim. Some relevant cases were already discussed in section 2.2 of Chapter 9, based on paradigms first noted and analyzed in Bat El (1986, 1989) and then discussed in Arad (2003, 2005). Recall that such cases, and contrary to Arad’s claim, may be both compositional and non-compositional (and some relevant cases are reproduced in (55)–(56)); and as such, support the existence of the structure in (51) with its two distinct Content domains. Interestingly enough, note, (56c) may involve a triple embedding, i.e. as in (57), and with a larger Content domain, yet spanning not only an N embedded under V, but the embedding of this combined N+V constituent under yet another V, with atomic Content nonetheless emerging:

(55) a. miSXaR  miSGeRet  maXŠeB  [mišqalim:  miRRaR; maRReR]  
      commerce  frame  computer  
 b. MiSXeR  MiSGeR  MiXŠeB  III
      commercialized  framed  computerized

(56) a. XeRBoN  ŠiRYon  maNoP  [mišqalim:  ReRRon; maRReR]  
      failure, mess  armor  crane  
 b. XiRBeN  ŠiRYeN  MiNNeP  III
      defecate  secure privilege  leverage, advance
 c. hitXaRBeN  VII
      menstruate

(57) a. \[
\begin{array}{c}
[ C_{V[n]} ]_1 \\
[ C_{V[n]} ]_2 \\
[ N C_{N[p]} ] \\
[ C=? \sqrt{\Delta XRB} ]
\end{array}
\] 
  VII  III  ReRRon
 b. /hitxarben/ → MENSTRUATE

Finally, the conclusion that at least at times binyanim must be allowed to be instances of \(C_{V[a]}\) emerges strongly relative to binyan V, which is particularly amenable to the incorporation of both adjectival and nominal constituents, some clearly instances of a miṣqal, and where the emerging interpretation is extremely
regular suggesting the structure in (51b) and quite possibly even the existence of some
nominal or adjectival ExP-segments intervening between the mišqal and V (and see
Borer 1991 for some discussion, albeit within a different approach to complex words).
Some examples are in (58):

(58) a. hizhib hikxil hivrid hiksif hiqṭin he'erik
    MAKE/BECOME (more) golden blue pink silvery small long

b. zahab kaxol varod kesep qaṭan ‘AROK
    gold blue pink silver small long

I set all these matters aside now, in the hope that the particular theoretical
perspective advanced in this work will prove instrumental in resolving them, and
that the few results and questions posed in this chapter will serve as a foundation for
continuing inquiry.
12

Synthetic Compounds

12.1 Introduction

Derived nominals, analyzed in great detail in the first chapters of this book, have remained throughout the core case on which various aspects of the proposed model have been illustrated. Puzzles coming from derived nominals informed the proposals on the nature of C-functors and constraints on their distribution, on the nature of derivational relationships, on the mapping to phonological realizations (or spellout) and on the nature of Content matching. It is thus only appropriate that in the final chapter we revisit derived nominals, this time from the perspective of Synthetic Compounds, and investigate the way in which these shed light not only on the structure of both AS-nominals and R-nominals, but also on other aspects of the model that has been developed here.

Recall now that Part I of this book provides evidence for the distinct derivational histories of AS-nominals and R-nominals. Specifically, in R-nominals the verb incorporated directly into $C_N[v]$. In AS-nominals, on the other hand, the verb re-merged repeatedly as the head within the domain of the Extended Projection, only then proceeding to merge with $C_N[v]$. The matter was taken up again, recall, in Chapter 9. There, I proposed that an important additional difference between AS-nominals and R-nominals involves the existence within the former but not within the latter of an absolute phase boundary for Content matching, associated, specifically, with the first merging ExP-segment within the domain of the event. The result was the forced Content compositionality of AS-nominals, but not of R-nominals. The specific structures proposed for R-nominals and for (Long, active) AS-nominals were thus as in (1)–(2) (nominal ExP-segments and arguments omitted):

(1) **R-nominals:**

\[
\begin{array}{c}
\text{C}_N[v] \\
\text{C} = V \\
\text{[C} = V_{,...,} ] \\
\end{array}
\]

\[
\begin{array}{c}
\text{C} = V \\
\text{[C} = V_{,...,} ] \\
\end{array}
\]
The label C=V, in turn, stands either for a root rendered V-equivalent in the context of the functors that dominate it (C_{N[v]} for R-nominals; verbal ExP-segments for AS-nominals) or for an already verbalized constituent such as naturalize or patronize, the latter with their own derivational history and potentially compositional or non-compositional Content.

In view of these structures, consider now the configuration typically labeled Synthetic Compounds (Syn-Compounds) as in (3a) and possibly (according to some accounts) (3b) as well:

(3)  
   a. truck driving; paper writing; wall fixing; cat grooming  
   b. truck driver; paper writer; wall fixer; cat groomer  
   c. document transmission; facilities maintenance

At first blush, the Syn-Compounds in (3a–c) seem little different from the AS-nominals in (4), especially if one were to consider the of-complements in (4c) as arguments of some verbal projection on a par with AS-nominals, at least prima facie a plausible assumption:

(4)  
   a. the driving of the truck (by Mary); the grooming of the cats (by John)  
   b. Mary’s driving of the truck; John’s grooming of the cats  
   c. the driver of the truck; the fixer of the wall; the groomer of the cat  
   d. the transmission of the documents (by Mary); the maintenance of the facilities (by John)  
   e. Mary’s transmission of the documents; John’s maintenance of the facilities

In view of the great apparent similarity between AS-nominals and Syn-Compounds, the natural question to ask is whether the constructions are indeed related. Such relatedness could, in principle, manifest itself in two ways. First, it is possible that the Syn-Compounds in (3) are directly (morphologically) derived from the nominals in (4). A second option for relatedness would derive both AS-nominals and Syn-Compounds from an identical source structure, but not necessarily from each other.

Importantly, either one of these notions of relatedness can be expressed, at least prima facie, either lexically or syntactically. Thus traditionally, both AS-nominals and Syn-Compounds are handled lexically. Both involve word formation operations, typically assumed to be non-syntactic, and both avail themselves of lexically privileged information such as argument selection (particularly internal argument)
potentially listed with the source verb. Within such a lexical approach, then, it must be asked whether Syn-Compounds are (lexically or syntactically) derived from the lexically derived AS-nominal, or whether alternatively, each is lexically derived independently from an identical verbal source listed with its arguments. (For a lexicalist analysis of Syn-Compounds, see Selkirk 1982; Di Sciullo and Williams 1987; Lieber 2004, 2009; Ackema and Neeleman 2004.)

Within the syntactic approach to AS-nominals outlined in this work, these two questions can be equally clearly formulated. Thus we must ask whether the Syn-Compounds in (3) are directly derived from the nominals in (4), e.g. by incorporating the object into the head N as based on the structure in (2), or possibly its passive, Short variant, discussed in Chapter 5. A second syntactic option would derive both AS-nominals and Syn-Compounds from an identical source structure, but not necessarily from each other. For instance, I argued at some length in Chapters 2–5 that AS-nominals crucially involve an embedded event structure, as in the structure in (2). An attempt to link the AS-nominals in (4) with the Syn-Compounds in (3) could then involve the assumption that the same event complex, e.g. as in (2), underlies both, but that in Syn-Compounds, the object incorporates into the V prior to the incorporation of the latter into N.

Attractive as such analyses might seem, however, I will nonetheless argue that they cannot be maintained, and that Syn-Compounds are not cases of AS-nominals at all, but rather cases of R-nominals, and that as such they have no access to any arguments that may otherwise be associated with the verb (in lexicalist approaches) or with the event complex. The detailed comparison will not only help to shed light on the workings of the system that has been developed here, but will also provide extremely strong support for integrating word-internal structure into the syntax. As we shall see, the distinctions that will be outlined in the next few sections simply cannot be captured within any lexicalist framework and require, crucially, a view of word-internal structure as syntactically constructed and as syntactically visible.

12.2 Syn-Compounds

12.2.1 Preliminaries and the First Sister Principle

By way of providing a description of the constructions which typically come under the title Syn-Compounds, consider the following quote, from Spencer (2005, pp. 88–9):

(i) a. man driven; secretary written; moth eaten
   b. quick-fried; slow-roasted
   c. *cake baked; *letter written; *church gone

1 ER Syn-Compounds are noted in the discussion below, but our main concern remains a comparison between ING Syn-Compounds and AS-ING nominals. Among other reasons, a full analysis of analytic ER nominals is outside the scope of this book, especially since they do present challenges which distinguish them from AS-nominals. For some important comments on ER see, however, sections 12.5 and 12.7.

Another type of construction often labeled Synthetic Compound is that in (ia, b), involving the “external” argument together with a passive participle. The FSP derives such (passive) compounds by incorporating the passivized subject into the verb, under a subject-demotion analysis of passive. The ungrammaticality of (ic), in turn, follows from the assumption that the object is promoted and hence is no longer a sister of the verb:
A number of researchers have followed Marchand (1969) and others in distinguishing two types of noun–noun compound in English: root compounds such as *coffee table* and verbal nexus compounds, or synthetic compounds, in which the lexical head is derived from a verb... The point about these constructions is that the non-head of the compound seems to bear a syntactic dependency to the head, realizing its direct object or some other grammatical function... There is thus a prima facie case for the involvement of syntax at some level of representation and, indeed, synthetic compounds bear some resemblance to noun incorporation structures which some take to be a classic case of syntactic word formation (e.g. Baker 1988). [Emphasis mine, HB]

A particularly influential syntactic treatment of Syn-Compounds is that of Roeper and Siegel (1978), who analyze such compounds as involving the incorporation of a constituent into the verb, providing it is its first sister:

(5) First Sister Principle (FSP) (Roeper and Siegel 1978):
    All verbal compounds are formed by the incorporation of a word in first-sister position of the verb.

The FSP seeks to capture the fact that the non-head in Syn-Compounds, as described above, is typically understood to refer to an internal argument or alternatively to an adjunct, but not to an external argument:

(6) a. truck driving; letter writing; bread eating
    b. truck driver; letter writer; bread eater

(7) a. fast acting; slow growing; quick drying
    b. pan frying; step dancing; church going (fry (in) pan; dance (in) steps; go (to) church)

(8) a. *chef making (of cakes); *man driving (of trucks)
    b. *chef maker (of cakes); *man driver (of trucks)

Note that such compounds do not fall within Spencer’s (2005) specific description insofar as they are not N–N compounds, but rather N–A or N–Ptc compounds. Some references will be made throughout the text discussion to such compounds. A complete discussion is not attempted, however. The reason is that the main focus of this chapter is a comparative study of Syn-Compounds and AS-nominals, and other Syn-Compounds are only touched upon as their understanding, I will claim, is crucial to the understanding of ING Syn-Compounds. The expressions in (i), on the other hand, are not nominal but altogether adjectival, and while many of the claims made here concerning Syn-Compounds are, in principle, applicable to them, a complete analysis is outside the scope of this study. Similar considerations apply to the adjectival Syn-Compounds with the active participle in (ii):

(ii) crop-growing farmer; letter-writing clerk; black-printing printer

For some general comments on the differences between adjectival ING and nominalizing ING, see section 5 of Chapter 7.

As Spencer notes, accounts differ as to whether they consider ATK-based compounds such as (3c) to be Syn-Compounds (in some unified structural sense) (see most recently McIntyre 2009). For that matter, e.g. Roeper and van Hout 2009 consider combinations such as water availability to be Syn-Compounds as well, insofar as they, too, involve object incorporation in their account.

In what follows I will suggest that at the very least N–N Syn-Compounds do not involve the realization of an argument, and that whatever residue of properties distinguishes them from so-called Root Compounds is solely due to the properties of the relevant suffixes. Insofar as this is the central claim, all N–N compounds are in actuality “root” compounds. As will become further clear in section 12.5, whatever remains of the diagnostics of Syn-Compounds does not, in fact, hold for compounds headed by ATK suffixes, making them, in whatever meaningful residual sense might apply, not instances of Syn-Compounds.
A few comments are in order about the technical aspects of the FSP before we proceed. First, we note, FSP presupposes, in accordance with its period, a rather
different model of both the syntax and the lexicon. The lexicon assumed is in essence
that of Chomsky (1965, 1970), in which argumental roles or thematic roles are not
specified in verbal entries. Rather, verbal entries come with a subcategorization
frame. Syntactically, phrase structure need not be binary branching, and more
specifically, all constituents that follow the verb within the VP, including, e.g., quickly
in fry quickly are sisters of V (hence the specification of first sister, which, within a
binary branching system, is a tautology). As a consequence, in a phrase such as fry the
pasta quickly, both pasta and quickly may be sisters of V. Finally, the FSP does not
assume the Unaccusativity Hypothesis, and in all likelihood predates its earliest
formulations (cf. Perlmutter 1978). As a consequence, subjects of unaccusatives are
not assumed to be sisters of the verb, but rather bona fide subjects. In turn, the
ungrammaticality of (9a) follows directly from the assumption that e.g. tree is never
a sister of V, and as such, patterns with the ungrammaticality of (9b):

(9)  a. *tree falling; *train arriving; *volcano erupting
    b. *boy laughing; *elf dancing; *slave laboring

Any attempt to reformulate the FSP in present-day theoretical terms faces serious
foundational (rather than mere executional) problems. For instance, an attempt to
subsume the FSP under an incorporation account along the lines of Baker (1988) and
subsequent work would not, in fact, yield the correct results given the fact that many
of the non-heads are not direct complements of the verb (e.g. church going), and
some are altogether adjuncts and not complements (pan frying). Most crucially,
however, the FSP is squarely incompatible with the Unaccusativity Hypothesis.
According to the latter, tree, in (9), merges in the very same position relative to e.g.
fall, as pasta does relative to fry, by assumption First Sister. The FSP in conjunction
with the Unaccusativity Hypothesis thus predict the existence of Syn-Compounds
consisting of verbs and their sole internal complement. And yet these are systematically
excluded, as (9a) shows. As we shall see, this problem consistently plagues any
subsequent account which seeks to appeal to the intuition expressed by the FSP.

The empirical adequacy of the FSP has come under some criticism in the literature
(and see in particular Bauer 1983 for a fuller review). Of particular interest, from our
perspective, are the cases in (10)–(12), which Roeper and Siegel (1978) as well as
Selkirk (1982) explicitly claim are excluded, but which are actually entirely licit. Note
in this respect that while merging the object outside the adjunct, as in (12), may not
always be fully licit, merging the adjunct outside the object is considerably worse:

(1) a. *tree eating of pasta
    b. ?tree top pruning of branches
    c. ?mid-ocean sinking of ships

---

2 (ia), from Selkirk (1982), is, indeed, odd, if tree is construed as a location, although improvement is
perceived for the location expressions in (ib, c). The temporal expressions in (10) as well as the adjuncts in
(11) are, however, fully licit. I have no account for these contrasts:

(i) a. *tree eating of pasta
    b. ?tree top pruning of branches
    c. ?mid-ocean sinking of ships
Going beyond these empirical issues, however, suppose we turn to a closer investigation of whether the core generalization expressed by the FSP is theoretically on the right track altogether, and whether any formal system can be constructed so as to capture it. Specifically, let us pose the question in (13) relative to the claim in (13i):

(13) **Could it be maintained that:**

i. There exist N+N compounds, call them “Syn-Compounds”, in which the head contains a verbal nexus and the non-head exhibits (syntactic or lexical) argumental dependency on it.

The argumental dependency under consideration here is deliberately vaguely stated in (13i), precisely because of an attempt not to bias the issue ahead of time. (13i), we note, can be coherently stated both syntactically and lexically. It could further be a statement about a relationship which holds between the non-head and a root; between the non-head and a verb; or between the non-head and a derived nominal; again an open issue. What I hope to show is not that one or another execution of (13i) is untenable, but rather, that in principle, there could not be any explanatory adequate executions of (13i). In short, that the answer to the question in (13) is a resounding **No!** and that such a negative answer holds under any possible formulation of the relevant dependency.

More specifically, I will now embark upon considering some actual and hypothetical accounts of Syn-Compounds which adhere to some version of (13i). As I will illustrate, they lead, inevitably, to theoretical contradictions as well as to massive empirical and theoretical inadequacies, which, at the end of the day, strongly militate against maintaining any version of the claim in (13i).

12.2.2 **On the absence of event structure in Syn-Compounds**

Before turning to an investigation of (13i), we should highlight a rather striking difference between Syn-Compounds and AS-nominals: the fact that the former, in contrast with the latter, do not have grammatical event properties (also noted in van Hout and Roeper 1998). Thus consider the contrast between (14) and (15):

\(\text{(14)}\)

\(\text{(15)}\)

3 Note that at least at times, event modification appears possible. A McIntyre (p.c.) notes, in particular, cases such as (i):

(i) a. frequent share dumping by institutional investors in order to cause a price collapse
b. frequent tree planting by residents in order to block out the noise
a. the breaking of the door by Mary in two minutes in order to retrieve her locked-up dog
b. the stabbing of the emperor by Brutus for ten minutes in order to eliminate him from Roman public life

(15) a. (I watched) the door breaking (*by Mary) (*in two minutes) (*in order to retrieve her locked-up dog)
b. (I read about) the emperor stabbing (*by Brutus) (*for ten minutes) (*in order to eliminate him from Roman public life)

(16) a. the house demolition (*by the army) (*in two hours) (*in order to punish the family)
b. the facility maintenance (*by the management) (*for two years)

It goes without saying that event properties are not available in ER Syn-Compounds, hardly a surprising result given the absence of such event properties for analytic ER nominals to begin with, a matter I return to in section 12.5.2:

(17) a. the breaker of the door (*in seven minutes) (*in order to retrieve the luggage)
b. the door breaker (*in seven minutes) (*in order to retrieve the luggage)

Across the board, then, Syn-Compounds do not pattern with analytic argument-structure configurations which involve an event. This is, in turn, rather surprising, and as I shall proceed to show, presents an intractable problem for any lexical or syntactic account that subscribes to some version of (13i).

12.2.3 On the absence of event structure: syntactic problems

Consider now syntactic approaches to event structure and how they might bear on the absence of event structure in Syn-Compounds. Although eschewing a lexical execution, it is nonetheless the case that the accounts presented here and in Borer (2005b), as well as a host of other current studies, are crucially invested in the link between the presence of arguments and event structure. For such accounts, however, the conjunction of (13i) with the absence of event structure for Syn-Compounds presents a difficult puzzle. To illustrate, in Borer (2005b) “internal” arguments are not properties of listed items (be they verbs or roots), but rather emerge in the context of

Note, however, that many cases of “improved” event modification often correspond to cases in which an ING nominal can occur altogether without an “internal” argument, and hence is, on its own, a licit (intransitive) AS-nominal with the object acting as a modifier, rather than argument, to begin with (cf. (ii); see section 12.3.2 for some more relevant discussion):

(ii) a. frequent (madrigal) singing by amateur linguists in order to impress their students
b. frequent (teeth) cleaning in order to take away the plaque

Even more crucially, and as McIntyre himself notes, when embedded under a definite article considerable deterioration in judgment emerges:

(iii) a. ??the frequent share dumping by institutional investors in order to cause a price collapse
b. ??the frequent tree planting by residents in order to block out the noise

Taking now the cases in (iii) to represent the core cases, the possible improvement for e.g. (ia) and similar in the absence of an article is set aside here as a topic for future research.
fully projected event structure, always including at the very least E (Event Phrase), and at times ASP_Q or e (see Chapter 2, section 3 as well as Chapter 5, section 5 for the relevant structures). But if truck in *truck driving* or *truck driver* is indeed an internal
argument in the intended sense, it follows that Syn-Compounds must come complete with at least some event structure, i.e. at the very least with whatever functional structure would be licensing the “internal” argument. However, given the absence of grammatical event properties in Syn-Compounds, the origin of an internal argument, if indeed linked to an event node of some sort, becomes unclear. The paradox exists equally powerfully for other executions which appeal to event structure of some sort to license the internal argument, including, at the very least, van Hout (1994) as well as Alexiadou (2009).

