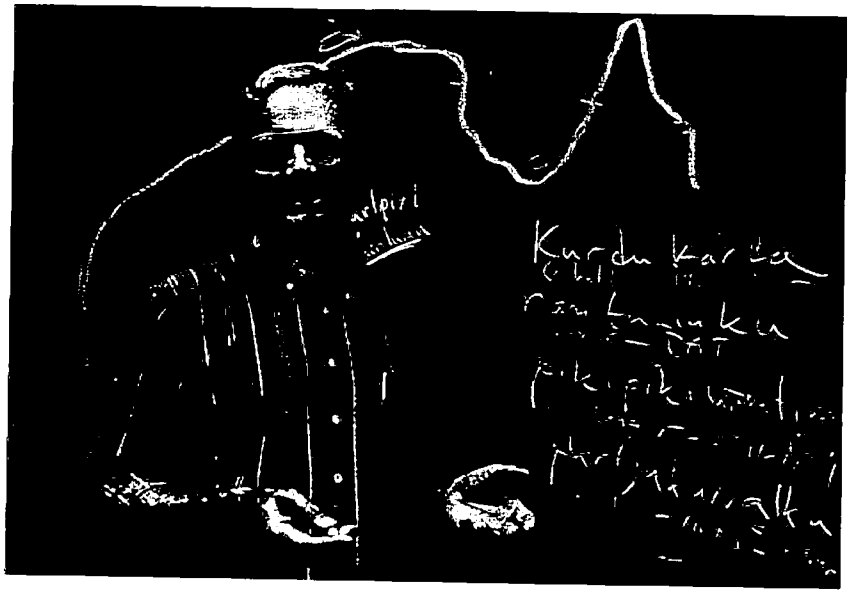

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## A Life in Language

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# Chapter 1

## Derivation by Phase

Noam Chomsky

What follows extends and revises an earlier paper ("Minimalist Inquiries," MI),[1] which outlines a framework for pursuit of the so-called Minimalist Program, one of a number of alternatives that are currently being explored. The shared goal is to formulate in a clear and useful way—and to the extent possible to answer—a fundamental question of the study of language, which until recently could hardly be considered seriously and may still be premature: to what extent is the human faculty of language FL an optimal solution to minimal design specifications, conditions that must be satisfied for language to be usable at all? We may think of these specifications as "legibility conditions": for each language L (a state of FL), the expressions generated by L must be "legible" to systems that access these objects at the interface between FL and external systems—external to FL, internal to the person.

The strongest minimalist thesis SMT would hold that language is an optimal solution to such conditions. The SMT, or a weaker version, becomes an empirical thesis insofar as we are able to determine interface conditions and to clarify notions of "good design." While the SMT cannot be seriously entertained, there is by now reason to believe that in nontrivial respects some such thesis holds, a surprising conclusion insofar as it is true, with broad implications for the study of language, and well beyond.

Note the indefinite article: *an* optimal solution. "Good design" conditions are in part a matter of empirical discovery, though within general guidelines of an a prioristic character, a familiar feature of rational inquiry. In the early days of the modern scientific revolution, for example, there was much concern about the interplay of experiment and mathematical reasoning in determining the nature of the world. Even the most extreme proponents of deductive reasoning from first principles, Descartes

for example, held that experiment was critically necessary to discover which of the reasonable options was instantiated in the actual world. Similar issues arise in the case at hand (see MI for discussion).

Tenable or not, the SMT sets an appropriate standard for true explanation: anything that falls short is to that extent descriptive, introducing mechanisms that would not be found in a "more perfect" system satisfying only legibility conditions. If empirical evidence requires mechanisms that are "imperfections," they call for some independent account: perhaps path-dependent evolutionary history, properties of the brain, or some other source. It is worthwhile to keep this standard of explanation in mind whether or not some version of a minimalist thesis turns out to be valid.

These considerations bear directly on parametric variation, in this case yielding conclusions that are familiar features of linguistic inquiry. Any such variation is a prima facie imperfection: one seeks to restrict the variety for this reason alone. The same goal is grounded in independent concerns of explanatory adequacy/learnability, which require further that ineliminable parameters be easily detectable in data available for language acquisition. Both kinds of considerations (related, though distinct) indicate that study of language should be guided by the *Uniformity Principle* (1).

(1) In the absence of compelling evidence to the contrary, assume languages to be uniform, with variety restricted to easily detectable properties of utterances.

One familiar application is the thesis that basic inflectional properties are universal though phonetically manifested in various ways (or not at all), stimulated by Jean-Roger Vergnaud's influential Case-theoretic proposals 20 years ago. Another is the thesis proposed by Hagit Borer and others that parametric variation is restricted to the lexicon, and insofar as syntactic computation is concerned, to a narrow category of morphological properties, primarily inflectional. These have been highly productive guidelines for research, extending earlier efforts with similar motivation (e.g., efforts to reduce the variety of phrase structure and transformational rules). What counts as "compelling" is, of course, a matter of judgment: there is no algorithm to determine when apparently disconfirming evidence is real or is the effect of unknown factors, hence to be held in abeyance.

On such grounds, we try to eliminate levels apart from the interface levels, and to maintain a bare phrase structure theory and the *Inclusiveness Condition*, which bars introduction of new elements (features) in the course of computation: indices, traces, syntactic categories or bar levels, and so on. The indispensable operation of a recursive system is Merge (or some variant of it), which takes two syntactic objects $\alpha$ and $\beta$ and forms the new object $\gamma = \{\alpha, \beta\}$. We assume further that $\gamma$ is of some determinate type: it has label $LB(\gamma)$. In the best case, $LB(\gamma) = LB(\alpha)$ or $LB(\beta)$, determined by general algorithm.[2] Merge yields the relation Immediately-Contain (IC) (equivalently, Is-a-Member-Of), holding of $(\gamma, \alpha)$ and $(\gamma, \beta)$. Iterated Merge, required in any recursive system, yields Contain (equivalently, Term-Of). Arguably Merge also yields a relation between $\alpha$ and $\beta$ (sister): transitive closure yields C-Command (and also Contain and Identity, presumably available independently).



While (iterated) Merge "comes free," any other operation requires justification. Similarly, any features of lexical items that are not interpretable at the interface require justification. That includes most (maybe all) phonological features; these must be deleted or converted to interface-interpretable form by the phonological component. One might ask to what extent the phonological component is an optimal solution to the requirement of relating syntactic input to legible form, a hard question, not yet seriously addressed. We keep here to *narrow syntax*: computation of LF.

The empirical facts make it clear that there are (LF-)uninterpretable inflectional features that enter into agreement relations with interpretable inflectional features. Thus, the $\phi$-features of T (Tense)[3] are uninterpretable and agree with the interpretable $\phi$-features of a nominal that may be local or remote, yielding the surface effect of noun-verb agreement. The obvious conclusion, which we adopt, is that the agreement relation removes the uninterpretable features from the narrow syntax, allowing derivations to converge at LF while remaining intact for the phonological component (with language-variant PF manifestation).

We therefore have a relation Agree holding between $\alpha$ and $\beta$, where $\alpha$ has interpretable inflectional features and $\beta$ has uninterpretable ones, which delete under Agree. The relation Agree and uninterpretable features are prima facie imperfections. In MI and earlier work, it is suggested that both may be part of an optimal solution to minimal design specifications by virtue of their role in establishing the property of "displacement," which has (at least plausible) external motivation in terms of distinct kinds of semantic interpretation and perhaps processing. If so, displacement is only an apparent imperfection of natural language, as are the devices that implement it.

Displacement is implemented by selecting a target P and a related category K to be moved to a position determined by P–P a *probe* that seeks K.[4] The target/probe P determines the kind of category that can be moved to this position (a nominal phrase, a *wh*-phrase, etc.). If uninterpretable inflectional features are the devices that implement displacement, we expect to find uninterpretable features of three kinds:

(2) a. To select a target/probe P and determine what kind of category K it seeks
b. To determine whether P offers a position for movement
c. To select the category K that is moved

That seems correct. For movement of a nominal to T, for example, the ϕ-set and EPP-feature of T serve the functions (2a) and (2b), respectively.[5] The category K that is moved has uninterpretable structural Case, serving the function (2c). Agree is the relation between T and the moved category—more precisely, their relevant subparts.[6] Let us say that the uninterpretable features of P and K render their relevant subparts *active*, so that matching leads to agreement. Locality conditions yield an intervention effect if probe P matches inactive K that is closer to P than matching M, barring Agree(P, M), properties that may be nuanced, as we will see.

The picture seems to generalize over an interesting range. To the extent that this is true, uninterpretable features and the Agree relation are not true "imperfections," despite appearances.

Uninterpretability of features—say, of phonological features, ϕ-features of T or its EPP-feature, or structural Case—is not "stipulated." The existence of these features is a question of fact: does L have these properties or not? If it does (as appears to be the case), we have to recognize the fact and seek to explain it: in the best case, by showing that these are only apparent imperfections, part of an optimal solution to design specifications. Though motivated at the interface, interpretability of a feature is an inherent property that is accessible throughout the derivation. The phonological properties [±continuant], for example, are motivated only at the interface, but these "abstract" features are accessible throughout the derivation, which ultimately eliminates them in favor of narrow phonetic features interpretable at the interface. Similarly, interpretability of ϕ-features ([+] for N, [−] for T) is accessible throughout the derivation. For convergence, uninterpretable features must be deleted—in narrow syntax, we assume, by the operation Agree, establishing an agreement relation under appropriate conditions.



Suppose that L has generated the syntactic object K with label LB(K). On minimalist assumptions, LB(K) is the only element of K that is immediately accessible to L, so LB(K) must be the element that activates Agree, by virtue of its uninterpretable features: it is these that constitute the probe that seeks a matching *goal*—another collection of features—within the domain of LB(K). What is the relation Match? The optimal candidate is Identity; we therefore take Match to be Identity.

Interpretability of features is determined in the lexicon, by Universal Grammar (UG) we assume, and the distinction must be indicated not only at that stage but throughout the derivation. The natural principle is that the uninterpretable features, and only these, enter the derivation without values, and are distinguished from interpretable features by virtue of this property. Their values are determined by Agree, at which point the features must be deleted from the narrow syntax (or they will be indistinguishable from interpretable features at LF) but left available for the phonology (since they may have phonetic effects). The conclusion is appropriate in other respects: the values of uninterpretable features are redundant, and there is empirical motivation from intervention effects (see MI). Accordingly, Match is not strictly speaking Identity, but Non-distinctness: same feature, independently of value.

The operation Spell-Out removes LF-uninterpretable material from the syntactic object K and transfers K to the phonological component. It must therefore be able to determine which syntactic features are uninterpretable, hence to be removed. Prior to application of Agree, these are distinguished from interpretable features by lack of specification of value. After application of Agree, the distinction is lost. To operate without reconstructing the derivation,[7] Spell-Out must therefore apply shortly after the uninterpretable features have been assigned values (if they have not been assigned values at this point, the derivation will crash, with uninterpretable features at the interface). Spell-Out must be strongly cyclic (as assumed in MI). The conclusion, which follows naturally from examination of feature interpretability, has other desirable consequences. In contrast to Extended Standard Theory–based systems, this system has no overt/covert distinction with two independent cycles; rather, it has a single narrow-syntactic cycle. Furthermore, the phonological cycle is not a third independent cycle, but proceeds essentially in parallel.

I will keep here largely to Case/agreement and related systems: ϕ-features, structural Case, EPP, A-movement, and the *core functional categories* T, C, *v* (T = tense, C = complementizer, *v* = a light verb that introduces verbal phrases).[8] Within these systems, probe and goal match if features have values for the goal but not for the probe: if ϕ-features were valued for the probe, it would be inactive and could drive no operation; if they were unvalued for the goal, they would receive no values from the (unvalued) matching features of the probe. If correct, the analysis should generalize to other core syntactic processes. Some extensions to *wh*-movement are suggested in MI, but tentatively, for reasons indicated. This is the easiest case of Ā-movement, since there are grounds to believe that features of probe and goal are involved. In other cases (e.g., topicalization, VP-fronting), postulation of features is much more stipulative; and throughout, questions arise about intermediate stages of successive-cyclic Ā-movement and island conditions.

Matching of probe and goal induces Agree, eliminating uninterpretable features that activate them. A number of questions arise—specifically, with regard to the theses in (3).

(3) a. Goal as well as probe must be active for Agree to apply.
b. α must have a complete set of ϕ-features (it must be ϕ-*complete*) to delete uninterpretable features of the paired matching element β.

Let us tentatively adopt both theses, returning to the matter.[9]

For the Case/agreement systems, the uninterpretable features are ϕ-features of the probe and structural Case of the goal N. ϕ-features of N are interpretable; hence, N is active only when it has structural Case. Once the Case value is determined, N no longer enters into agreement relations and is "frozen in place" (under (3a)). Structural Case is not a feature of the probes (T, *v*), but it is assigned a value under agreement, then removed by Spell-Out from the narrow syntax. The value assigned depends on the probe: nominative for T, accusative for *v* (alternatively ergative-absolutive, with different conditions). Case itself is not matched, but deletes under matching of ϕ-features.

