

# **Syncretism in Paradigm Function Morphology and Distributed Morphology<sup>1</sup>**

**(short title: Syncretism in PFM and DM)**

Ruth Kramer

Georgetown University

**Abstract:** In the development of morphological theory, restrictiveness and maximal empirical coverage of the facts must be carefully balanced. In this discussion chapter, I use the empirical phenomenon of syncretism to explore the restrictiveness/coverage dichotomy in two morphological theories: Distributed Morphology (DM) and Paradigm Function Morphology 2 (PFM2), drawing on Stump (this vol.) and Trommer (this vol.). As previous work has observed, the theories contrast in their approach to this dichotomy: DM tends towards restrictiveness, whereas PFM2 tends towards maximal empirical coverage. I show that syncretism is a useful tool for exploring the advantages and pitfalls of these positions, and I identify open questions for both theories whose answers would contribute to resolving this dichotomy.

---

<sup>1</sup> Acknowledgements: many thanks to Daniel Siddiqi, Mark Norris, and Lindley Winchester for comments on the manuscript and to Katherine Vadella for research assistance. Thanks are also due to audiences at Roots IV, the 44<sup>th</sup> North American Conference on Afroasiatic Linguistics, the 4<sup>th</sup> Cambridge Comparative Syntax Workshop, Harvard University, and the University of Chicago for helpful feedback on portions of this work.

## 1 Introduction

In the development of morphological theory, restrictiveness and maximal empirical coverage of the facts must be carefully balanced. If a theory is too restrictive, it might rule out attested empirical patterns. If a theory is too permissive, it might predict unattested empirical patterns. In this discussion chapter, I use the empirical phenomenon of syncretism to explore the restrictiveness/coverage dichotomy in two morphological theories: Distributed Morphology (DM) and Paradigm Function Morphology 2 (PFM2), drawing heavily on Stump (this vol.) and Trommer (this vol.). As previous work has observed (see e.g., Noyer 1998, Bobaljik 2002, Albright and Fuß 2012), the theories contrast in how they approach this dilemma: DM tends towards restrictiveness, whereas PFM2 tends towards maximal empirical coverage. I show that syncretism is a useful tool for exploring the advantages and pitfalls of each of these positions, and I identify open questions for both theories whose answers would contribute to resolving this dilemma.<sup>2</sup>

The discussion here builds directly on the lucid comparisons of DM and PFM found in Noyer 1998, Bobaljik 2002, Albright and Fuß 2012, and Stump (this vol.) among others. However, this paper stands apart in several ways. First, the

---

<sup>2</sup> For broad overviews of syncretism, see Baerman, Brown, and Corbett 2005, Bobaljik 2002, Baerman 2007a, Müller 2008, and Albright and Fuß 2012, among many others.

primary goal is comparison of DM and PFM, rather than having theory comparison be a digression from the development of an analysis (or a digression from comparison of DM and another theory, as in Bobaljik 2002). Moreover, the aim is to be as neutral as possible, rather than to argue for one approach over the other (although in the interests of full disclosure, I conduct research in DM). Finally, this paper relies primarily on the most recent iteration of PFM: PFM2 as outlined in Stump (this vol.). This version of PFM2 differs substantially from earlier versions of PFM (PFM1: Stump 1993, 2001) and it is more fleshed out than earlier iterations of PFM2 (Stump 2002, 2006, 2007, 2012, Stewart and Stump 2007).

The paper is structured as follows.<sup>3</sup> In Sections 2 and 3, I describe the basic DM and PFM2 approaches to syncretism. I open Section 4 by identifying some similarities between the theories including that they both rely on (i)

---

<sup>3</sup> This paper does not address how to distinguish syncretism from accidental homophony (see e.g., Albright and Fuß 2012:238-247), the diachronic development of syncretisms (see e.g., Albright and Fuß 2012:273ff.), or the use of syncretic forms to resolve syntactic feature mismatches (see e.g., Pullum and Zwicky 1986). Following Baerman, Brown, and Corbett 2005, I only consider contextual syncretism (Calabrese 2008, 2011 Albright and Fuß 2012:236), i.e., when a language *L* morphologically distinguishes two features [F] and [G] in context *C*, but does not distinguish them in context *C'*. Finally, I focus only on affix syncretism, not whole-word syncretism; see Bobaljik 2002, Baerman, Brown, and Corbett 2005, Müller 2008.