It would likewise plague any attempt to adapt Ramchand (2008) to the structure of Syn-Compounds or AS-nominals. And in fact, in van Hout and Roeper (1998), the link between event structure and the internal argument originally proposed in van Hout (1994) is summarily abandoned precisely in order to preserve the status of the non-head in Syn-Compounds as an argument, in spite of the absence of event interpretation.

The absence of grammatical event properties in Syn-Compounds when combined with the presumed validity of (13i) is likewise problematic for views which link ING nominals, across the board, with grammatical event properties, e.g. through the claim that /_ing/ is the specific realization of nominalizations above v, or above VoiceP.4 The matter was already touched upon in Chapter 4, section 3.2, where I showed that contrary to the assumption made first by Grimshaw (1990) and subsequently by many others, R-nominals with ING do occur (and see also section 12.6.1 below for a review of this point).

The absence of any event properties in Syn-Compounds with ING, in turn, provides even more compelling evidence for the proposal that ING nominals need not be AS-nominals, precisely because of the presence of a putative direct object. An account for the properties of Syn-Compounds, then, appears to be available only if one is to give up on the assumption that ING, or more specifically ING_N[V], in and of itself, always entails the projection of grammatical event structure of some sort (and the corollary assumption that ING_N[v] nominals are always AS-nominals).

Before turning to the consideration of some current analyses which assume some version of (13i), we note that the problems encountered by syntactic and lexical

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4 By way of a brief survey, van Hout and Roeper (1998) assume that ING merges with VoiceP and TP and thereby ING nominals contain full aspectual structure while ATK merge with VP or V, thus allowing the exclusion of grammatical event nodes. Marantz (2000) as well as Alexiadou (2001) propose to derive AS-ATK nominals by embedding them under event structure, a proposal already reviewed in Chapter 2.

ING nominals, on the other hand, involve the spellout of /_ing/ above a v or VoiceP node and are hence per force AS-nominals. In a later execution, more in line with Borer (1999) and subsequent work, Alexiadou and Grimshaw (2008) as well as Alexiadou (2009) assume that both (AS)-ING and (AS)-ATK merge above grammatical event structure. However, in an effort to give a unified account to ING in verbal gerunds and in ING nominals, they also claim that in both, the merger of ING entails the merger of VoiceP, effectively forcing ING nominals to be AS-nominals. Guided by a similar desire to unify the treatment of ING across gerunds and derived nominals, Sichel (2010) assumes that ATK only licenses a single event but ING, in both gerunds and nominals, licenses a “complex” event, i.e. an event with a subordinate sub-event. Within this execution as well, ING nominals must be AS-nominals.

In a departure from her own earlier work, Harley (2009b) directly concedes that the properties of ING in Syn-Compounds are squarely incompatible with the claim that ING always attaches to v or VoiceP. The details of her own analysis of Syn-Compounds are discussed directly below.
accounts are extremely similar here (and as we shall see, will be similar all the way down the line), indicating the fact that at least when it comes to the statement in (13i), the resolution of the problem does not bear directly on the question of the syntax/lexicon division as such, but rather on the manner in which internal arguments are licensed. A distinction between lexical and syntactic accounts will, as it turns out, emerge and will turn out to favor a syntactic execution, but only once the assumption that internal arguments are listed with their head selectors, be they verbs or roots, is abandoned, and (13i) as its corollary is abandoned as well.

12.3 Some Non-solutions, Some Additional Problems

12.3.1 Root incorporation—a syntactic non-solution

We concluded that the assumption that internal arguments are associated with event structure is incompatible with the absence of event properties in Syn-Compounds, but only if (13i) is valid. Likewise, we concluded that the absence of event properties in Syn-Compounds is incompatible with the claim that ING nominals always entail a grammatical event. An obvious fix presents itself at this point which, it would appear, might allow us to hold on to (13i). Suppose, then, we abandon the view that ING entails a grammatical event or an AS-nominal (under any execution), a conclusion independently warranted by the fact that R-ING nominals do exist, as already noted. Suppose we now follow van Hout and Roeper (1998) in abandoning the claim that internal arguments are licensed structurally only in the context of events. Rather, suppose we adopt instead the proposal, put forward by Marantz (1997 and subsequent literature) and Harley (2009b, c), according to which roots (may) come with a specified internal argument (see Chapter 8, section 3). Would such a partial listing associated with roots and not with verbs and including only the internal argument solve our puzzle? At first blush, this does look promising. If internal arguments are properties of roots and are not contingent on the presence of event structure, then their presence—in fact their presence alone—would be predicted to occur without event structure and without the inevitable emergence of AS-nominal properties.

Alas, the solution is only apparent, as we shall shortly see. An explicit proposal that Syn-Compounds are formed by incorporating internal arguments into selecting roots is put forward by Harley (2009b). Concretely, Harley assumes that roots merge directly with their complements (including but not necessarily restricted to direct internal arguments), and that complements are always realized prior to the categorization of the root (see Chapter 8, section 3 for some discussion of this perspective). The merger of the root and its complement gives rise to a RootP. In regular clauses, the head root further merges with a categorial $v$ head, giving rise to a structure such as that in (18):

\[ \text{stud} \quad \text{chemistry} \quad (\text{Harley's (5b)}) \]
In Syn-Compounds, on the other hand, the complement incorporates into the root, and then the result, in its entirety, incorporates into an \( n \) head:

\[
\begin{array}{c}
\text{nP} \\
\sqrt{DRIVE_2} \\
\text{TRUCK}_1 \text{ drive} \\
\text{truck} \\
\end{array}
\]

Some important properties of (19) are worth highlighting. Note, first, that at no point is there a verbal head in the structure. This is a matter of significance for Harley, who seeks to reconcile this way the presence of an internal argument which is dependent on some head with the fact that English does not have an N+V compounding strategy. It is thus possible for Harley to analyze e.g. truck driver as never involving a stage at which truck actually incorporates into some V, drive, which would give rise to the otherwise unattested \([N\text{truck} [V\text{drive}]]\). Harley in fact highlights this result as evidence for roots and root selection, in preference to selection by categorically specified verbs. We note further that, as there is at no point a verbal projection in the structure, and under the assumption that grammatical events entail a verbal structure however derived or executed, it would appear that the absence of a grammatical event in (19) could come for free. (19), with its accompanying assumptions, thus seems to resolve the problem. Or does it? As further scrutiny will reveal, (19) in fact fails on a number of fronts, including, but not limited to, actually failing to account for the absence of grammatical event properties in Syn-Compounds.

Before proceeding, note that (19) comes at the cost of severing the relationship between internal arguments and grammatical event structure, thereby rejecting, across the board, the typology of derived nominals proposed in Grimshaw (1990). The problem for this as well as for any system which rejects the link between the internal argument and a grammatical event structure is not how to force an event interpretation, in certain contexts, in the presence of an internal argument: an event structure can always be added above the internal argument by merging the relevant additional functors. Nor is the presence of an argument within R-nominals a problem in itself, as already noted (e.g. fn. 4 of Chapter 2). The problem, rather, is how to capture the systematic absence of grammatical event properties when the internal argument is missing. If, as such accounts would have it, event structure is independent of the internal argument, the former should be able to occur when the latter is absent. As is clear, however, and as emerges directly from the Grimshaw diagnostics, such cases do not occur (see Chapter 2 for discussion).

A more serious problem for (19) (as well as for root selection in general) is the fact that Syn-Compounds with the set of properties already reviewed, may be formed from derived verbs:
And yet, in the case of derived verbs, the incorporated argument cannot possibly be selected by the root, nor can a constituent comprising [root+object] possibly incorporate into e.g. -ize. The general problem which derived verbs present for any account seeking to link the internal argument specifically to properties of roots was already discussed in some detail in section 3 of Chapter 8. When we turn specifically to Syn-Compounds, we find that their existence with derived verbs serves to fundamentally undermine the rationale guiding (19) to begin with. To see that this is the case, consider the structure that Harley (2009a) herself assigns to derived verbs, in a different context (structure repeated from (24) of Chapter 8). Specifically, in (22), the root √VERB incorporates into the (little) a head (which spells out as /πal/), and the result, verbal, incorporates into v (to spell out as /πalize/). The argument idea, in turn, is not in fact the internal argument of verbalize or of the root √VERB, but rather the external argument of a (little) a small clause, headed by √VERB-al (accusative assigning structure omitted for expository reasons):5

Suppose we were now to derive the Syn-Compound root verbalizing from (22), mimicking as closely as possible the operations in (19). The movement of √VERB to adjoin to -al (or to a, eventually to be realized as /πal/) as well as to -ize is straightforward enough. Consider, however, [idea]. It cannot incorporate into either the root or -al for structural reasons. It could, however, and plausibly does incorporate into verbalize. But in (19) n incorporates into a root. In (22), rather, it incorporates into a v, a situation which Harley (2009b) seeks explicitly to avoid, as already noted. In (19), note, a constituent containing the root and its object is formed which then incorporates into a category-bearing node. No such constituent, however, is available for (22). Nor can we assume that idea incorporates onto verbal. Not only would this

5 I set aside the question of whether the structure assigned to verbalize or to globalize in (24) of Chapter 8 could be generalized, e.g. to the cases in (i):

(i) a. crucify (give x cross-like properties?)
   b. patronize x (x = e.g. minorities) (give minorities patron-like properties?) ('condescend' reading)
   c. terrorize (give x terror-like properties?)

(20) a. this (*intentional) rule generalizing (*in order to do away with irregularity)
b. the glass encasing (*in plastic) (*in order to protect it from stone throwing)
c. (They noted) the minority patronizing (*for the past several years) (*by the supposedly progressive administration)

(21) a. (I noted) this (intentional) generalizing of rules (in order to do away with irregularity)
b. this encasing of the glass (in plastic) (in order to protect it from stone throwing)
c. (They noted) the patronizing of minorities (for the past several years) (by the supposedly progressive administration)
require downward movement, but such incorporation would give rise to [\(_a\)idea verbal], an otherwise unattested structure which furthermore cannot be assumed to give rise coherently to what is, for (22), a perfectly well-behaved compositional Content. Insofar as the most plausible incorporation analysis for idea verbalizing would involve the incorporation of idea into verbalize and the subsequent movement of [idea verbalize] to incorporate into \(n\) (to spell out as /\(\pi\)ing/), that derivation cannot possibly be subsumed under the general adjunction of roots to categorial nodes or under root selection of complements. Translated to Harley’s notation, the incorporation of idea into verbalize would need to be depicted as in (23):

\[
\begin{align*}
\text{\[v\langle \text{VERB-a\text{-}v}\rangle\]} \\
\text{\[v\langle \text{VERB-a\text{-}v}\rangle\]} \\
\end{align*}
\]

The gist of the criticism here is not that the operations in (22)–(23) are in principle syntactically illicit. Certainly, they could be assumed and possibly even motivated. What is significant, from our perspective, is that they cannot be reduced to root selection and that they involve the incorporation of an \(n\) into a \(v\), and not into a root. Insofar as (19) could capture the fact that English has Syn-Compounds, although it does not have an N+V compounding strategy, this result is lost for derived verbs. Insofar as it was possible to correlate the absence of a grammatical event in (19) with the absence of a verbal projection, that, too, no longer follows from (23). Rather, for (23), the question one must ask is why the \(v\) constituent cannot be embedded under some sort of event structure, on a par with AS-nominals, so as to give rise to an event reading for Syn-Compounds. Even more damagingly, if indeed something along the lines of (23) is required in the grammar alongside (19), the prediction would be that for root incorporation cases, there would be neither N+V compounding, nor event structure, but both would be attested for incorporation into derived verbs. No such effects are attested, nor, to the best of my knowledge, has any claim ever been made for their existence.

Finally, we note that it is (23), rather than (19), that generalizes, and that all cases of so-called root incorporation could be subsumed under (23), if the root categorizes prior to incorporation, i.e. as in (18). It therefore follows that there is, in actuality, no advantage to the assumption that Syn-Compounds are derived by incorporating an argument into a selecting root. The direct corollary is that there also appears to be no argument from Syn-Compounds for the selection of the internal argument by the root, contra Harley (2009b).
12.3.2. The obligatory transitivity of Syn-Compounds

Problems with derived verbs notwithstanding, the structure in (19) derives correctly, or so it would appear, the fact that internal arguments are the prime candidates for Synthetic Compounding. As it turns out, however, it fails to account for a rather crucial generalization concerning Syn-Compounds which is highlighted as the statement in (24):

(24) The Transitivity Effect
When the non-head is construed as an internal argument, Syn-Compounds must have a transitive construal.

In other words, when the non-head is construed as an internal argument, there must be an implied external argument in addition to the expressed internal one. The issue is particularly clear for causative/inchoative pairs, in which an identical verbal form may alternate between transitive and intransitive instantiations, as in (25)–(26) (the latter with derived verbs), and in the case of unaccusatives, where, by assumption, a transitive correlate is missing. The effect is of course attested in non-alternating transitive cases such as those in (27) as well:

(25) causative-inchoative pairs, transitive reading only
   a. ship sinking/ship sinker
   b. window shattering/window shatterer
   c. noise diminishing/noise diminisher (and compare with noise diminishment)
   d. tomato growing/tomato grower (and compare with tomato growth)

(26) causative-inchoative pairs, derived verbs transitive reading only
   a. salt crystallizing/salt crystallizer (and compare with salt crystallization)
   b. dust accumulating/dust accumulator (and compare with dust accumulation)
   c. fabric reddening/fabric reddener

(27) transitives
   a. city destroying/city destroyer
   b. child abusing/child abuser
   c. wall painting/wall painter
   d. pasta boiling/pasta boiler...

Importantly, (25)–(26) contrast with cases in which the non-head is not construed as an internal argument, but as an adjunct or modifier of some sort, and where no obligatory transitivity is attested. Thus (28)–(31) are ambiguous, and (32) fully grammatical. Note, in this context, that intransitives are licit as heads of Syn-Compounds, providing the non-head is an adjunct, rather than an internal argument.\(^6\)

\(^6\) Where possible, non-head adjuncts are illustrated with nouns rather than adjectives, to avoid mis-parsing regular attributive adjectives as compounded adjuncts.

Note the agentive, and hence at times coercive, flavor of (32)–(33) as well as (34)–(35), even in intransitive contexts and for verbs such as fall or diminish. I return to this matter in section 12.5, where I propose that ER is an ORIGINATOR function, and that ING, in all its occurrences, includes an incorporated ORIGINATOR clitic.
(28) a. the portside-sinking (of the ship) [ambiguous]
b. the nighttime-breaking (of the window) [ambiguous]
c. the mountain-growing (of the crops) [ambiguous]

(29) a. the winter crystallizing (of snow) [ambiguous]
b. the summer reddening (of the fabric) [ambiguous]

(30) a. a riverside sinker
b. a nighttime breaker
c. a mountaintop-grower

(31) a. a backyard verbalizer
b. a summer reddener

(32) a. the autumn falling (of leaves) (G)
b. the autumn wilting (of a rice plant) (G)
c. the nighttime diminishing (of solar energy) (G) [intransitive construal]

(33) a. a backyard faller
b. a summer wilter
c. (?) a nighttime diminisher

The obligatory transitivity effects in (25)–(27) also contrasts with the construal of “bare” R-ING nominals (cf. Chapter 4, section 3.2 and section 12.6.1 below) where no such effects are in evidence. Thus the expressions in (34) are all ambiguous between a transitive and an intransitive reading, and the intransitives in (35) are all licit:

(34) a. (yesterday’s) growing; sinking; dropping; verbalizing; reddening . . .
b. (This/she is) a grower/a sinker/a dropper/a verbalizer/a reddener

(35) a. (yesterday’s) wilting, departing, diminishing
b. (This/she is) a wilter; an (early) departer; a diminisher

Finally, the transitivity effects attested in Syn-Compounds with ING and ER contrast directly with the absence of any such effects for ATK compounds. Some minimally contrasting cases as well as others are in (36):

Recall that ING is homogeneous and hence anti-telic, as discussed in Chapter 4, section 4 (and see also below, section 12.6.2) and as such blocks obligatory achievement construal, thereby accounting for the ungrammaticality of (ia, b) and by extension, for that of (iia, b) quite independently of the obligatory transitivity effect in Syn-Compounds. Crucially, the claim here is that the licit intransitive cases in (28)–(33) involve an activity construal without culmination; see section 12.6.2 for direct evidence:

(i) a. *this kind of arriving (of the train)
b. *this kind of appearing/disappearing (of the rabbit) [transitive/intransitive]
c. *yesterday’s exploding [transitive/intransitive]

(ii) a. *train arriving
b. *rabbit disappearing/appearing [under an intransitive reading]
c. *bomb exploding
(36) a. noise diminishment; salt crystallization; idea verbalization; dust accumulation
   b. court investigation; bank referral; teenager invention; committee decision

In the paradigm of the Syn-Compounds above, (28), (29), and (32) are particularly worth noting, as these are cases in which the Syn-Compound in its entirety can serve as the nominal head of an AS-nominal taking an argument (cf. the parenthesized of-objects) and even potentially transitive, thus cases that flatly contradict the FSP (see (10)–(11) above where the matter is already noted, as well as examples in fn. 2). Clearly, then, it cannot be maintained that the compounding process as such deprives the resulting Syn-Compound of its ability to take arguments or to be associated with a grammatical event. Rather, the absence of grammatical event properties, in Syn-Compounds, is a statement applying exclusively to the relationship, however characterized, between the head and the non-head. It is within that domain and within that domain alone that grammatical event properties are excluded. It thus emerges that Syn-Compounds are just like any other derived nominal. They have an R-nominal instantiation, e.g. as in (37), and an AS-nominal instantiation, as in (38), and the fact that they are, in some internal sense, compounds rather than single C-core formations appears to play no significant role in this respect (and see section 12.7 for some important structural ramifications of this conclusion). Once viewed this way, however, it is clear that the non-head, as such, cannot be construed as an argument and must be otherwise accounted for:

(37) a. winter falling (*leave falling)
   b. riverside sinking (*ship sinking)
   c. backyard crystallizing (*snow crystallizing)

(38) a. nighttime falling of leaves
   b. riverside sinking of ships
   c. rooftop crystallizing of snow

12.3.2.1 Growing irony Returning now to the statement in (24), we note a certain irony associated with the fact that the Syn-Compound tomato growing is exclusively transitive, when compared with the obligatorily intransitive tomato growth. Recall that for those who subscribe to root selection of internal arguments, and in particular Marantz (1997 and subsequent work), crucial evidence for that hypothesis is summoned from the properties of grow in its derived instantiations, as illustrated by the contrasts between (39a–c) and (40a–c) (and see Chapter 7, section 3.4 for a more detailed discussion):

(39) a. the growth of the tomatoes
   b. *the farmer’s growth of the tomatoes
   c. *the growth of the tomatoes by the farmer

(40) a. the growing of the tomatoes (for seven weeks/in seven weeks) [ambiguous]
   b. the farmer’s growing of the tomatoes
   c. the growing of the tomatoes (by the farmer) (in order to prepare for the fall season)
Marantz (op. cit., following speculations in Chomsky 1970) suggests that the absence of a transitive reading for growth derives from the fact that it is the root, grow, that assigns the internal argument. In turn the external argument in such cases (and specifically when understood as an External Causer in the sense of Levin and Rappaport-Hovav 1995), is assigned by an additional layer of functional structure which is verbal in nature (e.g. \( \nu \) or VoiceP). As a result, the intransitive instantiation of grow need not be verbal, but the transitive one must be. The claim about the properties of grow is then augmented by the assumption that the affix -th is the spellout of \( n \) which attaches directly to the root, but without any intermediate verbalization. Growth, then, and by extension all derived nominals with the exception of those realized with \( /\pi \ing/ \), are the spellouts of nominalizations of the root (with or without an internal argument), and at any rate, well below the merger of any verbalizing structure. By contrast, the transitive grammatical reading in (40a, c) in this account emerges directly from the claim that \( /\pi \ing/ \) is the spellout of a nominalizer which merges with \( \nu \) or VoiceP, and is thus the only nominalizing form that can occur with transitive grow and its verbal layers.