In some cases, an active element E is unable to inactivate a matched element by deleting its unvalued features. E is *defective*, differing in some respect from otherwise identical active elements that induce deletion. The simplest way to express the distinction, requiring no new mechanisms or features, is in terms of (3b): a nondefective probe is ϕ-complete, a defective one is not.



One case, to which we will return, is participle-object constructions, which may manifest partial ϕ-feature agreement but without Case assignment to the object, the participle being defective. Other cases, we will assume, are raising constructions and their exceptional-Case-marking (ECM) counterparts, as shown schematically in (4a), where β is the matrix clause, α is an infinitival with YP a verbal phrase (the case most relevant here), and P is the probe: T with a raising verb (case (4b)), *v* with an ECM transitive verb (case (4c)).[10]

(4) a. $[_{\beta}\ P\ [_{\alpha}\ [Subj\ [H\ YP]]]]$
b. i. there are likely to be awarded several prizes
ii. several prizes are likely to be awarded
c. i. we expect there to be awarded several prizes
ii. we expect several prizes to be awarded

The Case/agreement properties of Subj in (4a), and its overt location, are determined by properties of the matrix probe P, not internally to α. α is a TP with defective head $T_{def}$, which is unable to determine Case/agreement but has an EPP-feature, overtly manifested in (4c). Raising-ECM parallels give good reason to believe that the EPP-feature is manifested in (4b) as well, by trace of the matrix subject: preference for Merge over (more complex) Move gives a plausible reason for the surface distinction between [Spec, $T_{def}$] in (4b) and in (4c) (see MI). In (4bi) and (4ci), the EPP-feature of $T_{def}$ is satisfied by Merge of expletive; in (4bii) and (4cii), by raising of the direct object.

At this point, there are several ways to proceed.

Alternative 1, the conventional approach adopted in MI (and below), follows the path just outlined. [Spec, $T_{def}$] of α is filled either by Merge or by Move, then associated to the higher probe. Examples (4bii) and (4cii) illustrate raising to subject, leaving reconstruction sites.[11] $T_{def}$ matches Subj in some of its features (to implement raising) but not all (to preclude inactivation). If P and $T_{def}$ match Subj in the feature [person], then categories with this feature, and only these, can undergo raising (nominals but not adjectivals); on the simplest assumptions, $T_{def}$ has no other ϕ-features. Expletives too must have the feature [person], since they raise; and pure expletives of the *there*-type should have no other formal features, on the simplest assumptions. In a framework that dispenses with categorial features, as is reasonable on minimalist grounds, [person] plays the role formerly assigned to D- or N-features.[12]

When ϕ-complete, T values and deletes structural Case for N. The ϕ-set of N (which is always ϕ-complete) both values and deletes the ϕ-features of T (with or without movement). With a defective probe, agreement is not manifested and Case of the matched goal is not assigned a value: raising T exhibits no agreement, and participles lack person; neither determines the Case of matched N, which depends on a higher non-defective probe, T or *v* (see (18)).

Similar properties hold in other constructions, such as attributive adjectival/participial constructions ([*old/smashed*] *car*, *a car* [*old enough to buy/smashed into pieces*]). Whatever the correct analysis may be, these constructions involve a relation between N and the head of the predicate phrase; the complete ϕ-set of N values and deletes the matched uninterpretable features of the predicate, but the partial ϕ-set of the predicate does not value and delete Case in N, which still has to satisfy the Case Filter.

In the MI framework, C is one-to-one associated with ϕ-complete T ($T_{comp}$).

(5) C selects $T_{comp}$; V selects $T_{def}$.

Control structures and finite clauses have the selectional relation C-$T_{comp}$, while raising/ECM constructions have the relation V-$T_{def}$. The reasons given in MI were largely theory-internal, having to do with Case/agreement and related systems. The conclusions are consistent with those reached on other grounds. The earliest straightforward evidence that raising clauses fall together with finite TP, and control clauses with CP, was provided by Luigi Rizzi, who observed that control clauses, like CPs, are phonetically isolable in ways that raising clauses—and of course finite TP (stranding its complementizer)—are not.[13]

These conclusions suggest a possible recasting of the account of defective elements, alternative (2), with the invariant property (6).[14]

(6) C is ϕ-complete; T is ϕ-complete only when necessary.

One case in which T must be ϕ-complete, it could be argued, is selection by ϕ-complete α with uninterpretable features (specifically, α = C). The selectional property could then be formulated in terms of Match/Agree: the ϕ-features of α have to be deleted under Agree by T, which therefore must be ϕ-complete (crash with failure of match is detectable at once); we will return to some problems. It is tempting to associate EPP with ϕ-completeness: C, and T selected by C, are ϕ-complete and therefore allow



an EPP-feature; $T_{def}$ cannot have an EPP-feature. Accordingly, there is no internal raising to [Spec, $T_{def}$]; raising takes place "in one fell swoop" in such constructions as (4b), and there are no intermediate reconstruction sites.[15] Case/agreement and EPP proceed as before, with $T_{comp}$.

The symmetry of raising and ECM constructions suggests that the analysis should be extended to the latter as well.[16] Just as $C_{comp}$ selects $T_{comp}$, we might expect $v_{comp}$ (= *v**; see note 8) to select $V_{comp}$. Being ϕ-complete, C must select $T_{comp}$ for its unvalued features to delete under Match/Agree, and it allows an EPP-feature. For the same reasons, *v** selects $V_{comp}$ and allows an EPP-feature.

Continuing with alternative 2, unless selected by C or *v**, T and V are defective (raising T and passive/unaccusative V, respectively). They do not enter into Case/agreement and have no EPP-feature. When selected by C or *v**, T and V are ϕ-complete, entering into Case/agreement structures (with raising of associate or not, depending on optionality of the permitted EPP-feature and availability of alternatives to satisfy it). In a transitive construction, the object agrees with V and is assigned accusative Case (raising to [Spec, V] if V has an EPP-feature). There is no internal raising to [Spec, $T_{def}$] in raising or ECM constructions.[17]

Consider ECM constructions more closely, under alternative 2. The verbal phrase is *v*-[V-TP]. If the light verb *v* is ϕ-incomplete (passive), then V is defective, as is $T_V$ selected by V (in raising/ECM constructions). If *v* = *v**, then V must be ϕ-complete for convergence. But (6) does not require that $T_V$ be ϕ-complete in this case, because the ϕ-set of V is valued and deleted independently by the embedded subject. Therefore, T remains defective, and the raising/ECM parallelism remains intact.

The discussion suggests that T should be construed as a substantive rather than a functional category, falling together with N and V, and perhaps others, a possibility that is neutral between alternatives 1 and 2. We can regard T as the locus of tense/event structure (see note 8). The C-T relation is therefore analogous to the *v**-V relation.

Alternative 1 takes the locus of Case/agreement/EPP to be T, *v**; alternative 2 takes it to be T, V. Let us refer to the two alternatives as $Locus_{Tv^*}$ and $Locus_{TV}$, focusing on their basic conceptual difference: the choice of category relevant to Case/agreement/EPP. Much of what follows is neutral among these alternatives or variants that merit consideration as well.[18] I will continue with the conventional choice $Locus_{Tv^*}$, returning to others where appropriate, along with lingering problems.

Suppose that the label LB(K) of K has an uninterpretable selectional feature (by definition, an EPP-feature), which requires Merge in [Spec, LB(K)]. That can be satisfied by Merge of an expletive, in which case long-distance agreement may hold between LB(K) and the goal. Alternatively, an active goal G determines a category PP(G) (pied-piping), which is merged in [Spec, LB(K)], yielding the displacement property; long-distance agreement may still appear, if PP(G) fails to satisfy the $\phi$-features of the probe (e.g., quirky Case subject). The combination of Agree/pied-piping/Merge is the composite operation Move, preempted where possible by the simpler operations Merge and Agree.[19]

FL specifies the features F that are available to fix each particular language L. The MI framework takes L to be a derivational procedure that maps F to {Exp}, where an expression Exp is a set of interface representations. As a first approximation, take Exp to be {PF, LF}, these being symbolic objects at the sensorimotor and conceptual-intentional interfaces, respectively. We adopt the conventional assumption that L makes a one-time selection $[F_L]$ from F. These are the features that enter into L; others can be disregarded in use of L.

Assume further that L assembles $[F_L]$ to lexical items LI of a lexicon Lex, the LIs then entering into computations as units. In the simplest case, Lex is a single collection, but empirical phenomena might call for "distribution" of Lex, with late insertion in the manner of Distributed Morphology (DM).[20] In any case, we can think of Lex as in principle "Bloomfieldian," a "list of exceptions" that provides just the information required to yield the interface outputs and does so in the best way, with least redundancy and complication. In the simplest case, the entry LI is a once-and-for-all collection (perhaps structured) of (A) phonological, (B) semantic, and (C) formal features. The features of (A) are accessed in the phonological component, ultimately yielding a PF interface representation; those of (B) are interpreted at LF; and those of (C) are accessible in the course of the narrow-syntactic derivation. Language design is such that (B) and (C) intersect and are disjoint from (A), though there is some evidence, to which we will return, that presence or absence of features of (A) can have an effect on narrow-syntactic computation. It also seems that FL may retain something like (B)–(C) and the narrow syntax into which they enter while the phonological component is replaced by other means of sensorimotor access to narrow-syntactic derivations, as in sign language. Of particular interest is the subset of (C) that is not in (B): uninterpretable formal features that appear, prima facie, to violate conditions of optimal design.



For open classes, the simplest picture seems reasonable: LI is a unitary collection, including the phonological matrix. Lex is distributed when departure from the simplest account is warranted in favor of late insertion, typically for inflectional elements and suppletion. Throughout, answers depend on predictability of phonetic outcome by general phonological principles that satisfy UG conditions, and in all cases, the simplest choice should win. For roots and highly predictable inflectional elements (say, English progressive), the distinctions between single-LI and several independent contributions to LI (as in DM systems postulating universal late insertion) seem to have little empirical content, but they might, for example, when an idiosyncratic feature F of a root has syntactic effects. Universal late insertion then requires postulation of a redundant syntactic feature F′ as a "placeholder" in narrow syntax for F, with a stipulation that F′ must be replaced under late insertion by a root with F (i.e., F′ is effectively identical with F).[21] A unitary Lex avoids the redundancy and stipulation. The substantive results of DM remain unchanged.

Narrow syntax maps a selection of choices from Lex to LF; the phonological component, in contrast, has further access to $[F_L]$. Like the extraction of $[F_L]$ from F, these assumptions, largely conventional, reduce the computational burden for the procedure L while adding new conceptual apparatus.

More controversially, MI extends the same reasoning to individual derivations: L makes a one-time selection of a lexical array LA, a collection of LIs (a "numeration" if some are selected more than once), and maps LA to Exp. Again, there is a reduction of computational burden, in this case a vast reduction, since Lex, which virtually exhausts L, need no longer be accessed in the derivation once LA is selected. The new concept LA (numeration) is added, while another concept is eliminated: chains are determined by identity, with no need for indices or some similar device to distinguish chains from repetitions, also violating the Inclusiveness Condition. As in the other cases, the tests are ultimately empirical; on purely conceptual grounds, one could argue either way. As noted, the nature of optimal design that is instantiated in FL (if any) is a matter of discovery, within certain guidelines.

Proceeding further, MI proposes another reduction of computational burden: the derivation of Exp proceeds by *phase*, where each phase is

determined by a subarray $LA_i$ of LA, placed in "active memory." When the computation L exhausts $LA_i$, forming the syntactic object K, L returns to LA, either extending K to K′ or forming an independent structure M to be assimilated later to K or to some extension of K. Derivation is assumed to be strictly cyclic, but with the phase level of the cycle playing a special role.[22]

A subarray $LA_i$ must be easily identifiable; optimally, it should contain exactly one lexical item that will label the resulting phase. The evidence reviewed in MI suggested that the phases are "propositional": verbal phrases with full argument structure and CP with force indicators, but not TP alone or "weak" verbal configurations lacking external arguments (passive, unaccusative). Assume that substantive categories are selected by functional categories: V by a light verb, T by C. If so, phases are CP and *v**P, and a subarray contains exactly one C or *v**.

The choice of phases has independent support: these are reconstruction sites, and they have a degree of phonetic independence (as already noted for CP vs. TP). The same is true of *v*P constructions generally, not just *v**P.[23] If these too are phases, then PF and LF integrity correlate more generally.

Suppose, then, we take CP and *v*P to be phases. Nonetheless, there remains an important distinction between CP/*v**P phases and others; call the former *strong* phases and the latter *weak*. The strong phases are potential targets for movement; C and *v** may have an EPP-feature, which provides a position for XP-movement, and the observation can be generalized to head movement of the kind relevant here.[24]

The special role of strong phases becomes significant in the light of another suggestion of MI that I will adopt and extend here: cyclic Spell-Out, necessary for reasons already discussed, takes place at the strong phase level. The intuitive idea, to be sharpened, is that features deleted within the cyclic computation remain until the strong phase level, at which point the whole phase is "handed over" to the phonological component. The deleted features then disappear from the narrow syntax, allowing convergence at LF, but they may have phonetic effects.