underspecification of exponents and (ii) morphological operations that remove features. However, in the majority of Section 4, I discuss the differences between DM and PFM2 with respect to syncretism, focusing on how their different approaches to restrictiveness/coverage affect the analysis of the most challenging cases of syncretism (e.g., the morpheme; see Trommer (this vol.)).

## **2 Syncretism in DM**

### *2.1 DM Basics*

I start with a quick review of the basic tenets of DM, although I assume the reader is already familiar with the framework (see Halle and Marantz 1993, Harley and Noyer 1999, Embick and Noyer 2007, and Bobaljik 2011, among others, for more comprehensive presentations). DM assumes that syntax feeds Phonological Form (PF) and that morphological operations occur along the PF branch. The syntax manipulates feature bundles, which lack morphophonology, and the feature bundles are exponed at PF via Vocabulary Insertion.

At Vocabulary Insertion, a Vocabulary Item (VI; a pairing of a piece of morphophonology and a set of features) is inserted at a syntactic feature bundle. Vocabulary Items compete to be inserted at a syntactic feature bundle, and the competition is (partially) adjudicated by the Subset Principle (Halle 1997). In

brief, the Subset Principle ensures that the Vocabulary Item will be inserted which matches the most features of the syntactic feature bundle, but does not contain any features which are not present in the feature bundle. Vocabulary Insertion is also regulated by the Elsewhere/Pāṇinian Principle, e.g., a Vocabulary Item with specific restrictions is inserted instead of a default Vocabulary Item (when both equally match the features in the syntactic feature bundle).

Importantly, paradigms are epiphenomenal in DM. They have no theoretical status and they are never referred to by morphological operations. During Vocabulary Insertion, the grammar considers a range of Vocabulary Items that (partially or fully) match the features of the syntactic feature bundle in question. Vocabulary Items are not selected for competition based on any predefined paradigmatic relations. In Section 3, it will become clear that the status of paradigms is a fundamental difference between DM and PFM.

## *2.2 Shared- and Nonshared-Feature Syncretism in DM*

The Subset Principle allows for a Vocabulary Item to expone fewer features than are present in the syntactic feature bundle. This underspecification of Vocabulary Items is used to account for two different types of syncretisms in DM. First, consider verbal agreement in Hupa, shown in Table 1 (Athabaskan; analysis based on Embick and Noyer 2007, data from Golla 1970). Grayed-out cells indicate syncretism throughout the paper.

Table 1: Agreement in Hupa

	<b>Subject</b>	<b>Object</b>
<b>1 sg</b>	W-	Wi-
<b>2 sg</b>	n-	ni-
<b>1 pl</b>	di-	noh-
<b>2pl</b>	oh-	

Subject agreement has a different exponent for each of the feature combinations. However, object agreement has the same exponent in the plural regardless of whether it is first or second person. In Hupa, then, first and second person are syncretized in plural object markers.

Hupa object agreement is an example of *shared-feature syncretism*,<sup>4</sup> where the two syntactic feature bundles that are syncretized have one or more features that they share exclusively. For concreteness, I assume the following syntactic feature bundles for Hupa plural agreement.

- (1)      a.      [1], [SUBJ], [+PL]  
           b.      [1], [OBJ], [+PL]  
           c.      [2], [SUBJ], [+PL]

---

<sup>4</sup> The term “shared-feature syncretism” is intended to be roughly equivalent to “simple syncretism” in Baerman, Brown, and Corbett (2005) and “unstipulated syncretism” in Stump (2001). I prefer the term “shared-feature” since it is more descriptive.

d. [2], [OBJ], [+PL]

(1)b and (1)d syncretize and they are the only bundles with both the features [+PL] and [OBJ] (the latter is a shorthand for the feature that distinguishes subject agreement from object agreement). Embick and Noyer (2007) propose that the feature bundles in (1) are realized by the Vocabulary Items in (2).