Consider now this set of assumptions in conjunction with the structure in (19). By assumption, Syn-Compounds here are derived without any verbal layers. First, clearly, and in reference to the structure in (19), the claim that ING or \( /\pi \ing/ \) always signal the existence of a verbal layer clearly cannot be maintained within that analysis (as Harley 2009b in fact concedes). More seriously, however, as the derivation here crucially excludes any verbal layers, it also, by assumption, must exclude an External Causer reading, and be restricted to whatever interpretation may emerge from the combination of the root with its selected argument. In other words, Syn-Compounds with grow should pattern with growth in excluding a transitive reading. Instead, they enforce it.

If one nonetheless wishes to preserve (13i) as a statement concerning the arguments of roots (or, for that matter, the internal arguments of verbs, given the behavior of derived verbs with Syn-Compounds noted in section 12.3.1) while still accounting for the obligatory transitivity of Syn-Compounds, two possible repair strategies come to mind. One would be to claim that external, as well as internal, arguments are listed with the root and that Synthetic Compounding is akin to a lexical passive of sorts: an operation of suppressing the external and promoting the internal. Clearly, however, such an execution is fundamentally incompatible with any approach which seeks to minimize, if not eliminate altogether, lexical information and lexical computation. In turn, for a system that wishes to avoid stating external argumental selection on the root, or the verb for that matter, the only way to reconcile (13i) with (24) would be to consider the domain of Synthetic Compounding to be considerably larger than that proposed in Harley (2009b), and to include in it whatever verbal structural nodes are responsible for the emergence of external arguments in general, and External Causers in particular. On the bright side, that just might give a boost to the faltering claim that ING may only merge with a higher, verbal domain. On the not-so-bright side, however, note first that tomato growing or ship sinking must be transitive, while the growing of tomatoes with its full verbal projection is ambiguous between a transitive and an intransitive reading.
More damagingly, we seem to have now come full circle. The assumption that Syn-
Compounds are derived by incorporating the internal argument into a selecting root,
which appeared, initially, to account for the presence of an internal argument
without grammatical event properties, first had to be extended to include the
incorporating of arguments, however assigned, into derived verbs, and now seems
to work only if one assumes that the domain of Synthetic Compounding is extended
so as to include a fully specified event structure, complete with whatever event
functional structure is implicated in licensing an *External Causer*. For that approach
as well, then, one must now ask why it is that Syn-Compounds have none of the
properties of AS-nominals associated with e.g. (40a–c)—no aspectral modification,
no by-phrases, no implicit argument control, no agentive modification, and so on.

We note, by way of completing the picture, that the problem carries over to any
account which subscribes to (13i), while at the same time assuming that the licensing
of the external argument (be it an *External Causer* or otherwise) is associated with
event structure of any sort. Thus consider the possibility that the internal argument is
selected by a verbal head of some sort which does not carry an event entailment, or by
a simplified event which includes the internal, but not the external argument. It
remains the fact that the transitivity effect within Syn-Compounds, as stated in (24),
can only be accounted for if reference is made to the existence, or lack thereof, of an
external argument, including the external argument of *grow*, by assumption licensed
in a bigger, event-denoting structure, and thereby raising anew the original puzzle:
why is event structure missing in Syn-Compounds?

12.3.3 Whither the Unaccusative Hypothesis?

Viewed from an even broader perspective, the obligatory transitivity of Syn-
Compounds as stated in (24), when combined with the claim in (13i), give rise to a
picture that is fundamentally incompatible with the Unaccusativity Hypothesis,
insofar as the formation of Syn-Compounds appears to make a distinction between
the licit incorporation of internal arguments of transitives and the illicit incorpor-
ation of internal arguments of intransitive predicates.7

7 Harley (2009b) observes the existence of transitivity effects, but only in the context of adjectival Syn-
Compounds as in (ia, b) and with the external argument explicitly expressed. She proceeds to state the
correlation, informally, as in (ii). Note that as stated here, in (24), it is the construal of the non-head as an
internal argument that results in the transitivity effect. Harley (2009b), however, states the contingency the
other way around: i.e. it is (obligatory) transitivity, where present, that results in an obligatory incor-
poration of the internal argument:

(i)  a. a wheat-growing farmer…. [ = Harley’s (9a, f)]
    b. quick-growing wheat

(ii) “Arguments must be introduced by ‘first merge’, attaching to the Roots which select them, so
modifying adjuncts will be introduced second, adjoining to a projection of the Root. However, in
cases where no internal argument is introduced, the modifier will be the first thing Merged to the
Root” (Harley 2009b, p. 137. Emphasis mine, HB).

In a corollary footnote, Harley further suggests that the internal argument of Change-of-State verbs such as
*grow*, (presumably in both their transitive and intransitive instantiations), is not actually a sister of the
root, but rather merges as the specifier of some vP-internal projection, thereby, presumably, accounting for
its failure to incorporate in e.g. (ib).
12.3.4 Incorporation into a nominal—another non-solution

For completeness, we must consider another possible syntactic execution of the idea in (13i)—one in which the internal argument is selected by the derived noun itself (possibly through inheritance), and where syntactic incorporation would adjoin that argument to the de-verbal nominal, essentially as in (41):

(41) a. [\text{n} \quad \text{truck} \quad \text{[\text{n} \quad \text{driving}] \quad \text{truck}}]

b. [\text{n} \quad \text{truck} \quad \text{[\text{n} \quad \text{driver}] \quad \text{truck}}]

I am not actually aware of current proposals specifically along such lines, but interestingly enough, and from a very distinct perspective, the proposal in (41) is directly critiqued by Ackema and Neeleman (2004) as part of their general critique of syntax-based word formation operations. Assuming, correctly I believe, that (41) amounts to deriving \text{truck driving} from its derived nominal correlate, clearly an instance of an AS-nominal, their chief counter-argument concerns their observation that at least some verbal idioms, as in (42), translate into possible Syn-Compounds, but never to licit AS-nominals, with either ING or ER (see also McIntyre 2009), making the latter a rather unlikely source for the former.\(^8\)

The comments, admittedly brief and informal as they are, are unfortunately neither sufficiently complete nor sufficiently explicit. What is missing is any addressing of the systematic failure of unaccusative objects to incorporate, even when no adjuncts are present, and when there is no transitive variant at all, as in the intransitive construal of (iii), or the applicability of the generalization to cases which do not involve Change-of-State contexts. Likewise missing is an account for the full grammaticality of (iii) in its transitive construal, where, by the comments as given, it is the internal argument, rather than the adjunct that should have incorporated. The problem, in turn, harks back to the empirical problems with the FSP already noted in (10)–(12) and discussed in section 12.3.2 in conjunction with (28), (29), and (32):

(iii) winter growing of tomatoes

Finally, if the internal argument occurring with e.g. √\text{GROW} is not a sister of the root (or any other selecting head for that matter), and is rather a specifier merging above the root, as Harley (2009b) suggests, the direct result is that, indeed, the internal argument could not incorporate into the root. On the other hand, however, the transitive emergence of \text{tomato growing} would require incorporating \text{tomato} into a verb, not into a root, as the transitive variant of \text{grow}, perforce, emerges as a result of the movement of √\text{GROW} to some higher functional verbal head. Transitive \text{grow}, then, is a derived verb, rather on a par with e.g. \text{verbalize}, and presents, for (19), the very same challenges already discussed in section 12.3.1.

\(^8\) The absence of an idiomatic reading for the AS-nominals in (42) when contrasted with its availability for Syn-Compounds certainly suffices to argue Ackema and Neeleman’s (2004) point barring a derivation of the latter from the former. Nonetheless, and as noted already in the appendix to Chapter 9, AS-nominals based on verbal idioms are in fact relatively common when of-insertion is not otherwise required, and some cases with of occur as well (and see section 12.4 below for the possibility of the serving of time with the VP idiomatic reading, but one that is distinct from time serving). VP idioms within Syn-Compounds certainly do not correlate with their existence within AS-nominals, but are nonetheless rather idiosyncratic, and thus leg pulling and whistle blowing, but *bucket kicking and *path crossing.

Finally, we note that from the perspective of atomic Content matching as laid out in Chapter 9, what is problematic is not the listed Content of Syn-Compounds such as leg pulling, which is entirely straightforward, as we shall see in section 12.4. Rather, what is potentially puzzling is the (sporadic) existence of the very same idiomatic Content in conjunction with phrasal idioms that include ExP-segments, such as pulled my leg and which would thus exclude a single en-search. For some general comments on phrasal idiomatic expressions which touch upon some of these issues, see the appendix to Chapter 9.
Their conclusion about the absence of the derivational relations in (41) is in turn directly augmented by the fact that if Syn-Compounds were to be derived from AS-nominals we would expect the former to share the argument structure properties of the latter, contrary to fact. Furthermore, given the grammaticality of (43a) it is not clear why the very same operation that derives (41) would fail to derive (43b) from (43a), and with the latter, recall, in violation of the obligatory transitivity of Syn-Compounds:

(43) a. the sinking of the ship [intrans.]; the falling of the tree
b. *ship sinking [intrans.]; *tree falling

Finally, we note that some Syn-Compounds make for particularly poor AS-nominals, rendering the latter a rather unlikely source for the former:

(44) a. *the acting fast; *the smelling strong (*compare with gerunds such as Mary’s acting fast)
b. ??the frying in the pan (*compare the pan frying of the pasta)
c. *the going to church

In short, the analysis in (41) does not fare any better in attempting to resolve the major problems we already noted with the incorporation of the internal argument. It fails to address the absence of grammatical event properties in Syn-Compounds, it offers no insight on their obligatory transitivity as stated in (24), and it sheds no light on the impossibility of incorporation for unaccusative arguments.

12.3.5 A lexicalist treatment—third non-solution

Under any plausible lexical execution, the event properties of AS-nominals stem either from the noun itself, or from the verb embedded within it. According to the first execution, the noun itself may be marked as an event or as an argument taker (Grimshaw 1990; Siloni 1997; i.a.). According to the second approach, it is the verb that takes arguments, rather than the noun. In turn, the arguments of the verb may be inherited by the noun derived from it (Selkirk 1982; Di Sciullo and Williams 1987; Lieber 2009; i.a.). Crucially, and to capture the relevant properties of
AS-nominals when contrasted with R-nominals, all these executions would need to link the presence of a grammatical event to the presence of argument structure, and the absence of grammatical event properties to the absence of arguments. But from such a perspective, the contrast between (14) and (15), repeated here, remains entirely unexpected.

(45)  
    a. the breaking of the door by Mary in two minutes in order to retrieve her locked-up dog
    b. the stabbing of the emperor by Brutus for ten minutes in order to eliminate him from Roman public life

(46)  
    a. (I watched) the door breaking (*by Mary) (*in two minutes) (*in order to retrieve her locked-up dog)
    b. (I read about) the emperor stabbing (*by Brutus) (*for ten minutes) (*in order to eliminate him from Roman public life)

If we continue to assume the validity of (13), then the non-head in e.g. emperor stabbing is an argument of stab(ing). In turn, emperor certainly is the argument of stab(ing) in the stabbing of the emperor. That the latter is a grammatical event but not so the former simply cannot be derived, under such circumstances, without some added mechanisms. In turn, the hypothetical mechanisms that might be needed appear less than attractive. One could assume, for instance, that grammatical event properties are severed from argument realization, and that some additional specification, syntactic or lexical, renders AS-nominals grammatical events. This assumption, alas, would pull the rug from underneath the Grimshaw typology to begin with. Alternatively, one could claim that some absorption is associated with Syn-Compounds, depriving them of their event reading. That however would amount, again, to severing grammatical events, indeed the event argument, from other arguments, thereby equally forcefully undermining the original, valuable typology under consideration.

We did note briefly in section 12.3.2.1 that to capture the transitivity of Syn-Compounds stated in (24) a lexicalist account could be presumably devised so as to suppress or otherwise existentially bind the external argument, but force the realization of the internal one. Crucially, the operation would have to be restricted to dyadic predicates, thereby excluding the formation of Syn-Compounds for unaccusatives, or, for that matter, for unergatives. But even such a fix would not quite suffice, as it

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9 For example, and as in Grimshaw (1990), through the assumption that the argumental matrix of the head includes an event argument.

10 In their lexical account of Syn-Compounds, Ackema and Neeleman (2004) attribute the properties of AS-nominals to the merger of N with a phrase (e.g. NP), while Syn-Compounds involve the merger of terminals (specifically [[N+V]+aff]), and with the non-head of the Syn-Compound absorbing the theta role that would otherwise be assigned by its verbal sister. I agree with the architecture proposed for Syn-Compounds (although I see little reason to exclude it from the syntax; see section 12.7 for discussion). It is nonetheless not clear how the putative distinction between merger with N and merger with NP could derive the event properties of AS-nominals or exclude them for Syn-Compounds, or, for that matter, how thematic absorption can account for the obligatory transitivity effects or for the failure of intransitive unaccusative arguments to give rise to well-formed Syn-Compounds.
turns out, as any restriction of Syn-Compounds to transitive, dyadic entries would fail to capture the grammaticality of both the transitive and the intransitive variants of (28)–(31), or the grammaticality of (32), where transitivity is not obligatory because the non-head is not construed as an internal argument. To the extent that the incorporated adjuncts in (28)–(32) are not arguments and are presumably not lexically specified, accounting for the “preservation” of the internal argument in such cases is not a trivial matter.

To conclude this section: it appears that any attempt to hold on to the insight originally suggested by the First Sister Principle is quite simply unworkable. The inevitable conclusion, then, is that a successful account of Syn-Compounds must avail itself of other means of explaining their properties, and that (13i), under any presently imaginable execution, is unworkable and should be dispensed with.

12.4 Compositionality

Before we turn to an account of the derivation of Syn-Compounds, another crucial distinction between AS-nominals and Syn-Compounds must be discussed. Thus far, our discussion of AS-nominals and Syn-Compounds has highlighted two important distinctions between them, as summarized in (47):

<table>
<thead>
<tr>
<th></th>
<th>AS-nominals</th>
<th>Syn-Compounds</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grammatical events</td>
<td>+</td>
<td>−</td>
</tr>
<tr>
<td>Obligatory transitivity</td>
<td>−</td>
<td>+ (within a prescribed domain)</td>
</tr>
</tbody>
</table>

In this section, I will pursue yet another difference between AS-nominals and Syn-Compounds—one related to the presence, or lack thereof, of compositional reading. This difference will serve to augment the already massive arguments against (13i). It will also serve to provide us with a crucial insight into the structural difference between AS-nominals and Syn-Compounds that will inform the subsequent discussion in an important way. Beyond that, it will point to an extremely strong and compelling correlation between syntactic complexity and compositionality, and lend strong support to the syntactic representation of words.

Recall that AS-nominals are always fully compositional, a matter discussed at some length in Chapter 9, section 1.3. The correlate of this claim, as noted, was that non-compositional derived nominals cannot take arguments or be associated with a syntactic event complex. As noted in that context, the obligatory compositionality of AS-nominals is very surprising from any possible theoretical perspective, and virtually impossible to state within lexicalist systems. There is simply no possible reason, from a lexicalist perspective, to correlate idiosyncratic, listed Content with the impossibility of argument structure. On the contrary, the most basic premise of lexicalist approaches is that what is listed is precisely what is not otherwise predicted,
including, in particular, the argument structure of any otherwise non-decomposable or non-composed form.

Within a syntactic approach to the formation of complex words, however, an account for the puzzle is available. Specifically, I proposed that all arguments, including the event argument, are licensed through ExP-segments, and that Content matching is limited to the C-core. The relevant contrastive structures of AS-nominals and R-nominals are thus as schematized in (48) and (49) respectively, in which each boxed constituent marks a possible domain for en-searching and thus potentially for the matching with atomic Content. As ExP-segments do dominate the verbal C-core in AS-nominals but not in R-nominals, the domain of Content for AS-nominals may not include the nominalizer. That it may include the nominalizer in R-nominals, in turn, follows directly from the absence of any event structure or its arguments intervening between the C-core and the nominalizer.

(48) **AS-nominals**

(49) **R-nominals**

Armed with this brief summary, suppose we now return to Syn-Compounds. As it turns out, and as noted already by Ackema and Neeleman (2004), Syn-Compounds, or things that look distinctly like them, need not be compositional. Furthermore, their non-compositionality in the relevant instances cannot possibly be traced back to the syntactic (or lexical) incorporation of an argument of a verb or a root of any kind for the simple reason that the corresponding VPs do not share that atomic Content. Indeed, at times there isn’t even an independent verb (e.g. *monger*). Of particular interest is (50b), as *to serve time* is a possible VP idiom, but the idiomatic
Content of *timeserver* is distinct and entirely unrelated to it, and as such, is altogether not available in the clausal domain:11

(50)  

a. warmongering warmonger(er) *to monger (a) war  
b. time-serving time-server opportunism/(ism) (!)to serve time be incarcerated  
c. babysitting babysitter *to sit (a) baby  
d. line producing line producer film accountantcy #to produce (a) line  
e. crystal-gazing crystal-gazer fortune telling #to gaze (into) a crystal  
f. facelifting facelifter #to lift (a) face

Importantly, the atomic Content associated with the Syn-Compounds in (50) is not available for AS-nominals either, thereby providing yet one more argument to the effect that Syn-Compounds are neither derived from AS-nominals, nor appear to share any source structure from which both could be plausibly derived. Observe that the serving of time directly shares the idiomatic meaning of the corresponding VP, and not that of the Syn-Compound, as already noted in the appendix to Chapter 9:

(51)  

a. *the mongering of war d. #the lifting of faces  
b. #the serving of time (VP idiom only) e. #the producing of (a) line  
c. #the sitting of (a) baby f. *the gazing of (#into) crystal

If the account of non-compositionality outlined in Chapter 9 and summarized here is on the right track, the inevitable conclusion from the existence of non-compositional Syn-Compounds is that they do not contain an internal ExP-segment of any kind. Importantly, this conclusion is entirely consistent with the fact that they do not have grammatical event properties, just as the non-availability of non-compositional Content for AS-nominals correlated directly with the presence of grammatical event properties.

It thus appears that we have here a convergence of evidence from very distinct domains all pointing towards the exact same conclusion. Complex syntax, complete with an Extended Projection specifically associated with (grammatical) event structure, is the *sine qua non* of event-related arguments, including the event argument. It is only in that context that both event properties and arguments can emerge. In turn, that very same set of S-functors and ExP-segments which license event structure blocks the emergence of non-compositional Content. Conversely, in the absence of complex event syntax, grammatical event properties are not attested, S-functors and ExP-segments are not present, but non-compositional Content is possible. The explicit statements of the correlations as they are fully manifested in the contrastive behavior of AS-nominals and Syn-Compounds are in (52):

---

11 Special care needs to be taken here not to attribute the existence of the Syn-Compounds in (50) to the nominalization of complex verbs such as *babysit*, *copy-edit*, *proofread*, etc., all arguably cases of “back formation” (so called) whose existence postdates the existence of the corresponding Syn-Compound, as documented explicitly by Marchand (1969). I return to this matter in some detail in section 12.7.
(52)  

a.  
   i. \((S\text{-functors} \leftrightarrow) \text{ExP-segments} \rightarrow \text{compositional Content}\)  
   ii. non-compositional Content \(\rightarrow\) no ExP-segments \((\leftrightarrow\) no S\text{-functors)}

b. grammatical event (event argument) \(\leftrightarrow\) ExP-segments \((\leftrightarrow S\text{-functors)}

The correlations in (52) cannot be coincidental, nor can they be captured, directly, by any lexical-entry-based account. Rather, they provide extremely strong evidence not only for a syntactic representation of event structure, but for a complex, articulated syntactic derivation that is involved in the construction of so-called “words”. In the absence of such a derivation, the correlations simply cannot be stated, nor can the distinction between AS-nominals and Syn-Compounds be coherently explained.