Spell-Out seeks formal features that are uninterpretable but have been assigned values (checked); these are removed from the narrow syntax as the syntactic object is transferred to the phonology. The valued uninterpretable features can be detected with only limited inspection of the derivation if earlier stages of the cycle can be "forgotten"—in phase terms, if earlier phases need not be inspected. The computational burden is further



reduced if the phonological component too can "forget" earlier stages of derivation. These results follow from the Phase-Impenetrability Condition (PIC) (MI, (21)), for strong phase HP with head H,

(7) The domain of H is not accessible to operations outside HP; only H and its *edge* are accessible to such operations.

the *edge* being the residue outside of H′, either specifiers (Specs) or elements adjoined to HP.

H and its edge are accessible only up to the next strong phase, under the PIC: in (8), elements of HP are accessible to operations within the smallest strong ZP phase but not beyond.

(8) $[_{ZP}\ Z \ldots [_{HP}\ \alpha\ [H\ YP]]]$

Local head movement and successive-cyclic A- and Ā-movement are allowed, and both Spell-Out and the phonological component can proceed without checking back to earlier stages. The simplest assumption is that the phonological component spells out elements that undergo no further displacement—the heads of chains—with no need for further specification.[25]

In effect, H and its edge α in (8) belong to ZP for the purposes of Spell-Out, under the PIC. YP is spelled out at the level HP. H and α are spelled out if they remain in situ. Otherwise, their status is determined in the same way at the next strong phase ZP. The question arises only for the edge α, assuming that excorporation is disallowed.

The picture improves further if interpretation/evaluation takes place uniformly at the next higher phase, with Spell-Out just a special case. Assuming so, we adopt the guiding principle (9) for phases $Ph_i$.

(9) $Ph_1$ is interpreted/evaluated at the next relevant phase $Ph_2$.

What are the relevant phases? As noted, because of the availability of EPP, the effects of Spell-Out are determined at the next higher *strong* phase: CP or *v**P. For the same reason, a strong-phase HP allows extraction to its outer edge, so the domain of H can be assumed to be inaccessible to extraction under the PIC: an element to be extracted can be raised to the edge, and the operations of the phonological component can apply to the domain at once, not waiting for the next phase. Keeping to the optimal assumption that all operations are subject to the same conditions, we restate (9) as (10), where $Ph_1$ is strong and $Ph_2$ is the next highest strong phase.

(10) $Ph_1$ is interpreted/evaluated at $Ph_2$.

On similar grounds, the PIC should fall under (10). We therefore restate the PIC as (11), for (8) with ZP the smallest strong phase.

(11) The domain of H is not accessible to operations at ZP; only H and its edge are accessible to such operations.

We can henceforth restrict attention to phases that are relevant under (10), that is, the strong phases. For the same reason, we restrict attention to $v^*$ rather than light verb $v$ generally, unless otherwise indicated.

Considerations of semantic-phonetic integrity, and the systematic consequences of phase identification, suggest that the general typology should include among phases nominal categories, perhaps other substantive categories. If categorial features are eliminated from roots, then a plausible typology might be that phases are configurations of the form F-XP, where XP is a substantive root projection, its category determined by the functional element F that selects it. CP falls into place as well if T is taken to be a substantive root, as discussed earlier. Phases are then (close to) functionally headed XPs. Like TP, NP cannot be extracted, stranding its functional head. The same should be true of other nonphases.[26] Some phases are strong and others weak—with or without the EPP option, respectively, hence relevant or not for Spell-Out and the general principle (10).[27]

Let us return to (8), repeated as (12) (HP and ZP strong).

(12) $[_{ZP}\ Z \ldots [_{HP}\ \alpha\ [H\ YP]]]$

Suppose that the computation L, operating cyclically, has completed HP and moves on to a stage $\Sigma$ beyond HP. L can access the edge $\alpha$ and the head H of HP. But the PIC now introduces an important distinction between $\Sigma$ = ZP and $\Sigma$ within ZP, for example, $\Sigma$ = TP. The probe T can access an element of the domain YP of HP; the PIC imposes no restriction on this. But with $\Sigma$ = ZP (so that Z = C), the probe Z cannot access the domain YP.[28]

If Z is C in (12), then its complement TP is immune to extraction to a strong phase beyond CP, and only the edge or head of HP (a strong-phase CP or $v^*$P) is accessible for extraction to Z. The same holds for Z = $v^*$, and the observations extend to Agree. But T in the domain of Z can agree with an element within its complement, for example, with the in-situ quirky nominative object of its $v^*$P complement.[29]



If such ideas prove correct, we have a further sharpening of the choices made by FL within the range of design optimization: the selected conditions reduce computational burden for narrow syntax and phonology, and eliminate distinct LF and phonological cycles. Spell-Out (deletion) is determined quickly, under the PIC. The computation is "almost efficient," in something like the sense of Frampton and Gutmann (1999), with bounded memory load, up to the next phase.

Unification of cycles has consequences for semantic interpretation: no level constructed by the phonological component can yield more than very limited semantic interpretation. Phonological rules typically render semantically significant units unrecognizable: they eliminate "trace" so that chains cannot be reconstructed, blur or remove boundaries between units and change their phonetic content, delete semantic features (which would cause PF crash), and so on. Hence, displacement rules interspersed in the phonological component should have little semantic effect. We expect some approximation to (13), if the steps reviewed are on the right track.

(13) Surface semantic effects are restricted to narrow syntax.

As discussed in MI and sources cited, there is mounting evidence that the design of FL reduces computational complexity. That is no a priori requirement, but (if true) an empirical discovery, interesting and unexpected. One indication that it may be true is that principles that introduce computational complexity have repeatedly been shown to be empirically false. One such principle, Procrastinate, is not even formulable if the overt/covert distinction collapses: purely "covert" Agree is just part of the single narrow-syntactic cycle. With the motivation for Procrastinate gone, considerations of efficient computation would lead us to expect something like the opposite: perform computations as quickly as possible, the Earliness Principle of Pesetsky (1989). Thus, if local (P, G) match and are active, their uninterpretable features must be eliminated at once, as fully as possible: partial elimination of features under Match, followed by elimination of the residue under more remote Match, is not an option. In particular, if probe P requires Move (i.e., has an EPP-feature), then the operation must be carried out as quickly as possible. We will return to some illustrations. A natural principle, which has been suggested in various forms, is (14).[30]

(14) Maximize matching effects.

One concern of MI is to show that central properties of inflectional morphology, displacement, and related matters can be accommodated within a framework of the sort just outlined. I will assume that account (modified in accord with revisions here) to be essentially accurate as far as it goes, and turn to some extensions and further modifications.

Consider raising constructions with unaccusatives, abstracting for the moment from English-specific idiosyncrasies so that (15a) converges as (15b).

(15) a. [C [T be likely [Expl to-arrive a man]]]
b. there is likely to arrive a man

The expletive Expl has the uninterpretable feature *person*. Under local Match, Expl agrees with T and raises to [Spec, T]. The operation deletes the EPP-feature of T and the person feature of Expl, but the ϕ-set of T remains intact because Expl is incomplete (assuming (3b)). Therefore, Agree holds between the probe T and the more remote goal *man*, deleting the ϕ-set of T and the structural Case feature of *man* (assuming, as throughout, George and Kornfilt's (1981) thesis that structural Case is a reflex of agreement). The values assigned under Agree are transmitted to the phonological component: the values of *man* for the ϕ-set of T, nominative for structural Case. Uninterpretable features delete, and the derivation converges as (15b).

Suppose the smallest strong phase is $v$*P, not CP.

(16) a. [C [we [$_{v^*P}$ $v$*-expect [Expl to-arrive a man]]]]
b. we expect there to arrive a man

If the derivation is parallel to (15), then Agree holds of ($v$*, Expl), deleting the person feature of Expl but leaving $v$* intact so that Agree holds of ($v$*, *man*). The ϕ-set of $v$* deletes; structural Case of *man* is assigned the value accusative and deletes. If $v$* lacks an EPP-feature here, then (15) and (16) differ in that there is no raising to [Spec, $v^*$].[31]

In (15) and (16), no intervention effect is induced by Expl. That follows for (15) under the principle (17), conceptually plausible and empirically supported. (See MI, (51) and discussion; also see (36) below.)

(17) Only the head of an A-chain (equivalently, the whole chain) blocks matching under the Minimal Link Condition (MLC).

For (16), the same principle would suffice if raising takes place in ECM constructions.[32]



The same results hold for both (15) and (16) if matching observes the Maximization Principle (14), which entails that the intervention effect is nullified unless intervention blocks remote matching of all features. That is not the case in these examples: the probe (T or $v$*) matches Expl in one ϕ-feature (namely, the person feature), but other ϕ-features of the probe do not match Expl and are therefore free to seek a goal G, establishing (T, DO) or ($v$*, DO) match. In either case, matching values and deletes all features of the probe and goal under (14). That makes sense, and the principle is independently plausible. We will return to evidence that matching should be construed in this way. Note that the locality condition functions independently for distinct features of the probe.

Summarizing, an intervention effect is barred in (15) by principles (14) and (17), and in (16) by (14) and possibly (17), depending on the correct analysis of ECM constructions.[33]

Consider the slightly more complex case of participial passives.

(18) a. C [$_\beta$ T seem
b. [$_\beta$ $v$ expect ] [Expl to have been [$_\alpha$ caught several fish]]]

We have the same double agreement as in (15), (16): the probes (T or $v$) agree with Expl and *fish*. T deletes the uninterpretable feature of Expl (and induces raising) and assigns nominative to *fish*, as in (15); $v$ deletes the uninterpretable feature of Expl (but without raising to [Spec, $v$]; see note 31), and assigns accusative, as in (16). But in (18) there is another possibility beyond (15) and (16): the participle (Prt) agrees with the direct object (DO) *fish*. In Icelandic, furthermore, Case agreement is manifested: Prt is nominative with probe T, and accusative with probe $v$.[34]

Note that Case assignment is divorced from movement and reflects standard properties of the probes, indicating that it is a reflex of Agree holding of (probe, goal); the EPP-raising complex is a separate matter. The constructions illustrate both Case assignment without raising to the probe and EPP without Case assignment (namely, Expl in (18b)).[35] Under the Uniformity Principle (1), we conclude that Case is assigned in the same way even where not overtly manifested: structural Case of DO in unaccusative/participial constructions is nominative or accusative depending on the probe (T or $v$, respectively) in Romance, English, Mainland Scandinavian, and so on, a conclusion with ramified consequences, as recent literature illustrates.

Consider more closely the mechanics of (18). The first stage of the cycle that concerns us is α, articulated further as follows:[36]

(19) [$_{\alpha}$ Prt [catch [$_{DO}$ several fish]]]

Prt is adjectival: its ϕ-set may therefore consist of (unvalued) number, gender, and Case, but not person. The ϕ-sets of Prt and DO match, inducing Agree. DO is ϕ-complete. Hence, for Prt, number and gender receive the values of DO and delete (maximally, under (14)). But Case is unvalued for both Prt and DO, so neither can assign a Case value to the other.[37]

Next we turn to stage β of the cycle. Here again there is double agreement: (probe, Expl) and (probe, DO). Case of DO is nominative with probe T and accusative with probe *v*. Probe and DO goal lose uninterpretable features.

What about Prt? Its ϕ-features are deleted at stage α and should therefore be invisible to Match by the probe. Case of Prt cannot be valued and the derivation crashes, contrary to fact.

The problem is overcome if Spell-Out takes place at the strong-phase level. Then the ϕ-features of Prt are still visible at stage β of the cycle, though deleted; they disappear at the strong-phase level CP or *v*P, as the phase is transmitted to the phonological component. At stage α of the cycle, the ϕ-features of Prt are valued by Prt-DO matching, as just discussed. At the next stage, the probe T/*v* matches the (still visible) goal Prt, valuing its Case feature; and the probe matches the goal DO, valuing the Case feature of DO as well as its own features (since DO is ϕ-complete). At the phase level CP-*v*P, the (now valued) uninterpretable features are eliminated from the narrow syntax as the syntactic object is handed over to the phonological component.

The result, then, is that we have triple matching/agreement: (probe, Expl), (probe, DO), and (probe, Prt). Prt and DO agree with one another: directly for number/gender, indirectly for structural Case (since each agrees with the probe).

Once again no intervention effect is induced by Expl, or in this case by Prt either. In the case of (16), there were two possible reasons: principle (17) (assuming raising of Expl to within matrix VP) or principle (14), which requires maximal (probe, goal) effects. In (18), there is no raising of Prt, so we must resort to principle (14), which is therefore available for (16) as well. The number and gender features of the probe bypass Expl, and its person feature bypasses Prt, allowing probe-DO match. The locality condition again functions independently for distinct features of the probe, but more intricately than in the simpler case of (15), (16); note also that



it is essential that Prt lack person, or the structure would always crash because of unvalued structural Case for the object (violation of the Case Filter).

The same reasoning extends to more complex cases—for example, (20), with probe T or *v* in a raising or ECM construction.