- (2)
- a. [1], [SUBJ], [+PL] ↔ *di-*
  - b. [2], [SUBJ], [+PL] ↔ *oh-*
  - c. [OBJ], [+PL] ↔ *noh-*

In a plural subject agreement context, there are two Vocabulary Items that can potentially be inserted: (2)a if the syntactic bundle contains [1], and (2)b if it contains [2]. However, in a plural object agreement context, there is only one Vocabulary Item that can be inserted per the Subset Principle: (2)c. (2)c does not expone person features, i.e., it is underspecified for person with respect to the syntactic feature bundle. Since only one form (*noh-*) is inserted in object agreement where the language uses two separate forms in subject agreement (*di-*, *oh-*), underspecification of Vocabulary Items captures the person syncretism in Hupa object agreement.<sup>5</sup>

---

<sup>5</sup> Underspecification is of course not a new concept in morphology; it dates back at least to Jakobson 1936 (see Albright and Fuß 2012:249 on the history of underspecification). However, DM makes use of underspecification in a particular way -- allowing a subset relation between the syntactic feature bundle and the features on a Vocabulary Item.

In fact, any shared-feature syncretism can be accounted for via underspecification in DM; the shared feature(s) will be part of a VI that wins the competition for both of the syncretized feature bundles. In Hupa, the relevant feature bundles are the only syntactic feature bundles containing both [2] and [OBJ], so those features can be used to pick out just those two feature bundles. This results in the bundles being expounded by the same Vocabulary Item: ((2)c).

It is also possible to analyze in DM syncretisms across feature bundles that do not uniquely share features. This is done by appealing to a default Vocabulary Item. Consider the Amharic determiner paradigm in Table 2, where the form *-u* is used to expone three feature combinations out of four (Leslau 1995:155ff.).

Table 2: Amharic Determiners

	<b>Feminine</b>	<b>Masculine</b>
<b>Singular</b>	-wa	
<b>Plural</b>		-u

I assume the determiners are associated with the syntactic feature bundles in (3).

- (3)
- a. [D],[DEF],[-F],[-PL]
  - b. [D],[DEF],[+F],[-PL]
  - c. [D],[DEF],[-F],[+PL]
  - d. [D],[DEF],[-F],[+PL]

(3)acd are syncretized (all expounded with *-u*), but they do not share any features that are exclusive to them alone (they all have [D] and [-DEF], but these are shared



with (3)b). Therefore, this is an instance of a **nonshared-feature syncretism**.

This syncretism can be accounted for if the  $-u$  Vocabulary Item is a default. Following Kramer 2009, I propose the following Vocabulary Items compete for insertion at definite determiner feature bundles in Amharic.

- (4)      a.      [D],[DEF],[+F],[-PL] ↔ -wa  
            b.      [D],[DEF] ↔ -u

(4)a is clearly the best match for (3)b. (4)a cannot match any of the other bundles since its features conflict. (4)b therefore wins the competition for insertion at (3)a, (3)c and (3)d even though it is underspecified for phi features.<sup>6</sup> In general, this type of analysis is even capable of capturing a syncretism across feature bundles that have no features in common at all if a default/elsewhere Vocabulary Item is proposed that expones no features (see e.g., Halle 1997, Calabrese 2008).

An underspecificational analysis of nonshared-feature syncretisms requires that the VI which expresses the syncretism be plausibly analyzed as a default. However, there are attested nonshared-feature syncretisms that do not use default forms (sometimes referred to as morphemes). These cases will be discussed further for DM in Section 4, building heavily on Trommer (this vol.).

### *2.3 Metasyncretisms in DM*

---

<sup>6</sup> There is evidence that this analysis is on the right track: it predicts  $-u$  will be inserted at any determiners that lack gender features, and this prediction is borne out (Kramer 2015:17).