12.5 Syn-Compounds—What Remains

12.5.1 Explaining what remains

In the previous sections, I established that viewing the non-head in Syn-Compounds as a (genuine event-related) argument inevitably gives rise to a series of unresolvable difficulties and theoretical contradictions. But if so, does anything remain of the claim originally attributed to Marchand (1969), according to which there are special synthetic compounds which express an argumental dependency on a verbal-nexus head? In other words, is the distinction between Syn-Compounds and root compounds in any way motivated? An alternative, and a simple one, would be to assign to Syn-Compounds (some version of) the structure in (53a) or possibly in (53b) and assume that as such, they do not differ from any other root compound, and that the argument construal for the non-head is but an implicature.\(^{12}\)

\[
\text{ING/ER} \\
\text{truck} \\
\text{ING/ER} \\
[_{C=V}^{\text{DRIVE}}] \text{ING/ER} \\
\text{truck} \\
[_{C=V}^{\text{DRIVE}}] \text{ING/ER}
\]

An investigation of the erstwhile effects attributed to the FSP reveals, however, that a residue does remain that restricts argument construal in Syn-Compounds, and which consists, specifically, of the descriptive generalizations in (54) (and with (54b) representing the Transitivity Effect otherwise stated in (24):

(54)  

Restrictions on Argumental Construal, Syn-Compounds:

a. ING and ER Syn-Compounds exclude a “subject” construal for the non-head.

b. When the non-head of an ING and ER Synthetic Compound is interpreted as an “object”, Syn-Compounds must be transitive.

\(^{12}\) The representations in (53) and in the remainder of this chapter are simplified for presentational reasons, in that adjunction, suggested for derivatives in section 4 of Chapter 6, is set aside. With adjunction, the structure would be as in either (i) or (ii) (and similarly, in section 12.7 below, structures (128a, b):
By way of attempting to account for these generalizations, I suggest that the properties of ING as well as ER Syn-Compounds are attributable directly to the properties of the suffixes used. Specifically, I would like to propose the statements in (55a–c):13

(55)  a. ER_N is an ORIGINATOR function.14
b. ING_C[V] is HOMOGENEOUS across all its (non-gerundive) instantiations (including A and the progressive participle. See Chapter 7, section 5 for discussion).
c. ING_N[V] incorporates an abstract pronoun with an ORIGINATOR function (henceforth OR, possibly an abstract realization of ER; see section 12.5.2 below).

The properties attributed to ING_N[V] in (55b–c) are the very same as were associated, in Chapter 4, with AS-ING nominals in general. Insofar as Syn-Compounds do involve ING_N[V] but are not AS-ING nominals, the claim invites a unified treatment of the semantics and syntax of ING_N[V] across its nominal (non-gerundive) occurrences, altogether a desirable outcome if achievable. Empirical evidence for the

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13 I set aside here and in the remainder of the discussion cases of middle ER such as oven-roaster. Insofar as such cases have neither corresponding ING Syn-Compounds nor corresponding AS-nominals, they are orthogonal to the main plot here and in Part I of this book. Middle interpretation is further missing, across the board, in all cases of ER merger with nouns (cf. section 12.5.2). The complete absence of such correlates thus gives rise to the distinct possibility that middle ER, phonological realization notwithstanding, is a distinct functor.

14 Following the general convention used throughout this book, capital letters indicate a semantic function, and hence OR (for ORIGINATOR). Originator, on the other hand, has been systematically used to indicate the role itself, rather than the function. E.g. in event contexts, a DP in Spec,E is not a function, but nonetheless does come to be associated with the role Originator.
properties attributed to ING and ER in (55a–c) is reviewed in section 12.6. Before turning to that evidence, however, it is worthwhile outlining how (55a–c) in fact account for the restrictions on argumental construal stated in (54).

Turning first to (54a), we note that, rather importantly, there is clearly no across-the-board restriction against having an Originator implicature associated with the non-head of compounds, including some with “verbal nexus”. This was already illustrated in cases in (36), some repeated and augmented in (56):

(56)  a. army intervention; court investigation; bank referral; teenager destruction; teacher recommendation; government decision
      teacher recommendation; government decision
      b. court intrusiveness; government destructiveness; teenager inventiveness

Nor is an argument-like implicature broadly corresponding to an Originator barred for compounds without a verbal nexus, as (57a) illustrates. For that matter, an “internal” role implicature is available without verbal nexus as well, as (57b) illustrates (and note that in the absence of event structure, the notion of “role” is frequently too vague to be appropriately pinned down—e.g. is chicken food ‘food that chickens eat’, or is it, rather, ‘food for chickens?’):

(57)  a. “Originator” implicature:
      expert job; court verdict; chef feast; teenager game; chicken food; Wagner opera; toy story; expert opinion
      b. “Undergoer” implicature:
      orchid nursery; guilty verdict; seven-course meal; chicken food; toy story

In section 12.5.2 I offer some comments on “roles” which are available without “assignment” as in (56)–(57), and by extension in Syn-Compounds as well. Focusing, rather, on the observation that such unassigned roles are available, suppose we assume that in all compounds Content constraints on the non-head are mostly determined by relevance (and see Lieber 2009 for a detailed articulation of the range of possible construals). Differently put, the non-head in compounds is in general free to refer to any discourse entity which, contextually, may be plausibly linked to the head, including entities that would be interpreted as arguments were they to occur in the context of a grammatical event, including Originator or an Undergoer of some kind, as in (56)–(57). Given this relative freedom, however, what now emerges as a rather surprising effect is the fact that an Originator construal for the non-head is specifically barred, but only in the presence of the nominalizers ING$_N_{[V]}$ and ER.

An account for this specific restriction emerges however if we assume that an Originator construal cannot be associated with two distinct entities within the same minimal functional domain, and where we may take the relevant “functional” domain to be an Extended Projection. Specifically, if we assume that ING$_N_{[V]}$ has an OR function incorporated into it as in (55c), then it follows that chef in (58a) or man in (58b) cannot be interpreted as an additional, distinct Originator. If, however, chef and man refer to a manner, and not to an Originator, thereby functioning as a
modifier of some action performed by an otherwise existing Originator, the expressions become much improved, as is exemplified by (59a–b):15

(58)  a. *chef stewing (of the dish) (with chef as Originator)
  b. *child driving (of the truck) (with child as Originator)
   → two Originators in one functional domain

(59)  a. (?) chef stewing (of the dish) (by incompetent trainees)
   → licit if in reference to a manner of stewing typical of chefs, i.e. chef-style stewing attempted by somebody who may or may not be a chef
  b. (?) child handling (of the elephant) (by incompetent adults)
   → licit if in reference to a manner of handling typical of children, e.g. irresponsible, undertaken by somebody who may or may not be a child

Identical effects are expected for ER, given the claim in (55a) that ER is an OR function. For ER, we note, the non-head is construed as a modifier of an individual and not of an event, a distinction that follows from the distinct semantics of ING and ER:

(60)  a. *chef stower (of the dish) (with chef as Originator)
  b. *child handler (of the elephant) (with child as Originator)
   → two Originators in one functional domain

(61)  a. chef stower (of the dish)
   → licit if chef is a modifier of stower (a stower who is a chef)
  b. child handler (of the elephant)
   → licit if child is a modifier of handler (a handler who is a child)

We concluded that while the non-head in compounds is in principle free to be construed as both an argument-like element or as a modifier, in the context of ING\textsubscript{N}[V] and ER it may not refer to an Originator, as an Originator is already present by virtue of the Originator reading built into both ING\textsubscript{N}[V] (through OR) and ER. Consider now how this very same claim accounts for the obligatory transitivity of Syn-Compounds, i.e. for (54a).

Suppose we review first the unfolding of the derivation when the non-head of a Syn-Compound is construed as a modifier, e.g. morning sinking, or morning sinker, and where both transitive and intransitive construals are available. In view of the statements in (55a–c), we expect such expressions to embed an Originator reading. We further expect the ING variant to be homogeneous, i.e. to be interpreted as non-quantity, or an activity, where relevant. Beyond that, however, no expectations emerge. In particular, we have no expectations involving any Undergoers. As a result, both sinking and sinker may be construed as referring to either a transitive event of

15 We note that the Originator incorporated into ING is by assumption grammatical, while the non-head is pragmatically interpreted. I leave aside here any precise statement of how these two modes of interpretation interact with each other.
sinking or an intransitive event of sinking without any difficulty, a prediction that is directly verified by the ambiguity of (62a–b):\(^{16}\)

(62)  a. morning sinker
Their missiles are nighttime sinkers (of boats)
This boat is a morning sinker (i.e. it sinks in the morning)

b. morning sinking
The deliberate nighttime sinking (of boats) has been going on for years
the morning sinking (of our boat) (our boat could have sunk on its own)

Consider, however, boat sinking. As in (62a–b), an Originator construal is obligatory by virtue of the semantic functions of $\text{ING}_{N[V]}(+\text{OR})$ and ER. But now if we construe boat specifically as an argument of any sort, the inevitable result would be a transitive construal. Such transitivity would follow directly from the fact that any argumental construal cannot be that of an Originator, as an Originator construal is otherwise available and is in fact mandatory. As a result, any additional argumental construal would need to take as its discourse reference some other argument, thereby leading to the appearance of transitivity and thereby deriving (54b).

The Transitivity Effect in (54b) we note, is missing in AS-ING nominals (cf. (63)) where the overt or covert presence of an Originator is certainly licit, both in transitive and intransitive cases, as (64) illustrates:

(63)  a. the (deliberate) sinking of the ship (by the enemy in order to . . .
  b. the frequent sinking of the ship (on its own)

(64)  a. Kim’s lifting of the package
  b. the lifting of the package (by Kim) (in order to dry its bottom)
  c. Salome’s frequent (sensual) dancing
  d. the frequent dancing (by Salome) (in order to seduce Herod)

The account for the contrast between R-ING nominals and AS-ING nominals, when it comes to the possible presence, in the latter, of a double Originator, is, however, rather straightforward. Thus consider the fuller grammatical context in which Syn-Compounds, an instance of R-nominals, recall, and AS-nominals are embedded, as in (65a) and (65b) respectively:

(65)  a. [DP .... [N ([non-head]) ING (OR)]]
  b. [DP .... [N ING (OR) ]E Originator .......]

As discussed at some length in Chapters 4 and 5, a DP merging at Spec,E within AS-nominals would need to move to receive case, thus merging either in some specifier of a nominal ExP-segment, where it would be of-marked, or in Spec,D, where it would be ’s marked. It nonetheless remains the case that it would leave

\(^{16}\) We also predict that in both transitive and intransitive construals sinking should be atelic, i.e. homogeneous, and that achievements should be excluded. See a brief note on this matter in fn. 6. See section 12.6.2. for the relevant evidence.
behind a copy which is interpreted, crucially, as an argument in the context of a grammatically projecting event structure, and as such, is not in the same functional domain as the OR function associated with ING. Rather, it is directly licensed in the context of the event. In turn, the co-occurrence of an overt Originator together with an OR function incorporated into ING_{N[V]} might be structurally modeled along the lines of cases of clitic doubling, e.g. as in the Spanish case in (66a), or the Hebrew DP internal doubling, including within AS-nominals, in (66b–c):17

(66) a. lo_{i} vimos a Juan_{i}
    him_{i} saw.we to Juan_{i}
    'We saw Juan’

  b. tmunat-a_{i} šel Ruti_{i}
    picture-her_{i} of Ruti_{i}
    'Ruti’s picture’

  c. harisat-o_{i} šel ha.’oyeb_{i} ’et ha.’ir
    destruction-his_{i} of the.enemy_{i} om the.city
    'the enemy’s destruction of the city’

Putting the account on a more formal footing, suppose we consider a system of functional composition very much inspired by Lieber (2004), although differing from it in some theoretical assumptions.18 Specifically, we can think of OR, by assumption a pronominal incorporated into ING_{N[V]}, as the highest argument of ING_{N[V]}, as in (67a). Following a similar logic, we can think of E as a relationship between an Originator in Spec,E, its highest argument, and some event-related node within its scope, if one exists, and which is, like E itself, a member of {Ex[V]} (e.g. ASP_{Q} or e) as in (67b) (ExS_{2}=a subordinate event domain):

(67) a. ING_{N[V]} (OR (Originator))

  b. E (Originator, (ExS_{2}))

We may now embed (67b) under (67a), to give rise to the representation in (68):

(68) [ING_{N[V]} (OR (Originator)), (E (Originator, (ExS_{2}))) ]

17 We note as an aside that if the same role may not occur more than once within the same functional domain, this might provide an account for so-called Kayne’s Generalization—the observation that (at least in some grammars) clitic doubling cases can only be licensed through the insertion of a preposition, as is indeed the case for (66a, b). The preposition, under such a rationale, wouldn’t be inserted for reasons of Case (as originally argued in Jaeggli 1982), but rather in order to introduce a distinct functional domain within which a DP could receive the same role as the clitic with which it is coindexed. The configuration for the coindexation in (66c) clearly indicates that such doubling is licit. Importantly, however, doubling cases within nominals in Hebrew are role-neutral and do not privilege Originators.

18 The primary fundamental divergence from Lieber (2004) involves the assumption that functional composition is associated exclusively with rigid designators, and never with substantive items, be they roots or lexemes of any other sort.
The semantic composition in (68) is now subject to the Principle of Coindexation in (69):

(69) **Principle of Coindexation (slightly modified from Lieber 2004)**

When semantic functions are composed, coindex the (highest) argument of the head function with the (highest) argument of the immediately subordinate function. Such indexing must give rise to a configuration consistent with the semantic conditions on the highest arguments, if any.

Applying (69) to (68) now gives us directly the coindexation of OR with the Originator argument of E, as required:

(70) \( \text{ING}_{N[v]} (\text{OR}_1 (\text{Originator}_1)), (E (\text{Originator}_2). . . . ) \)

Note that the representation now explicitly licenses two instances of an Originator, one an argument of \( \text{ING}_{N[v]} \) and the other an argument of E. The only restriction on the structure amounts to forcing these two instances to be identified, a feat accomplished through the Principle of Coindexation in (69). It therefore now follows that an Originator may occur overtly in AS-ING nominals in addition to the one expressed through \( \text{ING}_{N[v]} \), but that such a situation should be impossible in R-ING nominals in general, and in Syn-Compounds in particular, quite simply because there is no additional Originator-licensing domain that could compose with \( \text{ING}_{N[v]} \).

Recall now that a referential DP, if not otherwise associated with a role, will be interpreted as an Originator in Spec,E, but that E, in and of itself, need not assign an Originator (see Chapter 2, section 3 for a review.) The accurate representation of E should thus be as in (71) with Originator being optional:19

(71) \( E ((\text{Originator}), (\text{ExP-segment})) \)

As it turns out, however, any AS-ING nominal derivation in which E is not associated with an Originator will fail to converge. Differently put, and rather significantly, we can now derive the fact noted but not explained in Chapter 4, that AS-ING nominals must have an Originator. Consider why this is the case: although the Originator functions associated with OR (and hence with \( \text{ING}_{N[v]} \)) and with E are distinctly licensed, the Principle of Coindexation requires that when E is embedded under \( \text{ING}_{N[v]} \), their highest arguments be coindexed, and that such coindexation be "consistent with the semantic conditions on the higher argument". It therefore follows that \( \text{ING}_{N[v]} \) may only compose with events which have an Originator. Specifically, if the highest argument of E is any role but an Originator, coindexing would fail on semantic grounds. Specifically, the configurations in (72) are now ruled out, as illustrated by (73) (and we note in this context that (72a) is independently

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19 And with cases of E missing both an Originator and a subordinate event-related node being e.g. the case of weather verbs.
ruled out because of the incompatibility between ASPQ and the homogeneity of ING):\textsuperscript{20,21}

(72) a. \(*_{\text{DP \{N \{ING \{OR_1 \{\text{Originator}\}\}\}\}\{E Subject-of-Quantity\}_1 \{ASP-Q \{Subject-of-Quantity\}_1 \} \} \}

b. \(*_{\text{DP \{N \{ING \{OR_1 \{\text{Originator}\}\}\}\{E Subject-of-State\}_1 \} \} \}

(73) a. *the exploding of the bomb

b. *the smelling of the stew (Experiencer construal)

Consider now the applicability of the very same system to ING Syn-Compounds, with the representation of ING\textsubscript{N[v]} and OR as in (67a) and indeed, as it would be in AS-ING nominals, but this time without an embedded event structure, and rather with a non-head which merges directly with ING\textsubscript{N[v]}, allowing no intermediate S-functors or ExP-segments of any kind:

(74) [[non-head] ING\textsubscript{N[v]} \{(OR \{\text{Originator}\}\) ]

In (74), there could be no event structure that includes the non-head, but excludes ING\textsubscript{N[v]}. This emerges directly from the fact that Syn-Compounds, as already extensively argued, do not contain the functional structure required for the emergence of grammatical event properties. An Originator reading for the non-head can be neither assigned nor implied, or two occurrences of an Originator would emerge within a single functional domain. In the absence of any function that could independently license an Originator interpretation to the non-head, it can only be interpreted as a secondary predicate, a modifier, as we already saw. Should that

\textsuperscript{20} The overlap notwithstanding, the homogeneity of ING, cannot be derived from the presence of OR in conjunction with the Principle of Coincidence, as cases of ASPQ are ruled out as well in transitive configurations which have an Originator alongside an object, and where the latter cannot be interpreted as a Subject-of-Quantity, i.e. as in (i) (see Chapter 4, section 4 for the relevant discussion as well as section 12.6 below):

(i) a. Kim’s (*gradual) formulating of several procedures {*in a few weeks/??twice}

b. Robin’s (*gradual) dissolving of these chemicals {*in three hours/??twice}

\textsuperscript{21} Spec,E, note, may fail to host an argument altogether, even in the absence of a Subject-of-Quantity and ASPQ. Such would be, for instance, the case of weather verbs, which, in turn, do not allow AS-nominals: exactly what we would predict.

A more complex situation emerges when an Originator is present in the event, but is not in Spec,E, as in the case of Short, passive AS-ING nominals where I assumed the Originator to merge in Spec,e as in (ia, b), giving rise to the AS-ING nominals in (iia, b) (see discussion in Chapter 5, section 5):

(ii) a. the handling of the elephant (by the boy)

b. the (repeated) voting against the bill (by the young Republicans)

If we assume now that E and e enter a semantic composition, a rather natural claim given the fact that e is licensed through the existence of E, we can now derive the grammaticality of (iia, b) from the assumption that the Principle of Coincidence allows for the transitivity expressed by the coinercidence in (iii).

Specifically, and because there is no semantic value or index otherwise associated with Spec,E, it can function as a vehicle for transferring the semantic identity of OR to Spec,e (note that Spec,P-Voice could not be semantically composed with either E or e under this account):

(iii) \{\text{DP \{N \{ING \{OR_1 \{\text{Originator}\}\}\}\{E \}{Originator}_1 \} \} \}

\text{PP}
modifier happen to correspond to a possible argument, transitivity will emerge not from the object reading, as such, but rather from the fact that an independent Originator is, by assumption, at all times present within Syn-Compounds.