(20) a. probe ... Expl ... $Prt_1$ believe $t_{Expl}$ to have been $Prt_2$ caught [$_{DO}$ several fish]
b. there were believed (we expected there to have been believed) to have been caught several fish

Here $Prt_1$, $Prt_2$, and DO agree fully for number, gender, and Case (indirectly for Case via agreement with the probe). How the features of Prt are manifested phonetically is in part a language-particular matter.[38]

Looking back at the assumptions that enter into this account, we find only one that goes beyond what seems fairly uncontroversial on minimalist grounds: the special role of the strong-phase level in narrow-syntactic computation and Spell-Out. We therefore have good additional evidence that phases exist within the framework of cyclic derivation and that evaluation/interpretation takes place only at the strong-phase level.[39]

In these constructions, another possible derivation has so far been ignored. Consider the passive counterpart (21) of (16), and suppose that Agree holds of (T, Expl) while Move applies to (T, DO), giving (21c).

(21) a. C [T be expected [Expl to-arrive [$_{DO}$ a man]]]
b. there is expected to arrive a man
c. *a man is expected there to arrive

We have just seen that deleted features remain visible until the strong-phase level; hence, the person feature of Expl is visible throughout the computation of (21). The agreement facts show that Expl does not induce an intervention effect, blocking Match of (T, *man*); but Expl does intervene to bar raising of DO. The apparent contradiction is resolved by the Maximization Principle (14). The first matching pair detected in the computation is (T, Expl). The pairing matches the person feature of Expl and the EPP-feature of T; and under (14) it therefore must do both, inducing raising of Expl and hence allowing (T, DO) Match/Agree under (17), as discussed.

For English, the unwanted raising of DO in (21) is barred for idiosyncratic reasons that I have so far put aside (also in MI, n. 40). As is well known, unaccusative constructions such as (15)–(16) and (18)–(21) are

awkward in English. More accurately, they are barred, as constructions like (22a–e) show.[40]

(22) a. *there came several angry men into the room
b. *there arrived a strange package in the mail
c. *there was placed a large book on the table
d. *how many packages did there arrive in the mail
e. *how many packages were there placed on the table

Comparable constructions are grammatical in similar languages, for example, Italian (where the in-situ position of the DO is also revealed by *ne*-cliticization) and Dutch, which has an overt Expl and offers word-by-word translations of ungrammatical English cases.

(23) hoeveel mensen zijn er aangekomen
how-many men have there arrived

The gap in the English paradigm is filled by idiosyncratic constructions such as (24) that are either fully or partially acceptable ((24a) and (24b), respectively).

(24) a. there were several packages placed on the table
b. there were placed on the table several (large) packages

Examples (15)–(16) and (18)–(21) are presumably of the same type as (24b), with invisible extraposition. Constructions of type (24a) run counter to a general tendency among the Germanic languages: at one extreme, English permits few word order options, while at the other, Icelandic permits many; but English permits (24a) while Icelandic does not.

It seems, then, that English bars surface structures of the form [V-DO], where the construction is unaccusative/passive. In such cases, DO is extracted to the edge of the construction by an obligatory thematization/extraction rule Th/Ex. The operation is reminiscent of normal displacement of subject and of object, both to edge positions, but it differs in not yielding the usual surface-semantic effects (specificity, etc.).

The phenomenon may be more general. As has occasionally been discussed, there seems to be some condition that has the consequence (25).

(25) In transitive constructions, something must escape the *v*P.

Furthermore, as Richard Kayne has observed, English marginally allows a kind of transitive expletive construction if the subject is displaced to the right, as in (26).



(26) a. there entered the room a strange man
b. there hit the stands a new journal

The idiosyncratic properties of Th/Ex might lead us to suspect that (27) holds.

(27) Th/Ex is an operation of the phonological component.

At the relevant stage of the cycle, the syntactic object α so far constructed is transferred to the phonological component for application of Th/Ex. The narrow-syntactic computation then proceeds on course with α unchanged except that the base position is phonologically empty even prior to the strong-phase level, at which point the position would have become phonologically empty even if not subject to Th/Ex.[41]

The constructions reach LF in the same form in English as in similar languages, as we would expect if LF-external systems of interpretation are essentially language-independent and prefer the LF interface to be as uniform as possible across languages—a particularly natural case of the general Uniformity Principle (1), given the virtual absence of evidence about these systems for language acquisition.

A closer look tends to support (27). One relevant consideration is that Th/Ex, leftward or rightward, is incompatible with independent movement of the extracted nominal EN, as we see in (28) ((28a–b) = (22d–e)).

(28) a. *how many packages did there arrive in the mail
b. *how many packages were there placed on the table
c. *how many men did there enter the room
d. *how many journals did there hit the stands

(24) and (26) must be incompatible with *wh*-movement: otherwise, (28) would be permitted.[42] Similarly, (29a) is much worse than (29b), indicating that (29a) has undergone (invisible) rightward extraposition, again barring *wh*-movement.

(29) a. *how many men did there arrive
b. ?there arrived three men

The incompatibility is not between Th/Ex and *wh*-movement. Thus, in (30) both operations apply.[43]

(30) a. to whom was there a present given
b. ?at which airport did there arrive three strange men

Rather, the two operations cannot apply to the same phrase.

Why does the English-specific rule Th/Ex, which extracts DO either to the left or to the right, bar *wh*-movement? A preliminary question is whether the position of EN (= DO) is immune to all syntactic operations, for example, *wh*-movement from within EN. Compare the examples in (31).

(31) a. what are they selling books about *t* (in Boston these days)
b. *what are there books about *t* being sold (in Boston these days)

The contrast rules out one pattern of derivation for (31b): given the base form (32), apply *wh*-movement to *what* within EN (as in (31a)) and then apply Th/Ex to EN including the trace of *what*, yielding (31b).

(32) there are being sold [EN books about what] (in Boston these days)

If that were possible, the two cases of (31) would be on a par. We conclude that the base position of EN is completely inaccessible to *wh*-movement, either as a whole or in part.

It remains to determine whether the EN output of Th/Ex is accessible to *wh*-movement. We know that the whole EN is not. The natural expectation is that no part of EN is either, in which case the contrast in (31) cannot be attributed simply to the degradation of movement from an internal phrase (see note 42). The examples in (33) provide some evidence that the expected conclusion is correct.

(33) a. ?who did they deliver to your office a picture of *t*
b. *who was there delivered to your office a picture of *t*
c. ?there arrived in the mail some books about global warming
d. *what did there arrive in the mail some books about *t*
e. ?what topics were there some books about *t* selling in Boston stores
f. *what topics were there some books about *t* (being) sold in Boston stores
g. ?he's the guy there were lots of songs about *t* playing on the radio
h. *he's the guy there were lots of songs about *t* (being) played on the radio

The data are less sharp than one would like, but the differences between ENs and their non-EN counterparts seem fairly clear. A reasonable conclusion, then, is that the output of Th/Ex is inaccessible to syntactic rules entirely, just as the input is—either prior to Th/Ex or by application to the trace of this operation.



Other operations are not barred for EN. Thus, EN still has to satisfy the Case Filter, which in present terms means that it is accessible to Agree, in either its base or its extracted position. And it is accessible to operations that are plausibly regarded as interpretation at the interface (binding theory, absorption).

(34) a. *he thought there were songs about John being played on the radio (*he* = *John*)
b. they thought there were songs about each other being played on the radio
c. who thought there were songs about what being played on the radio

This might mean that the EN output of Th/Ex, while immune to Move (either of the whole EN, or of part of it), is accessible to other operations. A simpler alternative is that the EN output of Th/Ex is immune to all narrow-syntactic or LF interface operations and that the operations that apply (Agree, or those at the LF interface) are accessing the trace left by Th/Ex. It is not easy to distinguish these alternatives on empirical grounds. I will assume the simpler alternative to be correct. We are then led to the conclusions in (35) ((35a) = (27)).

(35) a. Th/Ex is an operation of the phonological component.
b. Traces are inaccessible to Move, but accessible to some other operations.

Still adopting the simplest principle of a single cycle, with phonology and narrow syntax proceeding in parallel, we conclude that Th/Ex applies at the level of the verbal phrase, which we may presume to be *v*P (*v* a light verb marking unaccusative/passive), a weak phase only; the smallest relevant strong phase is the next higher CP or *v**P. Th/Ex moves EN rightward or leftward, leaving a copy without phonological features, presumably adjunction to *v*P and substitution in [Spec, *v*], respectively, if a weak phase has a phonological counterpart to EPP.

The next task is to sharpen (35b). Why is trace inaccessible to Move, and what other operations can access trace? Recall that the "trace" of XP is XP without its uninterpretable features, including its phonological features, these having been stripped away at Spell-Out, either in the normal course of derivation or by a language-specific rule such as Th/Ex, applying prior to the strong-phase level. Trace is thus an empty category (EC). The compound operation Move consists of Agree, pied-piping, and Merge.

Hence, traces must be inaccessible to one of its three components. Other ECs are accessible to Merge (e.g., first Merge of PRO or pro). Therefore, trace must be inaccessible to Agree or pied-piping. We have just seen that active trace is accessible to Agree (since EN has to satisfy the Case Filter). Therefore, its head must disallow pied-piping, preventing Move.[44] The same is true, vacuously, of inactive trace, but this element might satisfy an even stronger condition: if inactive trace is invisible not only to Agree (like other inactive elements) but even to Match (unlike others), then the principle (17), which restricts intervention to the head of a chain, would follow.

Principle (35b), then, seems to have case (36a) and possibly (36b).

(36) a. EC disallows pied-piping.
b. Inactive trace disallows Match.

Apart from these restrictions, traces should be subject to operations freely; and (36) ought to hold of ECs generally, not just trace, unless trace has to be distinguished from other ECs by virtue of its relational properties, an unwanted complexity. Such extension of (36) raises various questions. Lexical ECs undergo Move as well as Merge, unlike trace; but they are $X^0$s, so pied-piping does not apply. And (36) holds only if no XP consists solely of several merged lexical ECs.[45] Inactive argument EC (PRO, pro) raises problems for (36b) with regard to intervention effects. We would also expect that there is a more unified version of (36), if case (b) holds.

Putting these concerns aside, the properties bearing specifically on Th/Ex are these:

(37) a. Th/Ex is an operation of the phonological component.
b. Pied-piping requires phonological content.

(37a) is an idiosyncratic rule of English, (37b) (= (36a)) a principle of UG, if valid. From (37a), it follows that the output of Th/Ex is immune to all but phonological operations. From (37b), it follows that the trace left by Th/Ex is immune to Move but allows Agree and LF-interpretive operations, as required.

The conclusion supports the picture of Lex outlined earlier and modifies slightly the standard assumption that phonological features do not enter into narrow-syntactic derivations. They do not do so individually, but their absence or presence makes a difference if (37b) is correct.



The rightward variant of Th/Ex is like extraposition in that it does not iterate, perhaps a more general property of operations not driven by uninterpretable features, and/or phonological operations. We would expect the same to be true of the leftward counterpart. But alongside (20) and (38a), the latter surfacing as (38b) after application of Th/Ex, we also find (38c) and (38d).

(38) a. there are expected to be caught many fish
b. there are expected to be many fish caught
c. there are many fish expected to be caught
d. many fish are expected to be caught

(38d) is the unproblematic result of successive-cyclic A-movement with the intermediate stage (39).

(39) are expected [many fish to be caught *t*]

But (38c) is unexplained. It does not result from (39) by leftward Th/Ex, if iterated Th/Ex is barred, as expected for such rules. And both (39) and (38c) should be barred if Merge preempts Move.

We therefore ask whether there might be a different source for (38c). The obvious suggestion is a true existential construction *there be NP*, where NP includes a reduced relative. The conclusion is supported by the semantics of (38). Examples (38a–b) and (38d) have no existential import, but (38c) does: it states that there are many fish such that they are expected to be caught.[46] The same conclusions are illustrated in (40).

(40) a. there are expected to be found many flaws (→ many flaws found) in the proof
b. #there are many flaws expected to be found in the proof
c. many flaws are expected to be found in the proof
d. there are likely to be baked many cakes (→ many cakes baked) in that oven
e. #there are many cakes likely to be baked in that oven
f. many cakes are likely to be baked in that oven
g. there is likely to be taken umbrage (→ umbrage taken) at his remarks
h. #there is umbrage likely to be taken at his remarks
i. umbrage is likely to be taken at his remarks

Examples (40b,e,h) have existential import, but the others do not; hence the oddity of (40b) and (40e), presupposing that the flaws and the cakes

independently exist (the cakes have already been baked), and of the idiom chunk in (40h). Syntactic tests yield the same conclusion. Thus, constructions of the form (38c) are islands for extraction, but the others are not: (41c) can be derived from (41a), but not (41d) from (41b).[47]

(41) a. there is likely to be demolished a building (→ a building demolished)
b. there is a building likely to be demolished
c. how is there likely to be demolished a building (→ a building demolished)
d. *how is there a building likely to be demolished

Leftward Th/Ex is distinct from object shift (OS), a phenomenon whose status and scope are open to many questions. One distinction, already noted, has to do with semantic consequences: the semantic neutrality of Th/Ex is one of the reasons to believe that it falls within the phonological component; but as is well known, that is not true of OS, which we therefore expect to fall (at least in part) within narrow syntax, given the simplifications that led to (13). Continuing to assume cyclicity, the PIC, and preference for Merge over Move, OS must involve raising to the outer edge of the phase $v$*P, outside the merged subject in [Spec, $v$*]. Let us examine a few possibilities.

Languages differ with regard to the OS option: for example, Icelandic allows it freely and Mainland Scandinavian partially, while standard English/Romance do not. But if the PIC holds, the picture is a little different: every language allows OS, but in languages of the English/Romance types, the object must move on beyond the position of OS. There is no other way to derive such expressions as (42a).