An underspecification analysis is stated over individual Vocabulary Items: a certain Vocabulary Item is underspecified with respect to a certain feature and that feature therefore is syncretized across feature bundles. However, sometimes syncretisms occur on a more abstract level, with a given feature participating in a syncretism across different Vocabulary Items. For example, in many languages, gender is syncretic in all plural agreement contexts (see e.g., Corbett 1991:155): even if the Vocabulary Items for verbal agreement, adjectival agreement, etc., are different, they all do not express gender distinctions in the plural. This type of pattern is known as a metasyncretism (Williams 1994, Bobaljik 2002, Harley 2008) -- a syncretism that holds across multiple contexts regardless of the Vocabulary Items used to express it.

For example, Coptic (Egyptian (Afroasiatic)) is a language where gender is metasyncretic in the plural, as shown in Tables 3 to 5.

Table 3: Coptic Determiners (Layton 2011:44)

	<b>Feminine</b>	<b>Masculine</b>
<b>Singular</b>	t-	p-
<b>Plural</b>	ŋ-	

Table 4: Coptic Personal Prefixes: Durative Verbs (Layton 2011:65<sup>7</sup>)

	<b>Singular</b>	<b>Plural</b>
<b>1<sup>st</sup> pers</b>	ti-	tḥ-
<b>2<sup>nd</sup> pers</b>	k- (m.)	tetḥ-
	te- (f.)	
<b>3<sup>rd</sup> pers</b>	f- (m.)	se-
	s- (f.)	

Table 5: Coptic Independent Personal Pronouns (Layton 2011:65)

	<b>Singular</b>	<b>Plural</b>
<b>1<sup>st</sup> pers</b>	anok	anon
<b>2<sup>nd</sup> pers</b>	ḥtok (m.)	ḥto:tḥ
	ḥto (f.)	
<b>3<sup>rd</sup> pers</b>	ḥtof (m.)	ḥtow
	ḥtos (f.)	

Masculine and feminine gender are syncretized in plural determiners, plural verbal agreement markers, and plural pronouns, but the plural forms of these categories are all realized by different Vocabulary Items.

---

<sup>7</sup> Variants omitted for ease of exposition.

As noted in Bobaljik 2002 and Harley 2008, an underspecification analysis can generate a metasyncretism by brute-force, but then the same syncretism must be stated multiple times in the grammar -- once for every Vocabulary Item that participates in the metasyncretism. For example, I assume the following syntactic feature bundles for plural definite determiners in Coptic.

- (5) a. [D], [DEF], [+PL], [+FEM]
- b. [D], [DEF], [+PL], [-FEM]

The following Vocabulary Items compete for insertion at these bundles.

- (6) a. [D], [DEF], [-PL],[+FEM] ↔ t-
- b. [D], [DEF], [-PL],[-FEM] ↔ p-
- c. [D], [DEF], [+PL] ↔ ŋ-

Vocabulary Item (6)c will be inserted at both (5)a and (5)b, since it does not have any feature mismatches with them. Even though (5)a and (5)b have different gender features, (6)c can be inserted at both because it is underspecified for gender. Thus, the gender syncretism is captured for determiners.

However, all the agreeing elements in Coptic would have to have their Vocabulary Items be configured like (6)a-c. This would describe the facts correctly, but it would not explain them. It would be sheer coincidence that all of the agreeing elements in Coptic do not show gender distinctions in the plural.

Instead, DM uses the morphological operation Impoverishment to effect a syncretism across multiple contexts simultaneously (see e.g., Bobaljik 2002, Harley 2008, Nevins 2011, Arregi and Nevins 2012). In DM, certain operations

can operate over syntactic feature bundles before they are expounded (see e.g., Halle and Marantz 1993, Embick and Noyer 2001, 2007, among others).

Impoverishment is one such operation, and it removes a feature from a syntactic feature bundle (Bonet 1991, Noyer 1998, Bobaljik 2002, Harley 2008, Nevins 2011, Arregi and Nevins 2012, among others).<sup>8</sup>

In Coptic, I propose that an Impoverishment operation removes any gender feature from a plural feature bundle (cf. Bobaljik 2002, Harley 2008 on similar gender/number patterns in other languages). The operation is shown in (7) and the relevant Vocabulary Items are in (8).