12.5.2 ER—some open questions

We note, first, that attributing to ER the properties of an actor of some kind, otherwise normally instantiated as an agent or an instrument, is hardly controversial. In turn, and as already shown in (58)–(62), the effects in (54) are attested for ER nominals as well as for ING_{N[V]} nominals, lending at least some support to the claim that ING_{N[V]} incorporates an instance of an abstract ORIGINATOR, our OR.

A number of questions concerning specifically ER are nonetheless worthy of note, although a full analysis will not be attempted. First, we note, AS-ING nominals are “excused” from the double-Originator restriction, an effect, I claimed, which should be attributed to the fact that the second occurrence of the Originator is licensed by grammatical event structure. In contrast, the parallel structures with ER are ungrammatical:

(75)  
(a) the sinker of the ship; the verbalizer of the noun [transitive/*intransitive]
(b) the ship’s sinker; the noun’s verbalizer [transitive/*intransitive]

(76)  
(a) the wilter (*of the flower); the diminisher (*of the noise) [intransitive construal]
(b) The jumper (*of the boy); the dancer (*of Salome) [intransitive construal]

and compare the wilting of the flower; the jumping of the boy)

At least one possible account for the contrast between ING and ER in this domain would be to suggest that ER nominals never take events as their arguments. Differently put, structures such as those in (77) are altogether excluded, contrasting, as such, with the fully licit ING case in (70). In the absence of any other domain in which a second Originator could be licensed, the ungrammaticality of the intransitive variants in (75) follows, as does the exclusion of any “complement” in (76) that would be construed as identical with ER:

(77)  
(a) ER_{N[V]} [E
(b) ER_{N[V]} (Originator), (E (Originator), (ExP-segment))

Some direct evidence for the claim that ER never merges with E comes from the fact, already observed (cf. (17a)) that the bulk of the diagnostics for grammatical event developed in Grimshaw (1990) are missing in ER nominals. As noted by Randall (1985), ER comes with additional restrictions barring adjuncts and indirect complements which are attested in AS-nominals in general, or in AS-ING nominals in particular:

(78)  
(a) the breaker of the door (*in/*for seven minutes) (*in order to retrieve the luggage)
(b) the (*frequent/*constant) dancer (*for three hours) (*in order to please the king)
(79)  a. *the dancer in the road  \\
    b. *the talker to animals  \\
    c. *the putter of the books on the shelf  \\
    d. the fryer of pasta (*in the pan)  \\
    e. the kisser of the bride (*at noon)

If we now subscribe to the view that AS-ER nominals do not exist, a unified account would emerge not only for the relevant cases of ungrammaticality in (78)–(79), but also for the exclusion of intransitivity in (75) and for the impossibility of Originator doubling in (76).

At least one challenge for the claim that ER may never embed an event, in turn, comes from what is at times referred to as the “episodic” reading of ER nominals, especially (but not exclusively) in the presence of complements (see Levin and Rappaport 1988; Rappaport-Hovav and Levin 1992; as well as most recently Alexiadou and Schäfer 2010). In their own analysis of ER nominals (although not in the context of Syn-Compounds), Alexiadou and Schäfer (2010) propose that they always embed an event. Normally, such an event gives rise to an episodic reading, the hallmark of which is the fact that the event associated with the doer as expressed by the ER nominal needs to have taken place, as noted originally by van Hout and Roeper (1998). We note that this is not strictly speaking the case (cf. (80a), (81a)), but it does appear to be the case, when comparing e.g. (80a, 81a) with (80b, 81b) that the actual existence of the “consumer” or “director” under consideration is contingent on the event taking place. There may not be any consumers of goods, but insofar as they are asserted to exist, they have to have consumed some goods. There may not be a director for the film, but it is not possible to refer to an actual existing individual who never directed any films as “the director of the film” (and see directly below on Barker’s 1998 notion of “episodic linking” as it applies to the suffix EE and by extension to ER):

(80)  a. The consumers of these goods, if there are any who are stupid enough to buy them, will be very disappointed.  
    b. #The consumers of these goods were too wise to buy them.

(81)  a. The director of the film, if one is ever found, will have to resolve this conflict.  
    b. #a director of films who never directed any films

The episodic reading, however, need not hold across the board for ER nominals, and specifically for “bare” ER nominals, an actual event, it seems, is not required in order to assert the existence of the doer:

(82)  a. We have turned into a society of consumers in which nobody can afford to actually consume.  
    b. Here comes the director who never directed a thing.

Alexiadou and Schäfer (2010) analyze cases of “bare” ER, e.g. (82), as involving a generic operator binding the event (“dispositional”, following Mittwoch’s 2005 treatment of object drop in generic present tense). The existence of a generically bound event within the relevant bare ER-nominals is, however, rather questionable. Specifically, suppose we consider them when compared to Mittwoch’s (2005) own cases of dispositional predicates, cases of object drop in English generic present tense, as in (83), and where a generically bound event clearly is present:
(83) a. John writes.
   b. Mary directs.
   c. Jenny consumes.
   d. Colleen runs.

If John writes or directs, he most certainly could not die without having written or directed anything, and if Colleen runs, she must run frequently and habitually. Rather, Mittwoch’s dispositional cases most naturally lend themselves to a habitual, frequent event interpretation. Furthermore, the very same generic reading holds when an object is present. It is not the absence of the object, as such, that gives rise to a generic reading, then; rather, it is the generic reading that allows the omission of the object:

(84) a. John writes novels.
    b. Mary directs operas.
    c. Jenny consumes alcohol.
    d. Colleen runs marathons.

But as such, these truly generically bound predicates contrast rather sharply with the behavior of the ER nominals in (82), where a habitual (as well as episodic) reading is possible, but is neither forced nor necessarily the most salient one. Rather, the bare ER nominals in (82) behave very much like a “defining property”, in the sense of Roy (2006, 2013), a characterization that would allow us, e.g., to refer to Jones as a doctor (un docteur rather than bare docteur, in French) even if he never, or hardly ever, practiced, and which would display lifetime effects. We note that a generic event construal is available in the presence of an overt object in (84). It is excluded, however, for the cases of ER nominals with complements, showing yet again that equating bare ER nominals with the cases in (83) is the wrong way to go. In turn, Roy’s (2006, 2013) defining properties are very clear cases of individual modification (rather than predicate or event modification) and as such are precisely the cases in which the existence of an event is typically disputed (e.g. in Kratzer 1988 and much subsequent work).

In view of the conclusion that dispositional ER-nominals do not have an event embedded within them, but episodic ones might, it is worthwhile asking whether Syn-Compounds constructed with ER pattern, in this respect, with the former or with the latter, and the answer appears rather straightforward: while an episodic reading may be possible with ER Syn-Compounds (and see on this matter McIntyre 2010), Syn-Compounds do not force an episodic reading and are perfectly compatible with a dispositional one.22

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22 Rather relevant in this respect is the following forum post on the interpretation of ER (Insanitarium, <http://www.reddit.com/r/linguistics/comments/e4frz/the_english_er_suffix_and_its_semantics/>):

So Angus and McTavish are sitting around in the pub. Angus takes a long pull at his drink, looks out the door and says “McTavish, you see that bridge out there?”
   “Ay, Angus, I do.”
   “S’a good bridge. Built it with me bare hands, I did. But do they call me Angus the Bridge Builder?”
   “No, Angus, they don’t.” McTavish says sympathetically.
   “And you see that roof on the school. S’a good roof, took me a month, with me bare hands.”
   He takes a pull again. “But do they call me Angus the Roof Maker?”
   “No, Angus, they don’t.”
   Angus takes another deep pull at his beer, his face going red.
   “But, you f**k one sheep…”
(85)  a. the film director who died without ever having directed a single film
    b. We are all luxury consumers (at heart) without the means to do anything about it.

It thus emerges that although episodic ER nominals may have a complement (albeit as I shall suggest not an event argument either), that complement clearly cannot be the source of the non-head in (85), or we would predict, erroneously, an episodic reading for the Syn-Compounds. Insofar as the Syn-Compounds in (85) have the same properties as instances of defining property ER nominals, they clearly cannot involve any event, nor can the non-head be interpreted as an argument of one. The conclusion is, of course, entirely consistent with the claim otherwise already made in the previous sections, according to which Syn-Compounds do not contain an event (internal to the compound) and the non-head cannot possibly be an event argument. In fact, it also lends independent support to the claim that bare ER nominals with a defining property reading do not embed an event.

While the absence of episodic reading for ER Syn-Compounds clearly does tally with our general approach to the formation of Syn-Compounds, it nonetheless leaves open the question of what episodic ER nominals are, and if their episodic reading does indicate the presence of an event, why are such events restricted (cf. (78)–(79)) and why is Originator-doubling excluded (cf. (75)–(76))—all characteristics which distinguish these nominals from AS-ING nominals?

To this dilemma, we might as well add another one. I have proposed here that ER is an ORIGINATOR function giving rise to an originator interpretation. Specifically, such an Originator is not assigned, according to this claim, nor is it licensed in the context of any event. If anything, it may create an event implicature. But are there, indeed, roles such as Originator that are “free” and need not be licensed in the context of events? Specifically, and given the status of ER as a C-functor, with the representation in (86), are we to assume that it may add an Originator role in any context in which it is otherwise licit (and see directly below on the nature of the CCS of ER)?

(86)  \[ \text{ER}_{N[x]} \quad (\text{Originator}) \]

The very same question applies, of course, to the assumed abstract pronounal that incorporates into ING\(_{N[v]}\) and which has an OR function. In fact, OR and ER may very well be one and the same function, pronounal across the board, and with /_\text{er}/ its phonological realization when not otherwise incorporated. But what, again, is the status of such an OR function, away from any event?\(^{23}\)

By way of attempting to shed some light on these questions, suppose we return to the original notion of Originator and event participation roles as proposed in

\(^{23}\) If ER is an instance of OR then we must allow for ER to lose its CCS when it is incorporated into ING (and note in this context that ING itself is not a complement of ER, as it is ING rather than ER that projects). A number of resolutions are available that would nonetheless allow us to unify ER with the clitic incorporating into ING. A full execution is not attempted here, however, for reasons of space.
Borer (2005b) (and see Chapter 2, section 3 for a brief review). Importantly, in XSM, event argumental roles are not assigned, as such, nor is event structure contingent on the presence of arguments or roles. To wit, activity and stative events, may have no role-assigned arguments whatsoever, as in the case of the weather and temporal predicates in (87a); and a telic, quantity event may have no object, as in the case of the particle constructions in (87b):

(87)  a. It is raining; It snowed last night; It is late; It is Monday morning already!
     b. The army took over; I took to linguistics like a duck takes to water

Rather, argumental roles, in that system, are entailments from events and event interpretation, as mediated through syntactic structure. In the presence of a particular event structure, say that associated with activity, a referential DP in a particular position would be construed as the Originator of such activity. In the presence of a quantity, telic event, a DP in a particular position would be construed as a special kind of Undergoer, and specifically, as one which undergoes a quantifiable change (Subject-of-Quantity). At least some aspects of the interpretations associated with these specific DPs (e.g. Undergoer, Originator), crucially need not be event-induced as such, nor are they assigned by the specific S-functors involved in constructing the event. They are, rather, “exapted” to do a job in a particular structural context, where the grammar may or may not also add interpretative layers (e.g. “quantifiable change” to an Undergoer). It thus emerges that the existence of an Originator construal, as such, does not entail in any way the existence of a grammatical event structure. It may, of course, imply the existence of an event nonetheless, quite simply because an actor typically implies action; but such an implicature is by no means indicative of the existence of a grammatical event, and furthermore, it is directly cancellable. To wit, an Originator implication is arguably present for the possessor constructions such as those in (88), although rather clearly no grammatical event is involved:

(88)  a. [My book] is coming to an end.
     b. Wish me luck with [my (2-hour) concert/date/dinner] tomorrow night.

From this perspective, then, it is entirely possible for ER to be an OR function with or without the presence of grammatical event structure. That such a function is indeed available for ER without the presence of grammatical event structure is not only evident from the bare ER cases in (82) and the Syn-Compounds in (85) but also from the general distribution of ER in English, frequently attaching to nouns where an OR function is clearly present, but event structure is extremely unlikely. Alongside such cases we also find ER attaching to roots which are not attested in isolation, and which certainly do not represent verbs. In these cases as well, an Originator interpretation results.24

24 The cases in (ia), fully productive, allow for ER with a subject interpretation, of sorts, but are nonetheless arguably stative, and hence by assumption cannot involve an Originator. Some cases of less predictable stative ER cases are in (ib). Notwithstanding these unexplained occurrences, most statives, as
a. ballooner; birder; banker
b. biographer; etymologer; ethnographer; executioner; intelligencer; adulterer
c. passenger; messenger

If we proceed to assume that /eer/ is an alternative spellout of ER, specifically in nominal contexts, an even larger class of cases emerges in which ER attaches to a form that otherwise has no event interpretation with an Originator interpretation resulting. We note that in all these cases, although a grammatical event is presumably not present, the presence of an Originator results in the implicature of an event, best captured through the paraphrase in (90b):

a. engineer; electioneer; auctioneer; balladeer; bandoleer; charioteer; conventioneer; gazetteer; mountaineer; musketeer; mutineer; pamphleteer; privateer; profiteer; racketeer; sloganeer . . .
b. An individual or a device that does {mountains, chariots, pamphlets, etc.}

To recap the discussion thus far, ER, a C-functor and possibly a pronoun projects N across all its instances, but its CCS, rather atypically, allows both V or N. Its CCS notwithstanding, it is endowed with a semantic function which is always OR, by virtue of which it may imply an event, thereby giving rise to an episodic implicature.

Insofar as ER acts like a pronominal, and insofar as ER names a specific role that is not contingent on the presence of an assignor, indeed, altogether not contingent on the presence of a grammatically projecting event, ER\textsubscript{N[V/N]} becomes extremely close, formally, to the description offered by Barker (1998) for the affix EE, clearly a positive outcome. Taking as his starting point a fundamentally lexicalist approach to grammatical events complete with thematic grids for verbs and linking rules, as in Levin and Rappaport-Hovav (1988, 1992, 1995), Barker argues strongly against linking the semantics of EE with the argument structure of any verb. Pivotal to his argumentation are cases in which such direct assignment by the verb is problematic or clearly implausible, as well as properties of EE which clearly go beyond any argumental properties of any potentially selecting verb. Among the latter one can count the sentence of EE, predicted, do not easily allow for ER, as is illustrated in (ii). See also (125)–(127) and related discussion below:

(i) a. New Yorker; westerner; easterner
   b. New Ager; teenager; owner; dweller

(ii) a. #(long) liver; #inhabiter; #knower; #perceiver; #resider; #stayer
    b. #irritator; #pleaser; #annoyer; [non-Experiencer reading only, if any]
    c. toucher; smeller; feeler; lover [non-stative reading only]

The reader is referred, in particular, to Levin and Rappaport (1988) and Rappaport-Hovav and Levin (1992) for some relevant discussion.

A similar V/N alternation is attested for the CCS of the equivalent affix in Dutch, as noted by De Belder (2011) (see Chapter 7, section 5 for discussion). In both English and Dutch, it is the only affix which shows an oscillation between N and V relative to its CCS. To the present author, it seems clear that something about ER is missing here, such that it is uniquely able to merge with both N and V. A fuller investigation, however, is not attempted.
a restriction that clearly goes beyond any that are imposed systematically by the presumed selecting heads or, for that matter, by functional event structure of any sort. Among the former, he notes mismatches between roles assigned by verbs and the role corresponding to EE (cf. 91a), as well as EE merger with nouns (cf. 91b): 26

(91) a. amputee
   adoptee
   payee
   gazee
   retiree
   not an argument of amputate
   patient
   goal; *patient
   (???)

   b. chargee
   cognizee
   patentee
   ‘holder of a charge upon property’
   ‘...he to whom cognizance was made’
   ‘one to whom letters patent have been granted...’

   as well as:
   absentee; custodee; debtee; giftee; letteree; refugee; benefactee; biographee;
   executionee; festschriette; malefactee; mentee; missionee; philanthropee;
   politicee; redundantee; ...

   Fundamentally, Barker (1998) proposes that EE is associated with a coherent, independent role, broadly an Episodic Undergoer (marked specifically by lack of volition and by sentence, in his account), which, while akin in some sense to roles that are assigned by verbs, is not necessarily identical to any of them, precisely insofar as EE is subject to additional constraints which are not attested in the domain of events (e.g. sentence), and insofar as its properties do not cohere, syntactically, with any particular event-related or verb related role. All these, Barker argues, mandate the establishment of EE as a separate function carrying its own role. In the context of such a function, the stem to which EE attaches serves to modify the episode in which the reference of EE is involved, although such an episode need not be grammatically otherwise represented, except as an implicature of the episodic nature of EE. 27

   Finally, in assuming that roles are available independently of events, Barker appeals, specifically, to Dowty (1989), whose definition of thematic roles is as in (92), and which Barker interprets as a commitment to the existence of the relevant entailments independently of the use that may be made of them in the context of events:

(92) Thematic Role minimally is a non-trivial set of semantic entailments which partly characterizes a natural class of argument positions. (p. 77)

26 Note that at least some instances of EE appear to attach to adjectives as well, as in absentee, and redundantee. Absent, however, does occur as a verb, and in the case of redundant, it is quite possible that the merger is with redundant, with the [t] representing an allomorph rather than an adjective.

27 "When we consider the set of amputation events...the meaning of the verb amputate guarantees the existence of a person undergoing amputation, even though there is no syntactic argument which corresponds to this participant...[T]he fact that the person undergoing amputation is a participant of every amputation [sub]event is sufficient to enable a set of amputation events to characterize the -ee noun amputee..." (Barker 1998: 714)
It is now fairly clear that the characterization of the properties of ER as described directly above tallies extremely closely with those of EE as described by Barker (1988). Like EE, ER is a function, OR, which defines its own role (Originator) and which may, but need not, characterize an argument position in the context of events. Like EE, that role is not contingent on the presence of licensing event structure, and finally, like EE, the Content of the stem to which ER attaches, be it an N or a V, serves to modify whatever episode may be implied by the presence of ER. Grammatically, I submit, what is provided by way of helping the interpretation of either amputee or amputator is the description in (93). All other aspects of the interpretation of e.g. amputee or amputator emerge from implicatures themselves appealing to some Content as modified by world knowledge.

(93)  
  a. he who is a sentient Undergoer $\land$ an amputation episode  
  b. he who is an Originator $\land$ an amputation episode

By way of a final perspective, it is worthwhile evaluating Barker’s specific claim that the properties of EE, as he discusses them, cannot be syntactic, and must rather be semantic. By syntactic, what Barker has in mind is a canonical lexicalist system such as that expounded in Levin and Rappaport–Hovav (1995), in which arguments are listed in verbal entries (or entries of some other argument-selecting lexical item) complete with specific linking instructions concerning their syntactic merger. To wit, if a verb such as adopt were to be listed lexically, it would come, presumably, with two arguments, one external, an Agent (or correlate), and the second internal, a Patient (or correlate). This configuration further comes with general linking rules which require the Patient argument to merge as a direct object. Pay, on the other hand, would be listed with three arguments, and specifically, in addition to an Agent and a Patient, a Goal to be realized, syntactically, as an indirect object. Finally, amputate would have the same configuration as that of adopt, but the Patient would be specifically in reference to the body part to be severed. And yet amputee does not refer to that body part, but rather, to its (affected) possessor, which is altogether not represented in the lexical grid of amputate. From such a perspective—and given the existence of adoptee, amputee, and payee, not to mention giftee and debtee—it is indeed entirely clear that the properties of EE cannot be accounted for by appealing to any syntactic structure thus projected from lexical entries and lexical information. Following the very same rationale, if ER, as suggested in Levin and Rappaport (1988) and Rappaport-Hovav and Levin (1992), is the realization of an External Causer or external argument of some otherwise listed verb, it is clear that neither the ER instantiations in (89) nor /nmeer/in (90) could possibly be an instance of such an ‘External Causer/external argument’ ER, for the simple reason that the bases with which ER merges in (89) and (90) do not have thematic roles by anybody’s theory.