(42) a. (guess) $\text{what}_{\text{Obj}}$ [$\text{John}_{\text{Subj}}$ T [$_{v\text{P}}$ $t_{\text{Obj}}$ [$t_{\text{subj}}$ read $t_{\text{obj}}$]]]
b. $\text{John}_{\text{Subj}}$ T [$_{v\text{P}}$ $\text{that}_{\text{Obj}}$ [$t_{\text{Subj}}$ read $t_{\text{Obj}}$]]

Here the DO (*what*, *that*) raises by OS, satisfying the Case Filter and erasing the uninterpretable features of $v$. In (42a), the shifted DO moves on to [Spec, CP]. In (42b), the DO remains below [Spec, TP]—allowed in an OS language, disallowed in English/Romance. The same holds for topicalization and other forms of Ā-movement.[48]

Let us put aside the language variation for a moment and ask how the non-OS languages work, allowing (42a) but not (42b).

The first thought that comes to mind is that the Equidistance Principle (43) (= (41) of MI) should be reconsidered.



(43) Terms of the minimal domain of H are equidistant from probe P.

The relevant part of (43) has to do with the edge of H. Insofar as this is true, we can restate (43) as (44).

(44) Terms of the edge of HP are equidistant from probe P.

In the $v$P of (42), the shifted object (*what* in (42a), *that* in (42b)) and the in-situ subject *John* (at $t_{\text{Subj}}$) are equidistant from the probe T, which selects the subject as its goal, inducing Agree. But only in (42a), with OS moving on to [Spec, C], can Move apply, raising the subject to [Spec, T].

In both (42a) and (42b), the shifted object in OS position is inactive,[49] hence not able to agree with T or to move to [Spec, T]. But that is unlikely to be the reason for allowing the probe to pass over it to find in-situ *John*: inactive nominals induce intervention effects. Another consideration is that shifted object apparently may agree with T and nevertheless allow subject extraction, as in the Icelandic counterpart to (45), with shifted DO in a nontransitive strong verbal phase, DO with quirky Case, and V raised to T.[50]

(45) [many students.DAT]$_{\text{Subj}}$ [find.PL]$_{\text{Vb}}$ [the computers.PL.NOM]$_{\text{DO}}$ not ugly.PL

It seems, then, that the distinction between (42a) and (42b) lies in the fact that the *wh*-phrase moves on, leaving the position "empty" (i.e., void of phonological features).

The problem we now face is that the argument seems to require countercyclic operations: assuming strict cyclicity, the subject *John* raises to [Spec, T] before the operation is authorized by vacating the outer edge of $v$P, at the subsequent CP phase. The problem we face is to show that the countercyclicity is only apparent, by recasting it in a framework that keeps to the strict cycle and allows no backtracking to recover crashed derivations along a different path: specifically, canceling OS if the position is not later evacuated.

Optimally, the operations Agree/Move, like others, should apply freely. Let us assume that they do, raising the in-situ active subject freely to [Spec, T] in the course of the derivation. The probe-goal relation must be evaluated for the Minimal Link Condition (MLC) at the strong-phase level after it is known whether the outer edge of $v$P has become a trace, losing its phonological features. Assume so, setting aside for the moment the apparent countercyclicity. That appears to leave all other consequences unchanged, with (44) restricted to the *phonological edge* of a category—

that is, an edge element with no phonological material c-commanding it within the category.[51]

(46) The phonological edge of HP is accessible to probe P.

In the structure (47), XP prevents Match of probe P and Spec, under the MLC, only if XP has phonological content.

(47) $[_{ZP} \ldots P \ldots [_{HP} XP [Spec [H YP]]]]$

The background assumption is that the lexicon Lex is only partially distributed, namely, when optimal encoding of information justifies that complication of Lex; see text at note 20. Also presupposed is that Spell-Out takes place at the next higher strong phase ZP and that the MLC too is evaluated at this stage of the derivation under the general principle (10)—a reasonable conclusion, as discussed earlier.[52] It is only at ZP that the phonological content of XP (hence the phonological-edge status of Spec) is determined.

In these terms, we dispense with the notion of equidistance and the principle (44) in which it enters. Operations are strictly cyclic, but the problem of backtracking to recover a failed derivation along a different path remains.

We can improve the picture further by relating these conclusions to earlier ones about traces—namely, (36), repeated as (48).

(48) a. EC disallows pied-piping.
b. Inactive trace disallows Match.

If XP with phonological content remains at the edge of (47), then it intervenes to prevent Match(P, Spec), hence Agree or Move of Spec. If XP moves on to [Spec, Z], its trace, being inactive with respect to T (see note 49), is invisible to Match by (48b), so Spec, now at the phonological edge, is accessible to the probe P. That suffices to establish (46), which is therefore not needed as an independent principle. (48a) suggests another way of thinking about (46): lacking phonological content, the trace of XP is not even a candidate for Move (under (48a)), so that Spec is the closest "competitor" for the operation, under a natural version of the MLC.

We might raise a more subtle question, which might have some bearing on these issues: is there any difference between Move and Agree with regard to the intervention effect of a trace in the outer edge?[53] Suppose that Move is permitted but Agree alone is barred; the phonological-edge condition of (46) frees Move but not Agree alone. That would raise interesting questions (e.g., about the locality of the postraising ([Spec, T]) relation as a factor), but it is not easy to find relevant facts. To test this possibility, we would want to investigate a language with subject-in-situ constructions (SSCs) but no OS of type (42b), so as to determine whether the pure-Agree analogue of (42a) is permitted with SSCs, as in (49).



(49) (guess) $what_{Obj}$ [there T $[_{vP} t_{Obj}$ [a man read $t_{Obj}]]]$

In Icelandic, with OS and SSCs,[54] the constructions are permitted, as expected. Thus, Icelandic has the counterpart of (50).

(50) a. there painted probably the house some students red
b. which house painted probably some students red

In English, (49) and (50) are barred, but for independent reasons. We would have to investigate the marginal constructions such as (26) in which English has something like abstract SSCs.

(51) a. there entered the room a strange man
b. which room did there enter $t_{wh}$ a man

Case (51b) seems considerably worse, which might suggest that only Move is freed from an intervention effect when at the phonological edge. But the data are too marginal for any confidence, and the degradation of (51b), if real, might be attributed to internal-extraction constraints (see note 42). Mainland Scandinavian should be a better case, because it lacks the obligatory Th/Ex rule of English. Here we find the configuration (52).

(52) a. *?there painted some students the house red
b. *there painted the house some students red
c. *?which house painted there some students red
d. which house painted probably some students red

Case (52a) illustrates the marginality of the construction, carried over in (52c). Case (52b), with OS as well, is much worse. Case (52d) is fine, which would be unsurprising and irrelevant if *some students* is in [Spec, T] and *probably* is in a TP-external position. But Holmberg points out that a definite pronoun cannot be substituted for *some students*, suggesting that it may be in its in-situ position in a kind of SSC construction, in which case the contrast between (52b) and (52c) seems problematic.

Pending better evidence and understanding, I will put aside the question of a possible Move/Agree distinction under (46).

On the assumption that OS is a free option, what distinguishes OS from non-OS languages—say, Icelandic versus English/Romance? The distinc-

tion might lie in intervention effects applying to the output of OS, or in the option of applying OS in the first place. Let's begin by exploring the first alternative, then turning to the second (concluding finally that they can be unified).

One possibility is that the OS/non-OS distinction has to do with evaluation of the probe-goal relation: the relation of T and in-situ subject. OS languages allow association of T and in-situ subject (effectively, (43)); non-OS languages allow such association only under (46), at the phonological edge. The parameter might be related to "richness of T," a richer T allowing a deeper search of the category including the goal.

What seems a more plausible possibility is that there are no differences with regard to intervention effects and that OS languages have a dislocation rule Disl that raises OS to a higher position, possibly a phonological rule similar to English Th/Ex. Then Icelandic, for example, also excludes OS without further raising of the object, either Ā-movement or Disl. Perhaps supporting that conclusion are some properties of Mainland Scandinavian, which permits object fronting for pronouns but only partially for full noun phrases.[55] Holmberg points out that the fronted pronoun is not at the edge of *v**P but in a position higher than the auxiliary, indicating that it raised there from the *v**P-edge position, perhaps by a phonological operation, or perhaps by a rule of the kind that has been proposed for clitic movement. If the former, we have an explanation for the fact that the pronoun does not bind anaphors, as Holmberg observes, citing Holmberg and Platzack 1995; similarly, a nominal in this position will not induce an intervention effect, blocking subject raising. One might then ask whether a similar rule Disl raises the full Icelandic shifted object (though to a different higher position). Constructions of the kind illustrated by (45), repeated as (53), provide additional support for this conclusion.

(53) [many students.DAT]$_{Subj}$ find.PL$v_B$ [the computers.PL.NOM]$_{DO}$ not ugly.PL

Here we have Agree(T, DO) but it cannot induce Move, raising DO rather than Subj to [Spec, T]. If Disl applies (as a phonological rule), then DO cannot raise to [Spec, T] for the reasons discussed in connection with Th/Ex, even when it agrees with matrix T.[56]

Consider now the backtracking problem. Under the "richness of T/deeper search" alternative, the problem remains: if OS has produced *v*P with multiple Spec, as in (42), then search will fail in a non-OS language if the raised object has not moved on, and the derivation must return to the pre-OS stage and proceed without application of OS. Under the Disl alternative, that may not be necessary. If Disl applies, it can be followed unproblematically by raising of subject to [Spec, T], from the phonological edge. If Disl does not apply, the subject can still raise to [Spec, T], but the derivation will crash by evaluation of the MLC at the CP phase unless the outer Spec has been evacuated by raising to [Spec, C] (see note 8). That raises no new problems if the object is a *wh*-phrase, as in (42a); then it can move to [Spec, C]. If the object is not a *wh*-phrase, as in (42b), it can be raised to [Spec, C] by topicalization. If that is a free option, then backtracking will never be necessary in this category of constructions.[57]



We will return directly to the second alternative: that the OS/non-OS distinction lies in the option of applying OS in the first place.

Still another question has to do with Holmberg's Generalization (HG): to a first approximation, OS is permitted only if V has raised to T. The principle is countercyclic, hence problematic. One might seek to reformulate it in terms of phase-level evaluation of optional OS, along lines suggested above for trace at the outer edge. A number of problems then arise, among them the fact that Ā-movement to the outer edge of *v**P does not observe HG: *wh*-movement of (or from within) the direct object, for example, does not require V-raising in OS or non-OS languages. Also pertinent is the fact that some form of phonological adjacency seems to be involved in OS:[58] "verb topicalization" (raising of V to [Spec, C], Holmberg argues) frees OS even when an auxiliary verb blocks V-raising to T, making the countercyclic property even worse. Furthermore, not just an in-situ verb, but any element (say, a preposition) bars Mainland Scandinavian shift of object pronouns, which, Holmberg argues, should be assimilated to Icelandic OS, despite some differences, primarily because both fall under HG. Particularly striking is the comparative Scandinavian evidence that Holmberg reviews concerning extraction from verb-particle constructions: just in the cases where the pronominal object precedes the verb particle (perhaps by raising) can OS apply.

Holmberg suggests that HG be reformulated along the following lines:

(54) a. OS is a phonological operation that satisfies condition (54b) and is driven by the semantic interpretation of the shifted object (new/old information, specificity-definiteness, focus or topic, etc.; call the interpretive complex *Int*).[59]

b. OS cannot apply across a phonologically visible category (except adjuncts) asymmetrically c-commanding the object position.

The basic idea is persuasive, but the implementation raises a number of questions. It requires countercyclic operations, and unlike Th/Ex, it violates the semantic expectations for phonological rules (see (13)). It is also necessary to find some different way to handle "invisible" OS in Ā-movement in OS and non-OS languages and visible OS in Icelandic-type languages (both violating (54b)). Also problematic is the way the operation is driven by semantic properties of the XP that is raised, interweaving with phonological properties of the construction. Note that the proposed rule does not fall together with other cases plausibly accounted for in terms of phonological adjacency, such as, T-V assimilation.[60]

The countercyclicity of the proposed operation, and the introduction in (54b) of a property similar to "phonological edge," suggest that the phenomena may fall under principles of phase-based derivation. Let us ask, then, whether the basic content of Holmberg's (1999) revision of HG can be derived in these terms, appealing as much as possible only to plausible general principles, along with a simple parameter that keeps intact the leading intuition: that both phonological and semantic properties are involved in HG.

Consider first the semantic properties Int of the object Obj that undergoes OS (see (54a)). Sometimes the operation is described as driven by these properties of Obj, perhaps by features of Obj that bear the interpretation Int. That is a questionable formulation, however. A "dumb" computational system shouldn't have access to considerations of that kind, typically involving discourse situations and the like. These are best understood as properties of the resulting configuration, as in the case of semantic properties associated with raising of subject to [Spec, T], which may well be related to those of OS constructions. One might also say informally that in (55), the phrase *the men* is raised in order to bind the anaphor.

(55) the men seem to each other to be intelligent

But the mechanisms are blind to those consequences, and it would make no sense to assign the feature "binder" to *the men* with principles requiring that it raise to be able to accommodate this feature. We may also say informally that someone is running to the left to catch the ball, but such functional/teleological accounts, while perhaps useful for motivation and formulation of problems, are not to be confused with accounts of the mechanisms of guiding and organizing motion. The same approach seems sensible in the case of OS. The computational system presumably treats it



as an option—if the MI approach is on the right track, feature-driven by properties of $v^*$, with the option expressed as optional choice of an EPP-feature. The resulting configuration has particular properties, as in the case of raising to subject (or catching a ball). These properties may have internal inconsistencies, posing interpretive problems—for example, a definite pronoun left in a position that assigns nonspecific interpretation. If so, the expression is deviant.

The general configuration we are considering is (56).

(56) $[_{\beta}$ C [Spec T ... $[_{\alpha}$ XP [Subj $v^*$ $[_{VP}$ V ... Obj]]]]]

The position [Spec, T] is created by merging the surface subject (by pure Merge or by Move); the XP position is created by OS (perhaps later vacated by Ā-movement or Disl). We are concerned with two properties of (56): the interpretations assigned to the configuration, and the phonological adjacency properties that enter into the formation of the (XP, Obj) chain.

Let us adopt the general background assumption that at the interface, arguments are A-chains (with one or more members).[61] The θ-role of the argument is determined by the position of first Merge—the configuration in which it takes place, within Hale and Keyser's (1993) framework for θ-theory. "Surface interpretation" is determined by the position of the head of a chain; see (13).

In (56), the θ-role is determined by the configuration of Obj. If OS does not apply and Obj remains in situ in a trivial A-chain, then the same configuration is freely interpreted at LF, taking account of inherent properties of the lexical items and the θ-role: in particular, it may have the "surface" interpretation Int or its complement Int′ If OS does apply, forming the two-membered chain ⟨XP, Obj⟩, the surface semantic role of the chain is determined by the peripheral EPP position occupied by XP, the raised object. We assume that Int is assigned to the peripheral configuration universally, adopting (57), probably a subcase of a more general principle governing peripheral non-θ (EPP) positions including [Spec, T]—a traditional idea, still somewhat obscure.

(57) The EPP position of $v^*$P is assigned Int.

Let us now return to the parameter that distinguishes OS and non-OS languages, adopting the second of the two perspectives mentioned earlier: that the distinction lies in the option of applying OS. Two factors enter into OS: assignment of Int-Int′, and phonological adjacency. Suppose the parameter is (58).

(58) At the phonological border of $v$*P, XP is assigned Int′.

By the "phonological border" of HP, we mean a position not c-commanded by phonological material within HP (see note 51). The concept is broader than "phonological edge," which holds only of edge elements (and is now only an expository device, with the reduction to (48)). For example, in (59), if H and the edge (Spec) of HP are vacated by raising, then Comp is at the border but not the edge.

(59) HP = [Spec [H Comp]]

As throughout, we assume that (58) is evaluated at the next higher strong phase, in accord with (10): at the stage β in (56).

OS languages observe (58), non-OS languages do not. In the construction (56) in an OS language, if Obj is at the phonological border of $v$*P and resists interpretation Int′ (say, a definite pronoun), it must undergo OS to avoid a deviant outcome, raising to the EPP position so that the chain will be assigned Int. It need not undergo OS in a non-OS language, or in an OS language if it is $v$*P-internal—by which we mean *not at the phonological border*.

That is a start, but more is needed. We have to guarantee that OS applies just in the right places. In the worst case, these effects are specified by particular conditions; a much better result would be that they follow from a general principle applying to optional rules, which captures the functional/teleological intuition about rule application. The natural suggestion, based on ideas of Reinhart (1993 [1997]) and Fox (1995, 2000), is a general economy principle: an optional rule can apply only when necessary to yield a new outcome.

Within the current framework, the optional rule in these constructions assigns an EPP-feature to $v$*, thus allowing (and requiring) OS. The guiding intuition is formulated in MI as (60).[62]

(60) Optional operations can apply only if they have an effect on outcome: in the present case, $v$* may be assigned an EPP-feature to permit successive-cyclic Ā-movement or Int (under OS).

The proposal we are considering, then, is that OS reduces to (61), where (61a) and (61b) are invariant principles—special cases of more general principles governing optionality and interpretation of peripheral positions, respectively—and (61c) is the parameter that distinguishes OS and non-OS languages.



(61) a. $v$* is assigned an EPP-feature only if that has an effect on outcome.
b. The EPP position of $v$* is assigned Int.
c. At the phonological border of $v$*P, XP is assigned Int′.

Under (10), principle (61a) is evaluated at the next strong phase, where the interpretive operation (61c) also applies: CP containing $v$*P, in the cases under consideration. At that point, it is known whether $v$*-V has raised (to T or to C/[Spec, C]).

Suppose L is a non-OS language, not observing (61c) (e.g., Romance). Then interpretations can be assigned freely in the position of first Merge, including Int or Int′. Under the economy principle (61a), $v$* may have an EPP-feature, inducing OS, only if that is required in order to yield some outcome other than Int-assignment (which is already free without the EPP-feature and resulting OS): for example, successive-cyclic Ā-movement. Otherwise, Obj remains in situ, whether $v$*P-internally or at the phonological border.

Suppose that L is an OS language observing (61c) (Icelandic, and following Holmberg, Mainland Scandinavian as well, with somewhat different conditions). Suppose Obj is $v$*P-internal, c-commanded by unraised $v$*-V, preposition, particle, and so on. Then the situation is exactly as in non-OS languages: interpretation can be assigned freely, and $v$* may have an EPP-feature, forcing OS, only to yield some new outcome other than Int-assignment (already available in situ)—Ā-movement, for example. Suppose Obj is at the phonological border of $v$*P. If it remains in that position, the (one-membered) chain will be assigned Int′ under (61c); if it raises by OS, the (two-membered) chain will be assigned Int. Under principle (61a), $v$* may have an EPP-feature, forcing OS and the new interpretation Int. The choice is optional. If Obj resists Int′ (say, a definite pronoun), failure to exercise the option yields extreme deviance; if Obj resists Int, exercising the option has the same effect. But the internal semantic properties of Obj are not part of the mechanism of the rule, just as the intention of binding an anaphor is not part of the mechanism of raising.

To illustrate, in Icelandic or Mainland Scandinavian, the counterpart of (62a) is not well formed but the counterpart of (62b) is.

(62) a. *I have her$_{Obj}$ not [seen $t_{Obj}$]
b. I saw$_v$ her$_{Obj}$ not [$t_v$ $t_{Obj}$]

In (62a), the trace $t_{Obj}$ of *her* is in a $v$*P-internal position: the $v$*-V complex has not raised. The parameter (61c) is inapplicable, and therefore $v$* cannot have an EPP-feature (as in English/Romance). Accordingly, (62a) cannot be generated: the pronoun remains in situ, free to receive Int (or, deviantly, Int′). In (62b), the trace $t_{Obj}$ is at the phonological border of $v$*P after verb raising. Accordingly, parameter (61c) permits the option of an EPP-feature for $v$* under principle (61a), allowing assignment of Int to the pronoun chain.[63]

For an English-type language L lacking V-raising, the parameter is inapplicable: the condition in (61c) never holds, so L is necessarily non-OS. Suppose L is an OV language, the order base-generated or derived by object raising. If L is an OS language, then shift is always possible, whether or not V raises. Parameter (61c) distinguishes Romance from Germanic (Standard English aside), while the OV/VO parameter distinguishes Dutch-German from Scandinavian.

Ignored so far is the case of Icelandic OS crossing the subject, for example, constructions of the form (50a) and (63), where $\alpha$ is the original $v$*P, $t_{Vb}$ the trace of the raised $v$*-V complex, and $t_{Obj}$ the trace of the shifted pronominal object (see note 54).

(63) there read it (never) [$_{\alpha}$ any students $t_{Vb}$ $t_{Obj}$]

Though the verb has raised, its object remains in $v$*P-internal position because the subject has not raised, so that OS should not be permitted under (61). The problem could be overcome by restricting the notion $v$*P-internal to the domain of $v$*, but that might not be necessary. Consider again the principle (25): something must be raised from transitive $v$*P. Hence, if the subject remains in situ, the object must escape $v$*P. Therefore, $v$* is permitted to have an optional EPP-feature under the economy principle (61a), allowing OS in this case.

Returning to the basic configuration (56), repeated as (64), we have the two strong phases $\alpha$ and $\beta$: $v$*P and CP, respectively.

(64) [$_{\beta}$ C [Spec, T . . . [$_{\alpha}$ XP [Subj $v$* [$_{vP}$ V . . . Obj]]]]]

OS takes place within the $v$*P phase $\alpha$, but the conditions (61) that apply to it are evaluated only at the next higher CP phase $\beta$, when V-raising may have taken place: to T, or to C/[Spec, C] under V-topicalization. This is in accord with the principle (10) that all evaluation/interpretation takes place at the next higher strong phase, including Spell-Out.



If tenable, these proposals yield the essential conclusions of HG on the basis of general principles and a simple parameter, capturing Holmberg's intuition that the rule of OS involves a kind of phonological adjacency but is motivated by semantic requirements.[64] There is no recourse to countercyclic operations violating the Extension Condition. Nothing need be said about violations of phonological adjacency: specifically, Icelandic OS and the first stage of Ā-movement.[65] The function of the rule is expressed without teleological devices or special features on Obj to drive the derivation, questionable in any event and also invoking Greed with its attendant computational complexity. We can keep to the interpretive principle (13) for "surface interpretation," and the simplifications of general architecture that underlie it. The only features involved are the familiar ones: EPP, and Case/agreement features, functioning in accord with independently motivated principles. Icelandic and Mainland Scandinavian OS are partially unified, with differences remaining to be explained; for both, OS satisfies the revised version of HG.

The account so far leaves open the possibility that V-raising is comparable to Th/Ex and Disl: not part of the narrow-syntactic computation but an operation of the phonological component. Either way, the phonological content of base V is determined prior to Spell-Out at the strong-phase level, so that the effects of the revised HG are determined as well.

There are some reasons to suspect that a substantial core of head-raising processes, excluding incorporation in the sense of Baker (1988), may fall within the phonological component. One reason is the expectation of (near-)uniformity of LF interface representations, a particularly compelling instance of the methodological principle (1), as in the case of Th/Ex (see (27) and comment). The interpretive burden is reduced if, say, verbs are interpreted the same way whether they remain in situ or raise to T or C, the distinctions that have received much attention since Pollock 1989. As expected under (1), verbs are not interpreted differently in English versus Romance, or Mainland Scandinavian versus Icelandic, or embedded versus root structures. More generally, semantic effects of head raising in the core inflectional system are slight or nonexistent, as contrasted with XP-movement, with effects that are substantial and systematic. That would follow insofar as head raising is not part of narrow syntax.

A second reason has to do with what raises. Using the term *strength* for expository purposes, suppose that T has a strong V-feature and a strong nominal feature (person, we have assumed; D or N in categorial systems).

It has always been taken for granted that the strong V-feature is satisfied by V-raising to T (French vs. English), not VP-raising to [Spec, T], and that the strong nominal feature is satisfied by raising of the nominal to [Spec, T] (EPP), not raising of its head to T. But the theoretical apparatus provides no obvious basis for this choice. The same is true of raising to C and D. In standard cases,[66] T adjoins to C, and an XP (say, a *wh*-phrase) raises to [Spec, C], instead of the *wh*-head adjoining to C while TP raises to [Spec, C]. And N raises to D, not NP to [Spec, D]. These conclusions too follow naturally if overt V-to-T raising, T-to-C raising, and N-to-D raising are phonological properties, conditioned by the phonetically affixal character of the inflectional categories (see note 60). Considerations of LF uniformity might lead us to suspect that an LF-interpretive process brings together D-N and C-T-V (see note 8) to form wordlike LF "supercategories" in all languages, not only those where such processes are visible.

Other considerations have to do with the nature of the head-raising rule, which differs from core rules of narrow syntax in several respects. It is an adjunction rule; it is countercyclic in ways that are not overcome along the lines discussed earlier; the raised head does not c-command its trace;[67] identification of head-trace chains raises difficulties similar to those of feature movement, since there is no reasonable notion of occurrence; it observes somewhat different locality conditions. All of this is unproblematic if overt adjunction is a phonological process reflecting affixal properties.

Note further that if excorporation is excluded, head movement is not successive-cyclic, like the rules Th/Ex and Disl discussed earlier, which are plausibly assigned to the phonological component. It could be, in fact, that iterability is a general property of operations of narrow syntax, but these alone.

Boeckx and Stjepanović (1999), extending and modifying work by Lasnik (1999, chap. 7), argue that some problems of pseudogapping can be accounted for by the assumption that head movement is a phonological process, also citing other recent work that finds differences between head movement and XP-movement.

The same conclusion is suggested in recent work on aphasia by Grodzinsky and Finkel (1998), extending earlier work of Grodzinsky's. They argue that a range of symptoms can be explained in terms of inability to identify XP chains, but they note that the results do not carry over to $X^0$ chains; the result is expected if head raising is a phonological process, creating no chains.



A few final comments of a more general nature.