A non-lexicalist syntactic execution of Barker’s (1998) analysis of EE is, however, not only possible but also entirely plausible once argument structure and event structure are severed from the lexicon, and are assumed, rather, to be associated with an event-related Extended Projection which dominates the C-core. Within
such a system, the presumed structures of both EE and ER would be as in (94). As in the case of R-nominals, the merger here is syntactic in nature, but wholly within the C-core. As no grammatical event nodes are included, there is little reason to expect the Content of the base, such that it exists, to function as anything but a modifier of some implied episode, and with the general felicity of the expression contingent exclusively on world knowledge and Content, i.e. conceptual factors:

(94)  

One difference between EE and ER does emerge, however. Barker (1998) specifically claims that EE is always episodic. A final note is warranted concerning the claim made by Barker that EE only has an episodic construal, and thus e.g. an unemployed employee or unadopted adoptee are true contradictions. This, however, was not the case for ER, where, as we saw already, (film) directors could exist without ever having directed (see (82) and (85) above), and where an episodic reading was only obligatory in the presence of complements, as in (80) and (81).

An explanation for the optionality of the episodic reading for ER, but not for EE is not attempted here. Given this optionality, however, and given the fact that ER must be episodic in the presence of a complement, one could claim that it is precisely the correlation between an episodic reading and the presence of a complement that argues for a grammatical event within ER nominals.

As it turns out, however, and without actually offering an account for the effect, an episodic reading emerges in an identical fashion when a nominal head takes a complement even in cases where no verbal nexus is present, and where the presence of a grammatical event is otherwise extremely implausible. Similar effects, note, are attested for e.g. biographer, although the stem with which ER merges here is not verbal, and thus by common assumptions would not host event structure (examples with indefinites are provided to exclude an account based on the referentiality of definite descriptions):

(95)  

a. *the star of the movie (by training) who died before he made any movies  
b. *the novelist of the thrillers (by training) who never wrote any thrillers  
c. *the poet of {these Scottish ballads/white verse} (by training) who failed to have written any ballads/verse  
d. *the biographer of those celebrities (by training) who didn’t write any biographies  
e. the chef of the pastry (by training) who never made any pastry
a. *a star of movies (by training) who never starred in any movies
b. *a novelist of (gaudy) thrillers (by training) who never wrote thrillers
c. *a poet of ballads/white verse (by training) who never wrote any ballads/verse
d. *a biographer of celebrities (by training) who didn’t write any biographies
e. *a chef of pastry (by training) who never made any pastry

As predicted, no such contradiction emerges when the ER nominal has no comple-
ments, or when it is part of a Syn-Compound:

a. How she managed to become a (movie) star without ever starring in any movies is quite a mystery . . .

b. the (thriller) novelist (by training) who never wrote thrillers or anything else
c. the (white verse/ballad) poet (by training) who never wrote a single poem, in verse or otherwise
d. the (celebrity) biographer (by training) who never wrote any biographies
e. the pastry chef (by training) who never made any pastry

An account for the necessity of episodic reading for the cases in (95)–(96) vs. its potential absence in either bare ER-nominals or in ER Syn-Compounds is not attempted here. We note, however, that if the observation here is on the right track, what is excluded, specifically, is a defining property reading for the cases in (95)–(96), and by extension, for the cases in (80)–(81). On the other hand, we need not assume that an episodic reading is actually excluded for bare ER nominals or for Syn-Compounds. Rather, I will proceed to assume that such an episodic reading is available, and may exist alongside a defining property reading (and on this latter point see also McIntyre 2010).

Two important conclusions emerge from our discussion of ER. One is the conclusion that ER, in all likelihood, may not dominate an event complex. It is precisely because of that that we do not find full grammatical event properties within the scope of ER, as demonstrated in (78)–(79) and it is because of that that we do not find Originator-doubling in contrast with AS-ING nominals, as illustrated in (75)–(76). Our second conclusion concerns what ER is. Importantly, we establish its existence as an independent function associated with a stand-alone role, very much like EE. Insofar as our grammar must allow such stand-alone role functions, we are fully justified in assuming exactly such a function, be it ER itself or an abstract clitic which shares its ORIGINATOR function and which is incorporated into ING.

12.6 R-ING/Synthetic Compounds—Homogeneity and Originators

12.6.1 Simple event nominals

In Chapter 4, section 3.2. I already discussed evidence for the existence of R-ING nominals, contra the claim originally made in Grimshaw (1990). In view of the fact that Syn-Compounds have the characteristics of R-ING nominals rather than AS-nominals, this is hardly surprising and in fact lends rather robust support to the conclusion that ING does not force the projection of syntactic event structure. In Chapter 4, I also presented considerable evidence for the claim that AS-ING
nominals are homogeneous and entail an Originator, an empirical result that is directly accounted for by the properties of ER, together with the assumption that it incorporates into ING, as outlined directly above. As I shall directly show, equally robust evidence is available to show that R-ING nominals are homogeneous and entail an Originator, likewise providing empirical evidence for the analysis developed here.

We note now that typically (although not exclusively), R-ING nominals are simple events, in the sense of Grimshaw (1990). An event denotation, in turn, is an implicature from the episodic nature of the OR function incorporated, by assumption, into all instances of INGs\(_n[V]\). That R-ING nominals—and Syn-Compounds—are, indeed, comfortable as simple events can be amply demonstrated:

(98)  a. This is a type of (inappropriate) parenting that (may) last(s) many years, and tends to occur when education is deficient.
    b. Yesterday’s (vicious) bullying started at dawn, took place in my back yard, and lasted 2 hours.
    c. This is a type of (irresponsible) compounding that takes place whenever linguists get together.

(99)  a. The party dancing started at 8pm and lasted well into the night before it was stopped by the police.
    b. The turkey carving will take place at my house from 5pm onwards.

It is worthwhile pausing, however, before proceeding, to consider the circumstances under which a simple event reading may be licensed. Crucially, and although referring to events, the R-ING nominals and the Syn-Compounds in (98)–(99) do not allow event modification internal to the DP. This was noted for Syn-Compounds in section 12.2.2 above. The relevant cases are repeated here:

(100)  a. yesterday’s (unexpected) bombing (*in order to terrify the population)
    b. this year’s (new) craving (*for several months)
    c. this type of (repeated) bullying (*in order to make up for low self-esteem)

(101)  a. (I watched) the door breaking (*by Mary) (*in two minutes) (*in order to retrieve her locked-up dog)
    b. (I read about) the emperor stabbing (*by Brutus) (*for ten minutes) (*in order to eliminate him from Roman pubic life)

There is little reason, then, to conclude from (98)–(99) that there is grammatical event structure in either R-ING nominals or in Syn-Compounds. Even more damaging to any putative claim that simple events include some grammatical event structure is made in Alexiadou (2009), where it is assumed to be induced by the presence of the verb, and where, it would appear, it is the verb that assigns the event argument. We note that such an account cannot be extended to the cases in (102), with the identical event-like properties. For direct arguments against linking the event argument with the verb see Borer (2005b).
structure is the fact that not only class, lesson, event, concert, movie, etc. can receive a simple event construal, but so can just about any nominal expression if accompanied by a predicate that implies an event, and if sufficiently compatible with world knowledge:

\[(102)\]  

a. My book should be done this weekend.  
b. The wall lasted for seven years and started to disintegrate gradually after that.  
c. We started the table at 8pm and people kept drifting in and out all night.  
d. The picnic area emerged into existence gradually over several years and finally took shape last spring.  
e. Electra ended at 7:42pm.  
f. ‘The King’s Crown’ took place exactly at 5pm.

Of some interest is the case in (102f). To the extent that any sense can be made of it, it requires assuming that The King’s Crown is a name of a particular event, say a game, and that this game took place at a particular time. It is clear, however, that insofar as this construal is possible, and quite possibly it is the only possible one, it would be rather hard to claim that there is anything inherent to the structure of The King’s Crown that facilitates this event construal. Similar logic applies to Electra, a proper name, which nonetheless is construed here as an event. Altogether, then, it appears that simple events are formed not by the DPs that appear to denote them, but by the predicates that modify them. Insofar as a table can be started, table will be construed as an event to be interpreted relative to context. Insofar as a picnic area, or for that matter anything at all, can be transformed over time, it, too, will be construed as an event with the appropriate predicate. That, however, was not the case for AS-nominals—in such cases, as was entirely clear, the grammatical event characteristics were internal to the DP and once present, could not be coerced. The matter is of some importance, we note, insofar as we will continue to assume that the simple event reading that may be associated with R-ING and Syn-Compounds is in and of itself an implicature, and does not entail grammatical event structure. Insofar as any effects do stem from the simple event implicature in conjunction with the truly grammatical properties of ING, we will take them to be grammatical delimitations on the range of implicatures that may be consistent with R-ING nominals and Syn-Compounds.

12.6.2 R-ING is homogeneous

Fundamentally, the evidence that AS-ING nominals are homogeneous was based on two factors. First, and in line with Bach (1986), I assumed that homogeneity within the domain of events translates into non-quantity predicates—atelic ones. Second, within the domain of nominals, the property of homogeneity was assumed to correlate with “mass”.

At least some of these tests cannot be applied to R-ING nominals, precisely because a grammatical event structure is missing and range assignors to ASP relate third persons are thus independently not available. Nonetheless, and insofar as some event implicature is possible with both R-ING nominals and Syn-Compounds, and given the presumed homogeneity of ING, we expect such event implicature to fail for events which are
understood as ontologically non-homogeneous, e.g., instantaneous events. The absence of instantaneous events, achievements, for AS-ING nominals was already noted. We now predict the corollary absence of achievement-like construal for R-ING nominals and Syn-Compounds, a prediction confirmed by (103)–(104). Note specifically that for Syn-Compounds, the homogeneity effects are in place both for adjunct non-head construal and for an argument non-head construal. No such effects are attested for the R-ATK nominals in (105), nor are any effects expected, or attested, for the variable behavior cases in (106), interpreted, across the board, as activities:

(103) a. this is a type of (new) reaching/finishing/discovering/exploding/erupting/arriving
b. yesterday’s (new) reaching/finishing/discovering/exploding/erupting/arriving

(104) a. summit reaching; task finishing; gold discovering; dynamite exploding; lava erupting
b. nighttime reaching; winter finishing; ocean discovering; morning erupting; summer arriving

(105) a. this is a type of (gold) discovery/ (summer) explosion/ (nighttime) eruption/ (winter) arrival
b. yesterday’s (gold) discovery/ (summer) explosion/ (nighttime) eruption/ (winter) arrival

(106) the (backyard) dropping; the (daytime) falling; the (winter) slipping; the (summer) dying; the (noon) whitening; the (evening) sinking

The homogeneity of ING, finally, translates within the area of R-ING nominals and Syn-Compounds, as within the area of AS-ING nominals, to a resistance to pluralization and to the numeral one. Yet again, no such effects are attested with R-ATK nominals or in simple event nominals in general:29

(107) a. These are types of (recent) *parentings/ *decidings/ *formulatings/ *bombings/ *replacings.
b. this century’s {*parentings/ *decidings/ *formulatings/ *terrorizings/ *replacings}
c. *one parenting; *one deciding; *one formulating; *one terrorizing; *one replacing

(108) a. *decision makings; *face liftings; *market globalizings; *civilian terroriz-ings; *road blockings
b. *winter flowerings; *nighttime bombings; *machine washings
c. *one road blocking; *one civilian terrorizing; *one shop lifting; *one machine washing

29 The indefinite article a is a solid test for count interpretation in DP contexts. However, as it does occur in mass predicates (John is a mess), it is avoided here.
These are types of (recent) decisions/ formulations/ replacements/ substitutions.

one decision; one formulation; one replacement; one substitution

yesterday’s behaviors/ concerts/ trips/ classes/ events/ weddings

one behavior; one concert; one trip; one class; one event; one wedding

Across its occurrences, then, nominalizing ING is a homogeneous event. In R-ING nominals and in Syn-Compounds, as in AS-ING nominals, what emerges is the exclusion of non-homogeneous event construal as well as the exclusion of count instantiations, none otherwise attested in either other simple event nominals or in AS-ATK nominals.30

12.6.3 R-ING entails an Originator

The case for the Originator entailment for AS-ING nominals was based, fundamentally, on the contrasts in (110)–(115) (see Chapter 4, section 5 for a detailed discussion). Specifically, note that the clausal cases in (110) and (112) are in principle ambiguous between a reading which entails an Originator and a reading which does not. The correlating AS-ING nominals in (111) and (113)–(114), however, are exclusively Originator-oriented. No such effects are attested for AS-ATK nominals, as (115) shows:31

(110) a. Dennis felt the coat. ([Involuntary) Experiencer; Originator]
   b. Jenny smelled the stew. ([Involuntary) Experiencer; Originator]
   c. Corrine touched Gil. ([Involuntary) Experiencer; Originator]
   d. The wall touched the fence. ([Involuntary) Experiencer contextually]

(111) a. Dennis’/the feeling of #the cold/the fabric [Originator reading only]
   b. Jenny’s/the smelling of the stew [Originator reading only]
   c. Corrine’s/the touching of Gil [Originator reading only]
   d. #the wall’s/the touching of the fence [Originator reading only]

(112) a. John irritated the dogs. a’. The clarinet irritated the cats.
   b. Mary annoyed the children. b’. The noise annoyed the children.
   c. The cats pleased Alexis and Bettina. c’. The music pleased Alexis and Bettina.

30 A few notable listed exceptions are feeling(s), reading(s) (under the ‘interpretation’ construal), misgivings (note the absence of a verbal source altogether, as well as the absence of a singular), belonging(s). I am assuming without further discussion that forms such as changeling, earthling, duckling, and dumpling as well as possibly inkling and twinkling (under the reduced reading) come with a LING diminutive suffix, rather than ING.

31 # assigned rather than * because e.g. a clarinet or a wall could be anthropomorphized and some chilly substance may be dubbed the cold. Readings that are marked here as # are thus those associated with deviance from the conventional Content assigned to the relevant items.
a. John’s irritating of the dogs  
  b. Mary’s annoying of the children  
  c. the cats’ pleasing of Alexis and Bettina

a’. #the clarinet’s irritating of the cats  
  b’. #the noise’s annoying of the children  
  c’. #the music’s pleasing of Alexis and Bettina.

a. the irritating of the dogs  
  b. the annoying of the children  
  c. the pleasing of Alexis and Bettina

[Originator reading only]

a. the wall’s (persistent) adherence/#adhering to the fence  
  b. Guy’s definitive knowledge/#knowing of all the answers  
  c. Ava’s (patient) endurance/#enduring of the noise  
  d. the stain’s (sad) resistance/#resisting to cleaning

Finally, AS-ING nominals are incompatible with weather predicates, the latter neither stative nor including an experiencer, but nonetheless devoid of an Originator:

a. *It’s (constant) raining in Utrecht (for several days)  
  b. *It’s (rare) snowing in Paris (for several hours)  
  c. *the (constant) raining in Utrecht (for several days)  
  d. *the (rare) snowing in Paris (for several hours)

With equal force, an Originator is required in Syn-Compounds as well as in bare R-ING. Note that for Syn-Compounds, the effects are equally valid with both argumental and adjunct construals of the non-head:

(117) Originator reading only, R-ING:
  a. this morning’s (unexpected) touching  
  b. yesterday’s (unexpected) smelling  
  c. this is a type of (new) pleasing

(118) Originator reading only, Syn-Compounds, “argument” non-head construal:
  a. this morning’s fence touching  
  b. yesterday’s stew smelling  
  c. this is a type of boss pleasing

(119) Originator reading only, Syn-Compounds, “adjunct” non-head construal:
  a. this morning’s spring touching  
  b. yesterday’s morning smelling  
  c. (?)this morning’s backyard irritating (for a purpose)  
  d. this is a type of front office pleasing

Nor are typical stative Contents possible (barring coercion), again in contrast with R-ATK nominals:

(120) a. #yesterday’s {adhering; persisting; enduring}  
  b. yesterday’s {adherence; persistence; endurance}  
  c. yesterday’s {annoyance; pleasure}
(121) “Argument” construal:
   a. #music admiring; #noise enduring; #stain resisting
   b. music admiration; noise endurance; stain resistance

(122) “Adjunct” construal:
   a. #bedtime enduring; #armchair resisting; #winter persisting; #school knowing
   b. bedtime endurance; armchair resistance; winter persistence; school knowledge

And finally, note the ungrammaticality of (123), once again contrasting with that of the bare nominals in (124), likewise “simple” events.32

(123) a. *this is a type of (severe) raining; *yesterday’s (harsh) snowing
   b. *midday raining; *winter snowing

(124) a. this is a type of (severe) rain; yesterday’s (harsh) snow
   b. midday rain; winter snow

Finally note that ER, by assumption with an OR function, is indeed barred with a non-Originator construal in Syn-Compounds as well as in bare R-nominals. Its exclusion in episodic cases with complements is predicted as well, of course, and is provided (but see fn. 24 for some exceptions):

(125) a. toucher; smeller; feeler; (active) resister; pleaser [Originator only]
   b. #knower; #resister (e.g. fabric); #persister; #endurer; #feeler (e.g. of the cold)
   c. #rainer; #snower

(126) a. fence toucher; stew smeller; coat feeler; stain resister; boss pleaser;
   b. morning toucher; evening smeller; backyard feeler; armchair resister; office pleaser
   c. #fact knower; #sick feeler; #sick looker; #stain resister (fabric); #noise endurer
   d. *August rainer; *morning snower

(127) Episodic ER with complements:
   a. a toucher of fences; a smeller of stew; a feeler of fabric; a resister of stains; a pleaser of authority
   b. #an endurer of noise; #a resister of stains (e.g. fabric); #a knower of facts
   c. *a rainer in August; *a snower in the morning

32 For completeness, note that no Originator effects are attested with zero “de-verbal” N cases, i.e. cases which are at times analyzed as involving a ò-affix, but which I argued at some length in Chapter 7 are in fact mono-morphemic roots contextually nominalized:

(i) a. This is a type of (new) touch. [ambiguous]
    b. Yesterday’s (unexpected) smell [favors Experiencer]
    c. a new jacket with a nice feel [ambiguous]
By way of concluding, we observed empirically that $\text{ING}_{N[V]}$ is homogeneous and entails an $\text{Originator}$. This observation generalizes to all its occurrences—in AS-nominals, in R-nominals, and in Syn-Compounds, of which only the first arguably comes with fully articulated grammatical event structure. Insofar as our account here crucially rests on $\text{ING}_{N[V]}$ being HOMOGENEOUS and taking an ORIGINATOR as its obligatory argument (the latter through the incorporation of virtual ER), the facts discussed in this section as well as in sections 4 and 5 of Chapter 4 fully corroborate these semantic claims.