In considering these issues, we want to be careful to distinguish terminological artifacts from what may be substantive matters. The question commonly arises with regard to the status of entities introduced in linguistic description and theoretical exposition, raising issues often regarded as controversial. Let us turn to a few of these.

Consider the notion of chain. In MI and earlier work, a chain is understood to be a sequence of identical elements—more precisely, a set of *occurrences*, where an occurrence of K is taken to be its sister (not an entirely innocuous proposal, as noted in MI). Thus, in (65a) we have the chain (65b) consisting of two occurrences of K = *John*, $K_1$ being the syntactic object corresponding to *T-be killed John* and $K_2$ corresponding to *kill*.

(65) a. John was killed
b. $\{K_1, K_2\}$

Several aspects of this description have been regarded as problematic under minimalist assumptions, among them (1) the fact that an occurrence of K is an X′ category, neither $X^0$ nor $X^{max}$, hence arguably invisible, and (2) the very notion of a chain as a set of occurrences formed by multiple merger, not a "syntactic object" susceptible to computational operations as the concept is recursively defined (see Epstein and Seely 1999).

It is not clear, however, that the issues are real. Take the notion of occurrence as X′ sister. The conceptual and empirical arguments for X′ invisibility are slight. The conceptual argument relies on the assumption that X′ is not interpreted at LF, which is questionable and in fact rejected in standard approaches. The empirical argument is that it allows incorporation of (much of) Kayne's (1994) Linear Correspondence Axiom within an impoverished (bare) phrase structure system.[68] But that result, if desired, could just as well be achieved by defining "asymmetric c-command" to exclude (X′, YP) (a stipulation, but not more so than X′ invisibility).

Furthermore, even if X′ were shown to be an inappropriate choice for "occurrence," nothing much seems to follow. Recall that the relation provided most directly by Merge is Immediately-Contain (set membership). Suppose we define "occurrence" in terms of Immediately-Contain, taking an occurrence of K to be not its sister but its "mother," the category immediately containing it, a terminological device that also has the

advantage of rendering the notion "occurrence-of" asymmetric. We then replace the chain (65b) by CH = {$K_3$, $K_4$}, where $K_3$ is the syntactic object corresponding to the TP (65a) and $K_4$ to the VP *kill John*, CH a proper chain because there is a single XP (here *John*) of which both $K_3$ and $K_4$ are occurrences.[69]

Consider the status of chains and the operation multiple Merge, constructing chains. It is not clear that these are more than terminological conveniences. No operations of L apply to chains. Principles holding of chains can be expressed directly in terms of occurrences (e.g., the uniformity condition on bar level), as can interpretive operations referring to chains: for example, principles of θ-role assignment and surface interpretation discussed earlier, or conditions on reconstruction. Some heads H have a property P that determines that H heads an occurrence; P is the EPP property of H, commonly taken to be a selectional feature satisfied by merging K. K may be an expletive or a category determined by probe-goal agreement and pied-piping; the latter is the case of multiple Merge. With no apparent substantive change, we may dispense with multiple Merge and reconstrue Move as the operation Agree/pied-piping/Mark, where Agree holds of (probe H, goal G) as before, and Mark identifies H as the head of an occurrence HP of the pied-piped category K determined by G. How Mark identifies H is a terminological matter: it could be, for example, by constructing an "occurrence list" to which we add the pair ⟨K, HP⟩. K now appears only once in the syntactic object formed, in the position of initial Merge, a θ-configuration if K is an argument.[70] Under the simplest assumptions, a principle of phonology spells K out at its highest (i.e., maximal) occurrence in the course of the cyclic derivation, as already discussed; and surface interpretation attends (at least) to the highest occurrence as well.[71]

Under the conventional interpretation, satisfaction of EPP (by Merge or Move) forms the new category $H^{max}$ = {K, H′} with label H and an H projection HP as occurrence of K. Under the interpretation just outlined, satisfaction of EPP adds the new item {K, HP} to the occurrence list. The two approaches are essentially the same, virtually down to notation. There are differences in the computational operations, but they seem insignificant. And sharpening of the concepts does not seem to raise very serious difficulties.

As for EPP, under the former interpretation, but not the latter, it is a selectional feature. In either case, it is an uninterpreted feature (*feature*, as usual, meaning just linguistic property), an apparent imperfection,



which we hope to show is not real by appeal to design specifications (perhaps along lines sketched in MI and elsewhere). Resort to an uninterpreted feature is inescapable. Something distinguishes among heads H that require, allow, or disallow that H head an occurrence of K. And while there may be semantic consequences to displacement, these are surely not properties of an interpretable feature of the head. Expletive constructions do not have the semantic properties of overt-subject constructions, and similar considerations hold for OS, as discussed; the semantic properties of in-situ versus displaced *wh* are not plausibly expressed as properties of the interrogative head; and so on.

If this analysis is correct, then we can proceed freely to use the conventional chain notation with all of its conveniences, understanding that it is reducible to the sterner "official" theory with no chains or multiple Merge. There are further ramifications, but I will put the matter aside.

A broader category of questions has to do with the "internalist" conception of language adopted in this discussion, and in the line of inquiry over the past 40 years from which it derives, a branch of what has been called "biolinguistics" (see Jenkins 1999). FL is considered to be a subcomponent of Jones's mind/brain; Jones's (I-)language L is the state of his FL, which he puts to use in various ways. We study these objects more or less as we study the system of motor organization or visual perception, or the immune or digestive systems. It is hard to imagine an approach to language that does not adopt such conceptions, at least tacitly. So we discover, I think, even when it is strenuously denied, but I will not pursue the matter here. Internalist biolinguistic inquiry does not, of course, question the legitimacy of other approaches to language, any more than internalist inquiry into bee communication invalidates the study of how the relevant internal organization of bees enters into their social structure. The investigations do not conflict; they are mutually supportive. In the case of humans, though not other organisms, the issues are subject to controversy, often impassioned, and needless.

We also speak freely of derivations, of expressions Exp generated by L, and of the set of such Exps—the set that is called "the structure of L" in Chomsky 1986, where the I/E terminology is introduced.[72] Evidently, these entities are not "internal." That has led to the belief that some externalist concepts of "E-linguistics" are being introduced. But that is a misconception. These are not entities with some ontological status; they are introduced to simplify talk about properties of FL and L, and they can be eliminated in favor of internalist notions. One of the properties of

Peano's axioms PA is that PA generates the proof P of "2 + 2 = 4" but not the proof P′ of "2 + 2 = 7" (in suitable notation). We can speak freely of the property "generable by PA," holding of P but not P′, and derivatively of lines of generable proofs (theorems) and the set of theorems, without postulating any entities beyond PA and its properties. Similarly, we may speak of the property "generable by L," which holds of certain derivations D and not others, and holding derivatively of an expression Exp formed by D and of the set {Exp} of those expressions. No new entities are postulated in these usages beyond FL, its states L, and their properties. Similarly, a study of the solar system could introduce the notion HT = {possible trajectories of Halley's comet within the solar system}, and studies of motor organizaton or visual perception could introduce the notions {plans for moving the arm} or {visual images for cats (vs. bees)}. But these studies do not postulate weird entities apart from planets, comets, neurons, cats, and the like. No "Platonism" is introduced, and no "E-linguistic" notions: only biological entities and their properties.

**Notes**

1. Chomsky (2000). For background, see references cited there and Lasnik 1999b, among many others.

2. In what follows, there is no use of labels except for the new object γ, which has the label of either α or β, determined (in the best case) by algorithm. This item is similar to the *locus* that determines the next operation in the system developed by Collins (1999), who proposes that labels be eliminated more generally.

3. Alternatively, associated with T as an Agr node, a collection of uninterpretable ϕ-features selecting T that can also appear elsewhere, selecting a different element; this more complex alternative may be justified, but will be put aside here. Some problems it raises are mentioned in note 12. Others have to do with selection: it is unclear how a collection of such features (unvalued, it will be argued) can have the required selectional properties.

4. Terminology is often metaphoric here and below, adopted for expository convenience.

5. EPP = Extended Projection Principle. Note that the EPP-feature alone is not sufficient to identify a target; the ϕ-set (or comparable features, for other probes) is required to determine what kind of category K is sought.

6. There is presumably a similar but distinct agreement relation, Concord, involving Merge alone.

7. And without recourse to some such device as the distinction between erasure and deletion, invoked in Chomsky 1995 to deal with a paradox of Extended Standard Theory–based systems with a single position for Spell-Out: the "overt" part of the narrow-syntactic computation eliminates uninterpretable features, but they have to remain until the stage of Spell-Out of the full syntactic object, because of their phonetic reflexes.



8. For expository purposes, I take the nominal with structural Case to be N and use T and C as cover terms for a richer array of functional categories, as in MI. On light verbs, see among others Hale and Keyser 1993, Harley 1995. Call *v* with full argument structure *v**: transitive *v* or experiencer. Only *v* was considered in MI, and I will largely keep to it below. Where assigned by V, not *v*, Case is inherent. Quirky Case largely falls under general Case assignment principles if understood to be inherent Case with an additional structural Case feature (as in MI). We will return to examples.

9. One question is whether (3a) and (3b), if valid, follow from other properties of FL. That seems plausible, but there are many factors to be considered.

10. In English, the expected form *awarded several prizes* surfaces more naturally as *several prizes awarded*. We will return to the matter.

11. Reconstruction for trace of A-movement, as distinct from PRO, was discovered (to my knowledge) by Luigi Burzio, a discovery later published in Burzio 1986: for example, such distinctions as *one interpreter each* (*was assigned* t, **planned PRO to speak*) *to the visiting diplomats*. For extensive review of these topics, see Fox 2000, Sauerland 1998. For a different approach, see Lasnik 1999a. With P = T + raising verb, [Spec, $T_{def}$] may apparently be manifested: for example, in Icelandic defective infinitivals, possibly reflecting the transitive expletive construction option (see MI).

12. On eliminating categorial features in favor of root structures with functional heads, see Marantz 1997, MI. Functional categories lacking semantic features require complication of phrase structure theory (see MI), a departure from good design to be avoided unless forced. Agr elements, for example, should arouse skepticism (see also note 3). Similarly, D—or at least one variant of D—might be associated with referentiality in some sense, not just treated as an automatic marker of "nominal category"; nonreferential nominals (nonspecifics, quantified and predicate nominals, etc.) need not then be assigned automatic D (at least, this variant of D).

13. For example, *it is to go home* (*every evening*) *that John prefers* (**seems*) (Rizzi 1982). Other early evidence involved reconstruction effects (see note 11). Rizzi explained the distinction in terms of government, a notion not readily available in the framework presented here.

14. Some related ideas are developed by Pesetsky and Torrego (this volume).

15. See Epstein and Seely 1999 for proposals to this effect.

16. The extension is suggested by proposals of Koizumi (1995), Lasnik (1999a,b), and Epstein and Seely (1999), differing from one another and from the version here, which is, furthermore, oversimplified. Second Merge of first-merged object of V makes little sense. The account should be restated, as in the sources cited, in terms of an Agr node selecting V and, by symmetry, selecting T (Agr in turn selected by appropriate *v* and C). It is, then, Agr and not T/*v* that is the locus of ϕ-features,

Case, and EPP, in the version presented here. Since I will not be pursuing this course, in part for reasons discussed later, I will keep to the simplified exposition.

17. For $T_{comp}$, the EPP-feature is apparently obligatory; for $V_{comp}$ as well, for the sources cited in note 16.

18. One variant might supplement (6) by taking T (and substantive categories generally, including V) to be always defective, so that the locus of nominative Case and subject-verb agreement is C, not T (see Pesetsky and Torrego, this volume, for related ideas). In the notation just used, this alternative falls under $Locus_{C_{\nu^*}}$.

19. It has occasionally been suggested that the EPP-feature of the probe P is a Case-assigning feature $F_C$. If correct, that would leave the basic picture intact: $F_C$ is an uninterpretable selectional feature inducing Merge (sometimes Move), distinct from the features of P that enter into Agree. But it does not seem to be correct. There is good reason to believe that structural Case correlates with agreement, hence also long-distance agreement (without raising to Spec), and accordingly that EPP is satisfied without Case assignment (see (18) and discussion). If either is correct (both seem to be), Case assignment and EPP are independent phenomena.

20. On the current state of DM, see Harley and Noyer 1999. The idea of late insertion derives from Beard 1995.

21. For an illustration in the case of Latin deponent verbs, see Embick 2000.

22. $LA_i$ is a subset of LA, drawn from Lex, but the objects it makes available are those labeled by elements of $LA_i$, perhaps complex objects already constructed in the course of the derivation, which proceeds in parallel. Suppose that LA is eliminated in favor of iterated selection of $LA_i$ from Lex. The cost is that reduction of computational burden is far less and that search of arbitrary depth is needed to determine whether an item selected from Lex is new. Suppose that $LA_i$ is eliminated and phases are constructed from LA (or the entire Lex). The cost is greater computational burden, in a certain sense. Again, the conceptual arguments are not decisive.

23. See Legate 1998 and, for the broader picture with regard to reconstruction in such cases, Fox 2000.

24. Namely, head movement involving inflectional categories: to C, or to T (hence to a position between the $v$P and CP phases; see note 8). We will return to the status of head movement.