12.7 Syn-Compounds: Structures, En-searches, and Other Relevant Matters

From the discussion in the previous sections it emerges that there is little reason to differentiate Syn-Compounds from so-called root compounds. Specifically, in the absence of grammatical event interpretation or any grammatical selection relationship between the head and the non-head, Syn-Compounds, just like root compounds, exhibit no evidence for functional syntactic complexity of any sort. Insofar as Syn-Compounds with $\text{ING}_{N[V]}$ are interpreted as simple events, I argued, this does not follow from the presence of grammatical event structure, but rather from the fact that $\text{ING}$ is HOMOGENEOUS, and that in its $\text{ING}_{N[V]}$ it includes an incorporated Originator.

In attempting to actually assign a syntactic structure to Syn-Compounds, suppose we take as our starting point the two structures in (53a–b), repeated here (with different root selection) as (128) (and see fn. 12 for some structural clarifications):

```
(128) a. \[ \begin{array}{cccc}
       & \text{ING/ER} & \text{ING/ER} & \text{ING/ER} \\
       & [\pi V_{\text{BALL}}] & [\pi V_{\text{FACE}}] & [C=V LIFT] \\
     \end{array} \]
```

The structure in (128a) is entirely straightforward, and is the structure typically assigned to, e.g., heart surgeon, tea merchant, or pastry chef, where the head, presumably, is not derived from a verb (and see, for this structure, Selkirk 1982, Di Sciullo and Williams 1987, and Lieber 2009, i.a.). Prima facie support for (128a) comes from the fact that as already noted in section 12.3.1, V-headed compounds do not typically occur in English (verb–particle compounds such as to black out being the exception).

Nonetheless, there are rather compelling reasons to adopt the structure in (128b): multiple factors point to the fact that in non-compositional Syn-Compounds, what is listed is an atomic Content unit which does not have the structure in (128a) or any of its sub-constituents, but rather that of the boxed constituent in (128b), bracketed, furthermore, as V (or V-equivalent). The ensuing discussion not only tips the scale in favor of the structure in (128b), but also provides independent
evidence for the specific claims made in this study about the relationship between syntactic complexity and compositionality, listedness, Content matching, and en-searching.

Consider again the paradigm in (50), repeated and augmented here as (129), and illustrating the presence of listed Content for Syn-Compounds which is not shared by V+Object clausal contexts:

(129)  
(a) warmongering warmonger(er) *to monger (a) war  
(b) time-serving time-server opportunist/ism (!)to serve time  
(c) babysitting babysitter *to sit (a) baby  
(d) line producing line producer film accountant/icy #to produce (a) line  
(e) crystal-gazing crystal-gazer fortune telling #to gaze (into) a crystal  
(f) facelifting facelifter #to lift (a) face  
(g) whistleblowing whistleblower #to blow whistle  
(h) shoplifting shoplifter #to lift shop  
i. typewriting typewriter #to write (a) type  
j. whitewashing whitewasher #to wash white

One of the striking facts about the list in (129) is that the non-compositional Content exists, in parallel, for both ING and ER Syn-Compounds, but cannot possibly be traced back to any relationship between a verb and its putative argument. Nor is the picture unique to English. Hebrew shows that very same pattern, with non-compositional Content for Syn-Compounds frequently patterning together across the equivalents of ER and ING, but missing in the clusal instantiations and in AS-nominals:33

(130)  
(a) ?orek din ?arikat din #?arak (’et ha.) din  
lit. editor law lit. editing law edited (om the) law ‘lawyer’ ‘lawyering’ lit. only  
(b) melaxek pinka lixuk pinka #lixek (’et ha.) pinka  
lit. chewer bowl lit. chewing bowl chewed (om the) bowl ‘boot licker’ ‘boot licking’ lit. only  
(c) ’obed ?ecot ’obdan ?ecot #’ibed (’et ha.) ?ecot  
lit. loser advice lit. loss advice lost (om the) advice ‘confused, helpless’ ‘confusion, helplessness’ lit. only

(131)  
(a) ha.?arika šel ha.din a’. ha.?orek šel ha.din  
the.editor of the.law the.editor of the.law ‘lawyer’ (lit. only) ‘lawyer’ (lit. only)  
(b) ha.lixuk šel ha.pinka b’. ha.melaxek šel ha.pinka  
the.chewing of the.bowl the.chewer of the.bowl ‘boot licking’ (lit. only) ‘boot licking’ (lit. only)

33 We note that if the analysis in the text is correct, then Hebrew, as well, involves a (possible) incorporation of an OR function into some nominalizers.
c. ha.obdan šel ha.¿ecot c'. ha.¿bed šel ha.¿ecot

the.loss of the.advice the.loser of the.advice

*‘confusion’ (lit. only) *‘confused’ (lit. only)

Under any account, the non-compositional Content in (50) and (129)–(130) must be listed. The question, however, is how many listings are involved. If we assume that the structure of Syn-Compounds is as in (128a), there is simply no constituent which e.g. shoplifter and shoplifting have in common, and thus the shared Content becomes a mere coincidence. Yet such a coincidence is rather hard to reconcile not only with the great frequency of such occurrences, but also with their cross-linguistic occurrence.

Similar logic in support of (128b) is pursued by Ackema and Neeleman (2004).34 Thus they observe the great frequency with which verbs that correspond to the affixless portion of (129), and similar cases comes to exist. (132) is a somewhat augmented partial list of their (partial) list:

(132) to babysit to whitewash to play-act
to shoplift to facelift to line produce
to bottom feed to carbon date to color code
to copy-edit to proofread to browbeat

Although Marchand (1969) concludes that N–V compounding in English must be allowed, he does note that forms such as those in (132) emerge as a result of “back formation”, a reanalysis process that effectively strips a compound such as baby-sitting of its affixal material, thereby turning it into a verb (see also Pennanen 1966). Among other factors, he dates the actual historical emergence (in print) of many of the complex verbs in (132) (e.g. 1947 for first attested verbal instantiation of babysit) to show that it postdates the existence of the correlating Synthetic Compound. Overall, he traces the emergence of complex verbs such as those in (132) from Syn-Compounds to a late trend in Modern English, starting sometime in the 19th century. In turn, and insofar as some non-compositional Syn-Compounds clearly existed, for however long, without a corresponding verbal form, and insofar as some of them still do, and especially in view of the fact that there are no cases, in English, of N–V compounds that do not have Syn-Compound correlates, it is clear that Syn-Compounds can and do exist such that their non-compositional Content does not correlate with that of an actually occurring verbal use and cannot be assumed to have such a verbal use as a source for their Content. Likewise, it strongly supports the diachronic claim that the emergence of the complex verbs in (132) is triggered by the prior existence of Syn-Compounds with that same non-compositional Content. The question, then, is how to structurally characterize Syn-Compounds in general and non-compositional Syn-Compounds in particular, such that they can plausibly give

34 Ackema and Neeleman’s architecture is fundamentally similar to (128), but they nonetheless assume the relevant structures to be associated with an independent morphological component. While I certainly endorse many of their architectural conclusions, I see little reason to exclude the relevant structures from the syntax. For the relevant review, see Chapter 6, section 1.
rise to the complex verbs in (132). If, indeed, “stripping”, however characterized, is involved; as noted explicitly by Ackema and Neeleman, it cannot possibly be stated for the structure in (128a), where neither the affix nor the surviving “stripped” remainder are a constituent. Thus even if the initial structure of Syn-Compounds is as in (128a), for “stripping” to apply the structure would need to first be reanalyzed to the structure in (128b), thereby, perforce, allowing that constituent structure into existence in the grammar of English one way or another.

But if we now adopt the structure in (128b), a puzzle emerges. As Ackema and Neeleman observe, cases such as those in (132) are virtually non-existent when compositional. English does not allow to truck drive or to window break or to tree prune or to paper write. But if the structure of Syn-Compounds, compositional as well as non-compositional, is as in (128b), the contrast is not easy to explain.35 Ackema and Neeleman themselves, arguing in favor of a structure like (128b) as well as in favor of N–V compounding in both English and Dutch, account for the effect as follows. First, they offer the generalization in (133). Second, to account for the obligatoriness of the additional morphological processes in the case of non-compositional N+V combinations, they appeal to competition and blocking. Effectively, to drive a truck wins over to truck drive. As e.g. *to sit a baby does not exist, to babysit is free, so to speak, to emerge without extra cost:

(133) N-V compounds that do not occur independently are licensed by a further morphological process of compounding […] or a further morphological process of derivation. (Ackema and Neeleman 2004, p. 58)

A competition between to truck drive and to drive a truck, as Ackema and Neeleman indeed note, crucially presupposes that in Syn-Compounds, the verbal nexus does assign a role to the non-head. It is precisely because the thematic relationship between drive and truck are identical in to drive a truck and to truck drive that the derivations can be compared. Presumably, no such role assignment occurs in the case of e.g. color code, as to color code and to code color are certainly not synonyms.36

35 And note in this context that e.g. proofread is not synonymous with to read proofs, nor is copy-edit synonymous with to edit a copy. To bartend and to handshake, as Ackema and Neeleman note, do appear to be genuine counter-examples, however.

The effect is even more striking in Dutch, which visibly allows N+V structures within complex compounds, as in (ia), but which, just like English, only allows the verbal correlates of non-compositional Syn-Compounds and blocks compositional ones, as in (ib):

(i) a. [N [v appel pluk] machine]
   apple pick machine
b. *de boerenknecht [appel plukt] de hele dag
   the farmhand ‘apple picks’ all day long (Ackema and Neeleman 2004, pp. 57–8, examples (12a), (15a))

36 Ackema and Neeleman remain somewhat vague on the relationship, if any, that holds between color and code in to color code. They note only that to color code allows an independent distinct internal argument, as in to color code the manuscript. The problem with this particular diagnostic, however, is that as already noted passim, and contrary to the FSP, it does not distinguish between non-compositional and compositional Syn-Compounds, and the latter allow direct objects as well (within AS-nominals),

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Insofar as the explanation proposed by Ackema and Neelman crucially hinges on (a lexical execution) of (13i), it is, in turn, subject to the criticism of all (13i)-based accounts already discussed in some detail in section 12.3. Nor is it clear how, exactly, competition should be framed so as to define to truck drive and to drive a truck as in competition, but not, say, the sinking of the ship vs. the ship’s sinking, or, for that matter, ship sinking.

Let us then consider an alternative. First, suppose we adopt a modified version of (133), which makes the embedding of N–V compounds obligatory, effectively making them, in the relevant sense, “bound” morphemes:

\[(134) \text{ N–V compounds (English, Dutch, Hebrew) are bound (and hence require further morphological processes of compounding or derivation).}\]

While for Ackema and Neeleman the task was to explain the cases in which N–V may not occur without affixation, the task here, as defined by the revised version in (134), is to show that in some important sense, the verbal forms in (132) are no longer true N–V compounds, and hence do not fall under the jurisdiction of (134).

As it turns out, in the system developed here, there is a crucial formal difference between Syn-Compounds such as truck driver/ing, window breaker/ing, and Syn-Compounds such as babysit/ing, crystal gazer/ing, or bottom feeder/ing. By definition, and because truck driver/ing is fully compositional, its overall Content is constructed on the basis of two distinct successful en-searches, returning two distinct atomic Content units. One of these searches returns DRIVE, the other returns TRUCK, and the combined Content is some combination of the two.\footnote{Note that in the absence of any functional structure, the combination of these two Contents cannot be semantic and is thus constrained solely by relevance and world knowledge, a result altogether appropriate for compounds. For a discussion of Content in the context of compounds, see Chapter 9, section 3.3 as well as Borer (2009, 2013).}

While an en-search consisting of \([/n\text{truck drive}]\) is, of course, licit in principle, there is simply no atomic Content unit on file to match this string, and so an en-search would return empty-handed. Not so \([/n\text{babysit}]\) or \([/n\text{facelift}]\), which can be successfully matched with an atomic Content unit, and where a single en-search can thus be successful, returning BABYSIT and FACELIFT respectively.

Recall now that all Content is assigned at the same time, on the basis of bracketed (and sometimes labeled) phonological representations. Crucially, en-searching, and thus atomic Content units, are entirely oblivious to the internal syntactic complexity providing the non-head is construed as manner. Insofar as color in to color code is interpreted as an adjunct, the generalization has little to do with atomic Content:

(i)

a. the fruit tree pruning of this rosebush
   \[\rightarrow\] to prune a rosebush in a manner appropriate for fruit trees

b. the Porsche driving of my ancient Volvo
   \[\rightarrow\] to drive my ancient Volvo in a manner appropriate for a Porsche

In turn, if code in color code is an adjunct, so clearly is Porsche in Porsche driving (my Volvo), thereby making the comparison between to Porsche drive and to drive a Porsche impossible and blocking irrelevant. The question then becomes, of course, why to Porsche drive remains such a marginal formation, when compared with to color code.
of the phonological representations which they match. As a result the spellouts of
(categorized) roots, by assumption non-branching terminals, are matched with
atomic Content units in the very same way as e.g. \( /_n\text{transformation}/ \), both involving
a single successful en-search. Insofar as FACELIFT is the product of a single
en-search, it is neither less nor more complex, Content-wise, than DANCE, but it
is less complex than the combination of TRUCK and DRIVE in which, perforce,
en-searching segmented the relevant string into two distinct bracketed components.

We note now that not only is FACELIFT an atomic Content unit of the very same
complexity (or lack thereof) as DANCE or TABLE, but the constituent which it
matches is specifically V, or more accurately, V-equivalent. Thus consider again the
structure in (128b) and specifically the instance of first Merge (boxed) involving
\( ^*_\text{LIFT} \) and \( ^*_\text{FACE} \). Neither one, note, has a category, nor is it obvious which one
will end up projecting. What is clear, however, is that once the boxed structure
merges with ING, it becomes V-equivalent (see Chapter 6, section 4 as well as section 5
of Chapter 10 for the relevant structural considerations). The emerging picture is,
then, that BABYSIT is an atomic Content unit complete with brackets, which is always
V-equivalent, and occurring only with C-functors that take V as their CCS. There is
little, it would appear, to distinguish it from bona fide V-equivalent roots, or, for that
matter, from non-compositional derived verbs such as \( /_n\text{liquidate}/ \). That it should
turn out to actually emerge overtly as a verb with its affixal material “stripped” is thus
a natural reanalysis. In fact, once Syn-Compounds such as those in (129) are in place,
the question must be why, at times (e.g. in the case of to facelift) the emergence of
such verbal existence is so delayed.\(^{38}\) In contrast, and although clearly \([ BALL \]
[ LIFT ]] is likewise a V-equivalent constituent, its diachronic cycling into a root-like
verb does not represent an equally natural extension of the system. If we return to the
structure in (128a), finally, we note that in the absence of a constituent that cor-
responds to \( /_n\text{facelift}/ \), en-searching would need to take as its input \( /_n\text{facelifter}/ \)
separately from \( /_n\text{facelifting}/ \), returning FACELIFTER and FACELIFTING, respect-
ively. Two such distinct en-searches are not only redundant, but also fail in a
fundamental way to capture the fact that the relationship between ING and
FACELIFT as well as the relationship between FACELIFT and ER are fully
compositional.\(^{39}\)

\(^{38}\) Note that given the categorial system developed here, we directly expect the eventual emergence of
the forms in (i):

(i) a babysit; a play-act; a proofread; a copy-edit; a skydive; a headhunt; etc.

\(^{39}\) Because ER may merge with N, note, a parallel derivation within the nominal domain is not excluded,
with the structure in (i). The matter, however, is extremely hard to illustrate because we take it for granted
that N+N compounds exist independently of any further possible affixation, and that as a consequence, no
"stripping" is ever required.

\( [ \text{atomic Content} ] \)
12.8 Conclusion

While the empirical focus of this chapter has been the comparison of AS-nominals and Syn-Compounds, from a broader perspective it bears on the division of labor between the lexicon and the syntax, and more specifically, on domains of rule application. In the broadest perspective, at the core of any lexical approach there is an assumption that some listed unit, however defined, is a syntactically atomic unit, but nonetheless a grammatically coherent domain which consists of an array of grammatical instructions to the syntax (as well as to the morphology and to the phonology). More narrowly, in all lexicalist accounts, however derived or executed, the relevant listed unit (may) include a specification of a privileged relationship that must hold between that unit and some other constituent, which may be syntactically, rather than lexically, realized: that is, an argument. The claim, as we saw, is not unique to so-called lexicalist accounts, but is also typical of a host of root-based approaches, which may dispense with listed categorial labels and lexical operations, but not with listed argument selection.

I have considered in this study three distinct instantiations of derived nominals—AS-nominals, R-nominals, and Syn-Compounds. I believe the conclusions of this investigation cast serious doubt on a number of claims concerning the properties of listed items as well as on the assumption that the lexicon is an appropriate domain for rule application which affects the syntax. First and foremost, I showed that identical morpho-phonological units, arguably phonological words, may nonetheless have an extremely different syntax. The different syntax under consideration was not associated just with the structure in which such “words” are embedded, or the structure which they may head, but rather, with their actual derivational history and their internal composition. The morpho-phonological unit lifting, specifically, has undergone considerably more derivational steps when occurring in the context of the lifting of the package, than it has in the context of the package lifting. The distinct derivational history, in turn, correlated directly with distinct broader syntax, with distinct formal semantic properties, and finally, with a very distinct degree of access to Content matching. Insofar as this point has been established, it argues strongly against correlating any phonological domain for rule application with a uniform syntactic structure, and argues extremely strongly for constructing complex words syntactically. In contextualizing it relative to treatments of words in the past decades, it argues extremely strongly against the Lexical Integrity Hypothesis of Lapointe (1980) as well as its latter day incarnation as the Atomicity Thesis in Di Sciullo and Williams (1987).

Beyond illustrating that words, internally, have syntactic constituent structure and thus must be syntactically constructed, I have argued explicitly against the listing of any syntactic relations, such as those which hold between a head and its arguments, be those heads categorized (e.g. as verbs) or roots. The generalized challenge to any such listing emerged from the direct correlation between the syntactic representation of arguments, the emergence of a grammatical event reading, and the emergence of a strictly compositional reading. Precisely because Syn-Compounds do not come with internal ExP-segments, they do not have (internal) grammatical
event representation; so that the non-head cannot, in actuality, be an argument (under any approach). It is for the very same reason, i.e. the absence of internal ExP-segments, that atomic Content may emerge, however. It is difficult to see how this result can be explanatorily reconciled with the listing of internal arguments, or any other arguments, for that matter.

Importantly, what has been provided is not an argument against listedness as such; nor do I believe in the existence of any such (valid) arguments. Any grammatical model which subscribes to the arbitrariness of the sound–meaning pair must have a list. Within the non-rigidly designating domain, what is clearly required are, indeed, two lists: one consisting of sound combinations, the other consisting of atomic Content units, and alongside these lists, some kind of pair-forming operation correlating a particular sound with a particular Content unit. The lexicon–syntax debate has never been about listedness, as such. It has been, and remains, a debate about what the content of the relevant lists is; specifically, what type of units inhabit the sound list, on the one hand, and what type of “Content” inhabits the Content list, on the other. The lexical answer has been, by and large, that the listed sound is equivalent to (some) phonological domain of rule application, and that the listed Content associated with it includes sufficient information to inform its appropriate syntactic merger, however derived. In contrast, the proposal I advance here is that the Content component is strictly encyclopedic and devoid of any direct grammatical significance.
Conclusion

In the past decade a consensus has emerged that variation, both intra-linguistic and inter-linguistic, should be reduced to the properties and the distribution of functional vocabulary, a thesis sometimes referred to as the Borer-Chomsky Conjecture. In terms of the system propounded in this study, such language variation should be reduced to the properties of functors. Even more narrowly, it is rather implausible to assume that the actual inventory of rigid designators may be radically distinct across different grammars. If that were the case, the notion of a biologically determined linguistic ability common to all members of the species would become, effectively, vacuous. Rather, and as noted already in Borer (1984), even within the area of functors, cross-linguistic variation should be narrowly limited so as to apply to what, nowadays, we would term realizational properties.¹ If we take realizational properties to refer, at the very least if not exclusively, to phonological information (or absence, thereof) then the inevitable conclusion is that the syntax and the phonology, or at the very least, the syntax and the mapping to phonological realization cannot be severed from each other. Insofar as languages do exhibit distinct syntactic configurations, and insofar as such distinct syntactic configurations are triggered by the phonological properties of functors, some manner of impact on syntactic derivation as associated with some facets of phonological realization, however represented, is inevitable.