25. The idea that the phonological component can choose which element of a chain to spell out has been investigated since Groat and O'Neil 1996. Any such approach requires either new UG principles or language-specific rules to determine how the choice is made.

26. For VP, testable only with a nonaffixal light verb. One might consider treating preposition stranding within the same context.

27. Head movement aside; see note 24. For conclusions about next-higher-phase evaluation drawn from the theory of control, see Landau 1999.



28. It is accessibility of the domain of weak phases at $\Sigma$, under (10), that permits the extension of phases to weak phases, yielding the preferred result of relative phonetic-semantic integrity of phases, an extension barred in MI.

29. The consequences include some barrier/Relativized Minimality–type phenomena (Empty Category Principle, Subjacency, and Head Movement Constraint effects). They extend partially to Huang's (1982) Condition on Extraction Domain if phases include DPs, as just suggested. For A-movement, (3a) is not obviated; thus, the PIC prevents access to an inactive subject of CP from the next strong phase, but not from a higher T with no intervening strong phase (as in **T be believed [that John is intelligent]*, with Agree(T, *John*) barred by (3a) but not the PIC). For $\bar{A}$-movement, questions arise of the kind mentioned earlier, along with others, among them the issue of Slavic-style multiple *wh*-movement violating Subjacency.

30. It follows that the computation cannot ignore matching of (P, G), ultimately crashing because of cyclicity and intervention effects. Not to be confused with such reduction of complexity (very limited, because of the PIC) is backtracking of the kind associated with the principle Greed, which allows recovery of a derivation along a more complex path. Other false starts are still not barred. For example, suppose that $\alpha$, T, V are available and the first choice selects T as the complement of $\alpha$. Cyclicity prevents selection of V by T, and the derivation crashes. On maximization principles of the kind (14), see among others a preliminary version of McGinnis 1998.

31. A separate question is whether Expl raises to a position within the $v^*$ complement. See note 16. The proposed raising of object does not have the syntactic and semantic properties of raising to [Spec, $v^*$] (object shift) and therefore presumably is raising internal to the $v^*$ complement, distinct from the kind of raising in (15). Lasnik (1999b) and Epstein and Seely (1999) take Case of *a man* to be determined in situ, along the lines suggested by Belletti (1988): an inherent Case in present terms, perhaps partitive, but in any event independent of agreement and distinct from nominative/accusative. This seems questionable, in part for reasons that appear directly.

32. The observation is irrelevant if Case is assumed to be assigned to the object in situ, as in the proposals cited (see notes 16, 31).

33. Another possibility is that probe-goal match is evaluated first for the most local pair, subjecting deleted features to Spell-Out, then for the most local remaining pair, and so on. Thus, the first step deletes the single $\phi$-feature of Expl, rendering it invisible for the next step relating (probe, DO). The proposal would not, however, yield other consequences of (14) and (17).

34. On manifestation of agreement and its relation to raising, see Guasti and Rizzi 1999.

35. Consider alternative 2, with EPP a property of the matrix transitive verb (*expect* in (18b)), however the idea is implemented (see notes 16, 31; also 19). The EPP property should be independent of the embedded clause: whether it is transitive (with the subject raising into the *expect*-phrase) or nontransitive (as in (18)):

whether the language always exhibits Expl overtly (as in English) or only in certain contexts (as in Icelandic). If so, the matrix verb in (18b) has an EPP-feature, but assigns Case independently of that, to the embedded object *fish*, just as T assigns Case to *fish* in (18a) independently of its EPP-feature. Similarly, the EPP-feature of the probe is independent of Case assignment to Prt.

36. To simplify, take Prt to be a light verb distinct from $v^*$. Here T is $\phi$-complete, selected by C. If C is missing and T defective, then the same analysis just transfers to the first $\phi$-complete probe. If the proposal of note 18 is tenable, then C is within $\beta$, extending the parallelism of (18a) and (18b).

37. Furthermore, Prt is $\phi$-incomplete (hence unable to value features), and both Prt and DO lack the (structural) Case-assigning property of T, $v$.

38. See note 34. In these terms, we can partially overcome a problem that arises within the $\text{Locus}_{\text{TV}}$ framework (alternative 2, above), if selection is reduced to Match/Agree. The $\phi$-features of $T_{comp}$ and $V_{comp}$ are unvalued until they function as probes, then deleting. But they must be available to delete the $\phi$-features of C and $v^*$, which select them. That is unproblematic if Spell-Out takes place at the strong-phase level, though another problem remains: the final operation, capturing selection, violates (3a). It seems questionable, however, that alternative 2 can be sustained, in the light of the considerations just reviewed.

39. To sharpen the issues, one would like to find a language with overt nonclitic expletives, ECM, free use of unaccusatives, and a rich enough manifested morphology to tell whether verb-object agreement holds uniformly between the probe and DO of the lower verb, as in Icelandic. Among unresolved questions are the reasons for Romance-style participial agreement contingent on movement, as discussed in Kayne 1989 and subsequent work. It is simple enough to state the parameter ("Spell out $\phi$-features of Prt-goal only if probe induces Move"), but there should be a more principled account, perhaps related to the manifestation-move correlations discussed by Guasti and Rizzi (1999). In any approach in the neighborhood of those surveyed here, movement to [Spec, Prt] (specifically, in nontransitive constructions) would be an additional stipulation, hence no improvement over the straightforward description in terms of probe-goal match; the idea faces other problems, noted by Philip Branigan and Dominique Sportiche (see Chomsky 1995, (132)).

40. On the English-Italian contrast with regard to (22c), see Lasnik 1999b, where a different approach is developed.

41. Note that this amounts to highly limited access of narrow syntax to effects of the phonological component.

42. Compare (28b) with *how many packages were there lying on the table*, much more acceptable (as is (28b), if interpreted as involving stative/adjectival passive), indicating that the status of (28b) is not simply the result of incomplete internal constituent constraints on movement (Kuno 1973). Note that after displacement to the right or left, the trace/copy cannot move; if it did, (28a) and (28b) would be essentially the LF forms of (i) and (ii), respectively.



(i) there arrived *t* in the mail [how many packages]
(ii) there were [how many packages] placed *t* on the table

The LF forms are permissible, as counterparts in other languages illustrate (e.g., (23)); and (i), (ii) are permissible, on a par with (24a–b).

43. Extraction from within PP is of course barred here (**which airport did there arrive at* t *three strange men* vs. *which airport did three strange men arrive at*), presumably an illustration of constraints mentioned in the preceding note. If Th/Ex belongs to the phonological component, then these effects hold within that component, a conclusion about "surface effects" that is consistent with (13).

44. A consequence, Luigi Rizzi points out, is that null Op cannot pied-pipe (*the man* [Op *I spoke to*] vs. **the man* [[to Op] *I spoke*]).

45. There are other assumptions, among them, that in structures relevant for pied-piping, roots will have at least some phonological specification in the optimal encoding of Lex; very radical allomorphic variation is unexpected for open classes, as noted earlier.

46. Existential import is not a simple matter. For example, *there are steps missing in that proof* does not presuppose that the steps exist and can be filled in to complete the proof; and *there is something lacking in his novel* (a spark, vitality, humor, the characters are wooden, . . .) presupposes nothing about the possibility of overcoming the defect. But in *there are steps expected to be missing in that proof* and *there is something expected to be lacking in his novel*, the existential import returns. Note that the contrast in existential import between (40a) and (40b) indicates that constructions of the form (24a) are not to be construed as *there be NP* constructions, unlike (38c).

47. Examples from Lasnik 1999b, within a somewhat different framework of assumptions.

48. Nothing here turns on the question whether OS is substitution in outer Spec or adjunction; in either case, it is to the edge of the construction, invoking the PIC. It is sometimes supposed that multiple Spec is a stipulation, but that is to mistake history for logic.

49. Irrelevantly, in (42a) the *wh*-phrase is active, having an unvalued uninterpretable feature *wh*; but the probe T does not seek that feature.

50. Examples provided by Anders Holmberg and Thorbjörg Hróarsdóttir, who also point out surprising and unexplained complexities about intervention effects in such cases, apparently turning on matching of quirky Case number and raising of subject to transitive expletive construction position. See also note 56 below.

51. Perhaps "c-commanding from the left," depending on the proper treatment of such matters as rightward adjunction and questions raised by Kayne (1994) about linear ordering.

52. The effect on the MLC is limited under the PIC, which bars "deep search" by the probe.

53. The question is suggested by problems raised by Susi Wurmbrand.

54. See Jonas 1996. Many questions about the data remain obscure, but not in ways relevant here, it appears. Icelandic and Mainland Scandinavian data presented here are provided by Anders Holmberg (personal communication).

55. See Holmberg 1999, on which I am relying for data here and below, along with personal communication.

56. Unexplained is why shifted quirky DO can remain active, unlike shifted structural accusative DO. One can think of possible answers related to the default versus $T_{comp}$ options of quirky Case in [Spec, T] and other options available to quirky Case; or it might be necessary to weaken (3a), which requires that goal as well as probe be active for Agree to hold. The cases reviewed so far (see notes 29, 38) are consistent with the assumption that (3a) holds only for (P, G) pairs in different phases, with G in the domain (not the edge) of the lower phase. But unresolved factual questions make suggestions premature (see note 50).

57. Free topicalization may produce expressions with deviant interpretations, but that is not a problem. The *wh*-phrase case depends on how the operation is to be understood: Is there an uninterpretable *wh*-feature? Is there matching with an appropriate C = Q? What is the status of *wh*-in situ in typologically different languages? And other questions, including some mentioned earlier.

58. See Holmberg 1986, Bobaljik 1995, observations extended in Holmberg 1999.

59. See Diesing 1992, Rizzi 1997. Condition (54b) is (38) of Holmberg 1999.

60. Raising or lowering. See Lasnik 1981, 1999b, and Bobaljik 1994.

61. We take a chain to be a set of occurrences of the first-merged XP, as in MI, returning to the matter below. The discussion can easily be revised for other formulations of LF-interpretive operations.

62. Discussion of (24) and notes 50, 52 of MI, paraphrased here. I restrict attention here to LF outcome.

63. The tacit assumption is that the object pronoun first moves to the outer edge of $v$*P (as required by (13)), then on to its surface position, whatever the latter operation may be.

64. Consider the issue of intervention effects discussed earlier, with the "richness of T" and Disl alternatives. Neither alternative introduces further parametric variation. For non-OS languages, an extra EPP-feature is permitted for $v$* under (61a) only with *wh*-movement and Topicalization. The "richness of T" alternative (invoking equidistance, otherwise perhaps unnecessary) applies only in OS languages. Under the more natural Disl alternative (without equidistance), the phonological rule Disl is a universal option, vacuous for non-OS languages.

65. In the latter case, interpretation depends on how *wh*-constructions and the like are construed. Holmberg observes that *it*-type expletives may undergo OS; whether this obviates Int depends on how we understand the expletive-associate relation in such cases.

66. The qualification is intended to leave open other possibilities: for example, TP-raising to [Spec, C] in accord with Kayne's (1994) theory of linearity, head raising versus XP-raising as a possible distinction between *wh*-in-situ and overt raising (see MI and sources cited, particularly Watanabe 1992 and Hagstrom 1998). The N → D rule developed in Longobardi 1994 and subsequent work has crucial semantic consequences, but it seems that these might be reformulated in terms of the properties of D that do or do not induce overt raising.



67. Commonly, head movement is held to observe c-command, but with a stipulated disjunctive definition for this case, which does not fall under the "free" relation of c-command derived from Merge (see MI). The Head Movement Constraint has been assimilated to general locality conditions in various ways, but special features remain, it seems.

68. Other apparent distinctions between X′ and XP dissolve—largely or completely—with more systematic reinterpretation of relations and operations in terms of labels rather than phrasal categories, as in MI and here.

69. An occurrence defined in terms of IC is an $X^{max}$ except in the case of multiple Spec. If necessary for some reason, the notion could be modified to require it to be an $X^{max}$ here as well (perhaps taking the occurrence to be a pair (K, XP), XP the smallest $X^{max}$ containing K). But sharpening may be superfluous. Occurrences are significant only for moved elements, chains are properly distinguished on independent grounds, and the arguments for invisibility are by now so weak that there is no compelling reason to pursue the matter.

70. This is the θ-theoretic principle (6) of MI, a direct consequence of Hale and Keyser's (1993) conception of θ-theory adopted there. The added assumption is that violation of the principle, which is detectable at once, causes crash.

71. Consider successive-cyclic movement that begins by forming an A-chain and then proceeds to form an Ā-chain—standard *wh*-movement of HP, for example. It is not necessary to think of the single chain as broken up into two for the purposes of interpretation. Rather, there are two sets of occurrences for HP, which is merged just once: the set of occurrences of H (the A-chain) and the set of occurrences of *wh* (the Ā-chain).

72. The purpose was to avoid consistent misunderstanding of the technical usage of the notion "grammar" and others, but the proposed terminology was further misunderstood as suggesting that there are two topics, I- and E-linguistics (I- and E-languages, etc.), the latter concerned with utterances, corpora, behavior, Platonic objects, and so on. The E-concepts, however, were defined as "anything else," intended to identify no coherent object or study. Furthermore, utterances and behavior are no more or less a concern of I-linguistics than of studies of language that might be called (misleadingly, I think) varieties of E-linguistics.

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