In turn, the failure of any serious attempt to separate the syntax from the phonology has already been conceded in a variety of ways during the past decades, and in fact, beginning with Chomsky and Lasnik (1978), where the strict separation of LF and PF was first proposed. The guise which such failure of separation has typically taken, over the years, has been an appeal to the presence of two rather distinct (and ordered relative to each other) syntactic components; one which, using present-day terminology, we could refer to as “Narrow Syntax”, and which interacts with Logical Form and the Conceptual/Intensional interface, and the other which consists of “stylistic rules”, which, by assumption, apply after the LF/PF split, on the PF side of the model, and without an effect on Logical Form, but which may impact, for example, what in present-day terminology we might think of as “linearization”, but

¹ Thus in Borer (1984) grammatical formatives with a fixed function, e.g. case marking, may be inserted either prior to the PF–LF split, or alternatively in phonology, giving rise to different linearization, different constituent structure, and distinct phonological realizational properties.
which in fact impacts not only word order, but constituent order as well. And yet, as has been noted rather repeatedly during the years, finding “Stylistic Rules” or principles of linearization which truly obey different structural constraints from syntactic rules within Narrow Syntax or that truly impact no aspect of semantics and meaning, is not an easy matter. Is it, then, a good move to assume that there are, effectively, two syntactic components which may be structurally constrained in identical ways, but are nonetheless discrete and distinct?

The question, we note, is particularly relevant for any attempt to return morphological structure into the syntax. Quite apart from the crucial role which phonological representations must play in any such attempt, as already noted in Chapter 1 and in Chapter 8, morphological realizations, as such, never impact Logical Form. To be sure, e.g. ABLE has semantics, and so does PST. However, the specific manner in which ABLE composes with a base, e.g. as in edible or verbalizable, is semantically irrelevant. Similarly, the way in which PST is marked on a stem is irrelevant as well. A language which expresses PST through the binding of an empty value by an adverb of tense or by discourse (e.g. Haitian Creole; see Déchaine 1993b for the relevant discussion) is not semantically distinct from a language such as French, where PST is realized as a marking on a verb or a V-equivalent root. Insofar as modes of composition are used to combine together bound morphemes and insofar as particular realization modes apply to some forms of inflection (i.e. our S-marking), those, in and of themselves, never impact LF.

We hasten to note that the internal structure of complex words does have interpretational properties, and that crucially, scope can be computed within a complex word, and such scope is dependent on the syntactic derivational history of the complex word under consideration. In fact, it is exactly word-internal scope that provides one of the more important foundations for the claim that complex words are syntactic, most importantly in Baker (1985). Clearly, then, modes of composition for complex words do have ramifications. However, such ramifications are not driven, as such, by the specific morphemic nature or realization of the emerging combinations.

Suppose we consider a concrete illustration. In Chapter 6, section 4 I suggested that all complex words involve adjunction, emerging from a combination of reasons which involve projection determination and linearization. Such adjunction structure, I also suggested, is forced in the context of morphemic structure because of the min/max nature of the terminals. Clearly, however, neither scope nor any other aspect of interpretation is impacted by such adjunction, as the pre-adjunction structure has identical constituent structure and identical scope properties. What is impacted, rather, is primarily linearization. Adjunction, then, if so viewed, is “stylistic” in the relevant sense.

But if adjunction is “stylistic”, then we must conclude that not only the (output) structure of the R-nominal verbalization in (1) is stylistic in the relevant sense, but so is the structure of the AS-nominal verbalization, with the input to LF as in (2), and preceding all movement which does not impact LF in any way. But in this latter case, and as discussed in some detail in Chapters 9 and 10, a phase-based derivation is fairly crucial for the emergence of the relevant phonological and Content properties. Are we then to relegate phase-based movement to the stylistic component as well?
The alternative is, of course, to assume a single component of syntactic operations in which movement, or internal Merge, may be either free, subject to a converging derivation (in both LF and PF), or even more radically, to assume that phonological properties may drive internal Merge. The latter, we note, is a position taken in Zubizarreta (1998) where it is argued that movement may be driven by phonological constraints, and specifically, by the need to “strand” a focused constituent in the appropriate phonological domain for nuclear stress. This position is also presupposed in substantial sections of this book. The case of adjunction noted above already illustrates this point. Even more important, however, is the case of S-marking, where I suggested explicitly that the presence of an abstract S-functor results in head movement (and re-projection).

In an even more radical departure from standard claims regarding the interaction of phonology and syntax/LF, I claim that some aspects of meaning, and specifically Content, Frege’s Sinn, are not read off LF but off phonological representations. The rationale for that position, once presented (see Chapter 9, section 4), appears simply too straightforward to be denied. In (3), (3a) has a non-compositional, atomic Content, but (3b) and (3c) do not. And yet, in their compositional instantiation, they are effectively synonyms. It is extremely difficult to see how any model which does not allow for the interaction between phonological strings and Content, in some fashion, can capture this fact:

(3) Compositional Atomic Content

a. transmission TRANSMIT+N CAR GEARBOX
b. transmittal TRANSMIT+N ----
c. transmittance TRANSMIT+N ----

The picture that thus emerges from this study points to the need to articulate with much greater care what the grammatical role of phonology is relative to syntax and Content, and how, exactly, its interface with the syntax and with the Content-matching component, the en-search reader, should be modeled. At least some attempts in that direction have been made in this volume.

We note now that it goes without saying that actual phonological segments can hardly be the source of inter-language or intra-language variation. Whatever differences there may be between the syntax and the morphology of English and Hebrew,
they do not, presumably emerge from the fact that English uses /ɪːr/ whereas Hebrew uses /əvəred/. It is just as obvious, in turn, that whether a functor is phonologically overt or not does play a role, not only in the present work, but also in, for example, all accounts which subscribe to the view that phonologically null pronouns or phonologically null complementizers have different syntactic properties from overt ones. Finally, it goes without saying that if the overt vs. covert nature of some representation is syntactically significant, it is not prima facie obvious what the chain of causality is. Is it the covert nature of some functor that gives rise to a particular syntactic configuration, or is it, on the contrary, the nature of the syntactic configuration that results in a phonologically covert functor?

An example may be useful to illustrate this last point. Thus consider the phonologically null nature of PRO. According to most standard accounts within Government and Binding, PRO, by virtue of being phonologically null, does not need case, and for that reason, may occur in positions where such case is not available, e.g. subjects of infinitives and gerunds. Quite regardless of why PRO may need to be un governed within such models, we note that an appeal is made here to the claim that PRO has special syntactic properties by virtue of being phonologically null. In Minimalism, however, the account differs precisely in failing to attribute any direct grammatical properties to the phonologically null nature of PRO. Rather, the claim is that infinitives and gerunds place a particular condition on their subject (call it null case) which prevents it from being phonologically realized, the latter, note, quite possibly only relevant in PF. In turn, and as should be entirely clear from the above example, the actual chain of causality here is virtually impossible to fix. Is it the fact that PRO is inherently phonologically null that drives the consequent (possible) syntactic structure, or alternatively, is it some feature associated with gerunds or infinitives which, in PF, prevents the overt realization of PRO? Clearly, however, the choice between these two accounts, as it stands at present, is not an empirical issue, but rather is determined by overall theoretical considerations. If, as is typically assumed in Minimalism, the overt or null status of any given element cannot enter into the syntactic computation, the Government and Binding account must be rejected. What is entirely clear however is that the availability of PRO with its well-attested behavior does indicate some interaction between the syntax and the phonology. The mere existence of such interaction, however, does not favor, in itself, a particular chain of causal relations. Rather, any attempt to fix such a chain of causality must perforce proceed on the basis of a broader investigation of relevant cases, and in the hope that at least some of them might bear on the choice between these two accounts (or other imaginable ones).

On the basis of at least some of the results presented in this book, a preliminary model of the interaction between phonological realization and syntax is proposed. To recap some of the relevant properties: I defined a number of syntactic objects and attempted to elaborate on the way in which they interact with the syntax, with phonological realization, and with LF, where relevant. Two of these objects are reasonably straightforward, and their contrastive properties are given in (4)–(5):
(4) **Roots (notation: \( \pi^{\text{mm}} \)):**

- **Phonological properties:**
  
  An index in reference to a phonological information packet (potentially) controlling:
  
  a. root realization in context, including featural specification (S-marking)
  
  b. realization of functors, locally
  
  c. no realization clusters (i.e. no contingency relationship between the realization of different functors and/or S-marking)

- **Semantic properties:**
  
  NONE (no argument selection; no semantic classification of root type)

- **Syntactic properties:**
  
  NONE (no category; no selection frame)

- **Content:**
  
  NONE

(5) **C-Functors, syntactic rigid designators (notation: \( C_{x[y]} \)):**

- **Phonological properties:**
  
  a. need not have a phonological index
  
  i. Absent a phonological index, multiple realizations are possible for the same functor.
  
  ii. Distinct realizations are locally root selected, at times more than one per root.
  
  iii. In contexts that do not allow local root selection, the realization is a designated default.

  b. When it has a phonological index, it may constitute a “derivational realization class,” i.e. it may exhibit fixed realization clusters.

- **Syntactic properties:**
  
  a. Projects a category (at the very least N, V, A, and probably Adv as well).
  
  b. Defines a categorial complement Space (CCS) (at the very least N, V, A).

- **Semantic properties:**
  
  May, but need not, have a semantic function.

- **Content:**
  
  NONE

Relative to traditional functional structure and Extended Projections, the system developed here likewise makes explicit claims regarding phonological, syntactic, and semantic properties. Specifically, Extended Projections are defined as in (6):

(6) **Extended Projections:**

A. There must be a C-core such that it is dominated by all segments of the Extended Projection (ExP-segments).

B. The relative order of merger of (valued) ExP-segments within any Extended Projection (type) is universally specified.

C. Subject to A, every ExP-segment is optional, but its presence/absence has interpretational consequences.
Crucially, ExP-segments, in this approach, are themselves devoid of any inherent properties, and are rather null heads, instances of \( \ll e \gg \), which must be assigned range. Range is, in turn, assigned to them by S-functors, likewise instances of rigid designation, but this time a semantic one. Once assigned range, an instance of \( \ll e \gg \) is not only semantically valued, but the relevant semantic valuation effectively determines its projection possibilities. An Extended Projection, in turn, is a set of valued ExP-segments which all share the same CCS, Categorial Complement Space, and which is then associated with the C-core (\{Ex[X]\}).

The division of labor between these two elements is thus as follows:

<table>
<thead>
<tr>
<th>i. project</th>
<th>( \ll e \gg )</th>
<th>S-functor</th>
</tr>
</thead>
<tbody>
<tr>
<td>i. has a category</td>
<td>yes (derived)</td>
<td>no</td>
</tr>
<tr>
<td>i. has inherent semantics</td>
<td>no</td>
<td>yes</td>
</tr>
<tr>
<td>i. has a CCS</td>
<td>( \in [Ex[X]] )</td>
<td>no</td>
</tr>
</tbody>
</table>

The grammatical objects thus defined in this model are in turn composed in ways which, by and large, are relatively standard within Minimalism, with the derivation proceeding by phase, as is articulated in some detail in Chapter 10. Very little is said, in this study, about the workings of LF, even for those morphemes which I do assume to constitute valid LF objects, such as S-functors or some C-functors. Rather, I consider the main contribution of this work to be the putting in place of some typological observations and diagnostics, confirmed both in English and in Hebrew, such that they can serve as a starting point for more in-depth research into the outstanding wealth of phenomena that have only started to be revealed.

Importantly, and as in Borer (2005a, b), Content plays no grammatical role, and no syntactic objects are constructed on the basis of the lexical semantics of any items, words or roots. All aspects of structure and semantic interpretation (i.e. Bedeutung) are read off general organizational principles (e.g. scope) or are based on the rigid designation of functors, be they C-functors or S-functors. In Borer (2005a, b), I assumed the Content of roots to be syntactically and semantically unavailable, but I nonetheless did assume them to have Content. That specific assumption has been abandoned here, to be replaced by the claim that roots are altogether devoid of Content. While Content may be assigned to phonological strings which are coextensive with the root, the root, as such, has no privileged access to Content.

Insofar as Content, in this system, is read off qualifying phonological strings, and insofar as roots do not, in and of themselves, have Content, an important and non-trivial question arises with regard to the issue of relatedness. Under the assumption that, in the compositional reading of either liquidate or transformation, the Content of liquid and transform are fully accessible, it must be possible for our Content-matching system to access liquidate and transformation as complex, and to match content to liquid and to transform prior to (or independent of) the affixal material. It is precisely this factor that forces the cyclical, or phase-based, approach to Content matching and en-searching proposed in this study. In turn, and insofar as
the non-compositional Content of *liquidate* and *transformation* specifically does not match Content to *liquid* or *transform*, but rather to *liquidate* and *transformation* as a whole, the cycle/domain/phase of Content matching can clearly be extended, and within the internal domain Content must be allowed to be optional:

(8) A. *transformation*  
   Phase I  transform  $\rightarrow$ TRANSFORM  $\rightarrow$ $\emptyset$  
   Phase II  [[transform]ation]  $\rightarrow$ TRANSFORM+$C_{N[V]}$  $\rightarrow$ TRANSFORMATION  

B. *liquidate*  
   Phase I  liquid  $\rightarrow$ LIQUID  $\rightarrow$ $\emptyset$  
   Phase II  [[liquid]ate]  $\rightarrow$ LIQUID+$C_{V[N]}$  $\rightarrow$ LIQUIDATE  

In turn, however, and in one of the more important results of this study, the extension of the Content domain/phase is delimited by the presence of ExP-segments. While for the representations in (8), Content matching is possible either in Phase I or in Phase II, for the (post-adjunction) representation in (9), the only possible Content domain is the boxed one. The emerging result is the obligatory compositionality of AS-nominals vs. the optional compositionality of R-nominals:

(9) $\left[ N_\text{ExS} \left[ \text{transform} \right] \right]$  

Phase-based en-searching and Content matching, as developed in this work, receives its major support from a detailed study of derived nominals in both English and Hebrew. Some preliminary analyses suggesting its potential usefulness in the Hebrew verbal system are outlined in Chapter 11. On the whole, however, the system, as developed here primarily for derived nominals, should be viewed as a blueprint. The predictions are, within this domain, extremely explicit and are outlined in (10), and testing them is contingent on little beyond the development of relevant and useful tests for the internal structure of the relevant constituents:

(10) A. If a complex word has no internal ExP-segments (i.e. is a C-core), it may, in principle, correspond to either compositional or non-compositional Content, with the former computed by phase.  

B. If a complex word has internal ExP-segments, the C-core dominated by the ExP-segments may, in principle, correspond to either compositional or non-compositional Content. Beyond the merger with ExP-segments, however, the (phonological) root selection of the dominating C-functor is still possible, but Content must be compositional.  

As I noted already, we are fortunate in having available to us extremely detailed studies of derived nominals, allowing them to be modeled within such an approach with relative ease, both for nominals derived from verbs and nominals derived from
adjectives (CN[V] and CN[A]). We note, however, that in principle ExP-segments, involving event structure, degree, relational nouns, and others, could intervene between a C-core and some C-functor, giving rise to all the potential schemes in (11)–(12) (adjunction not marked; adverbs set aside):

\[
\begin{align*}
(11) & \quad \text{AS variants:} & \quad [x \ C_{A[V]}] & [E_{AS} \ [E_{AS} \ \{C=V \ C-core\}]] \\
& & [v \ C_{A[A]}] & [D_{EP} \ [E_{A} \ \{C=A \ C-core\}]] \quad \text{Ex-A – a member of \{Ex[A]\}} \\
& & [v \ C_{A[N]}] & [E_{N} \ [E_{N} \ \{C=N \ C-core\}]] \quad \text{Ex-N – a member of \{Ex[N]\}} \\
& & [a \ C_{A[v]}] & [E_{A} \ [A_{SPQ} \ \{C=V \ C-core\}]] \\
& & [a \ C_{A[N]}] & [E_{N} \ [E_{N} \ \{C=N \ C-core\}]] \\
& & [v \ C_{V[v]}] & [E_{V} \ [E_{V} \ \{C=V \ C-core\}]] \\
& & [a \ C_{A[A]}] & [D_{EP} \ [E_{A} \ \{C=A \ C-core\}]] \\
& & [a \ C_{N[N]}] & [E_{N} \ [E_{N} \ \{C=N \ C-core\}]]
\end{align*}
\]

\[
\begin{align*}
(12) & \quad \text{R variants:} & \quad a. [x \ C_{X[V]}] & \quad \{C=V \ C-core\} \\
& & [v \ C_{V[A]}] & \quad \{C=A \ C-core\} \\
& & [v \ C_{V[N]}] & \quad \{C=N \ C-core\} \\
& & [a \ C_{A[v]}] & \quad \{C=V \ C-core\} \\
& & [a \ C_{A[N]}] & \quad \{C=N \ C-core\} \\
& & [v \ C_{V[v]}] & \quad \{C=V \ C-core\} \\
& & [a \ C_{A[A]}] & \quad \{C=A \ C-core\} \\
& & [a \ C_{A[N]}] & \quad \{C=N \ C-core\} \\
& & [a \ C_{N[N]}] & \quad \{C=N \ C-core\}
\end{align*}
\]

In any and all such cases, and once the relevant presence of ExP-segments is established, one fully expects to find not only full compositionality for the AS cases in (11), but a potential compositionality alongside non-compositionality for its twin R variants in (12), presumably with identical phonological realization, but nonetheless with distinct overall properties and interpretation; those properties in turn should be able to distinguish not only non-compositional cases from compositional ones, but also the fully phrasal interpretation for the compositional cases in (11) when
contrasted with the compositional, but nonetheless perforce syntactically distinct, reading in (12a).

As in Borer (2005a, b), the system remains susceptible to one specific kind of criticism: that it over-generates, in predicting more regularity than is actually attested. We note, in this respect, that over-generation does not carry over to categorial labeling (a problem that plagues Distributed Morphology), but rather to the clearly incorrect prediction that any root, in a verbalizing context, could occur in any argumental configuration (a problem that similarly plagues Distributed Morphology). A tentative fix was already proposed in Borer (2005a, b), consisting of the claim that some terminals which may appear to be roots are actually more complex, representing the morphological incorporation of some functor, which is in turn responsible for delimiting the class of emerging possible configurations (see, specifically, Borer 2005b, Chapter 11, section 2.3, as well as Borer 2010). As the study of prefixes in English and in Romance progresses, we note, correlations between the occurrence of verbal prefixes and argumental configurations do emerge with a relatively compelling degree of regularity. The same, I submit, is true of studies of locatives. This said, over-generation does remain the biggest challenge facing neo-constructionist models across the board. The move to the lexicon in the 1970s was, to begin with, motivated by the great challenge facing any attempt to predict, in particular, argument structure constellations. The wealth of observations on verbal behavior that has emerged as a result of decades of studies thus focused has certainly succeeded in revealing the magnitude of the problem. Any one study such as this can only hope to make so much progress in attempting to blaze some trails through the lexicalist jungle. It is to be hoped, paraphrasing Chomsky (2012), in turn quoting Reuland (2011), that the system put forward here, while clearly too flawed to be true, is nonetheless too promising to be false.
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