(7) Coptic Impoverishment of Gender

$$\begin{array}{ccc} [+PL] & \rightarrow & [+PL] \\ & & [+/-FEM] \end{array}$$

(8) Vocabulary Items for Coptic Definite Determiner<sup>9</sup>

a. [D], [DEF], [+FEM] ↔ t-

---

<sup>8</sup> Throughout the paper, I assume the “classic” formalization of Impoverishment as feature deletion, rather than feature value deletion followed by insertion of the unmarked value (see e.g., Noyer 1998, Harbour 2003, Calabrese 2011, Arregi and Nevins 2012) or obliteration of an entire node (Calabrese 2011, Arregi and Nevins 2012). It is an open question whether the discussion of restrictiveness in Section 4 would be significantly affected if these proposals were adopted.

<sup>9</sup> The feature [-PL] is no longer necessary in the singular Vocabulary Items. Since Impoverishment removes the gender feature from all plural feature bundles, the fact that the singular Vocabulary Items have gender features is sufficient to distinguish them from the plural Vocabulary Item.

- b. [D], [DEF], [-FEM] ↔ p-
- c. [D], [DEF], [+PL] ↔ ŋ-

After (7) applies, a plural syntactic bundle cannot be expounded using a Vocabulary Item with gender features like (8)a or (8)b since this would violate the Subset Principle. Therefore, no syntactic nodes with both plural features and gender features expone their gender features morphologically. Since Impoverishment operates on all feature bundles containing a gender feature and a plural feature, regardless of how the feature bundles are ultimately expounded, the metasyncretism is derived in one fell swoop.

#### *2.4 Interim Summary: DM*

DM offers two mechanisms for capturing syncretisms: underspecification of Vocabulary Items and Impoverishment of feature bundles before Vocabulary Insertion. The former captures non-metasyncretisms that are specific to individual Vocabulary Items, whereas the latter captures metasyncretisms that hold across a range of Vocabulary Items. Underspecification is limited to cases where either (i) the two syntactic feature bundles that participate in the syncretism exclusively share one or more features or (ii) the VI that expresses the syncretism is a default. Given this background on DM, I proceed to discuss syncretism in PFM2, a framework whose fundamental assumptions are very different from DM.

### 3 Syncretism in PFM2

#### 3.1 PFM2 Basics

As the name suggests, Paradigm Function Morphology is heavily reliant on paradigms and on functions that relate one paradigm to another. The touchstone work is Stump 2001, but more recent work (e.g., Stump 2002, 2006, 2007, 2012, this vol., Stewart and Stump 2007) has made significant modifications, leading to two versions of the theory: PFM1 (Stump 2001) and PFM2 (later work). I focus on PFM2, and I assume the reader is familiar with Stump (this vol.) so the discussion here is somewhat abbreviated.

One of the most noticeable differences between DM and PFM2 is that DM assumes that paradigms are epiphenomenal, whereas PFM2 is defined in terms of paradigms and functions between paradigms. In PFM, a paradigm is a set of cells where each cell is a pairing of some lexical element (a lexeme or a stem) with a set of properties. There are two main types of paradigms: the content paradigm and the form paradigm.<sup>10</sup> The paradigm which is relevant to the syntax is the

---

<sup>10</sup> In Stump (this vol.), the exponents/realizations are also a paradigm – each cell is a pairing of a morphophonological string with a set of features/properties. However, this paradigm is not referred to in the analysis so I do not discuss it further.

content paradigm, a set of cells which each consist of a pairing of a lexeme and a set of properties relevant to the syntax/semantics.

However, rules of exponence are not predicated directly over the cells in the content paradigm. Instead, they are predicated over the form paradigm, a set of cells where each cell is a pair of a stem and a set of morphosyntactic properties. The content paradigm and the form paradigm are formally related in that there is a correspondence relationship between their cells: every content cell in a content paradigm has a corresponding form cell in a form paradigm (its form correspondent). The correspondence relation is formalized via a paradigm linkage rule; in the transparent, ideal cases the rule has the effect that the content paradigm and the form paradigm have identical morphosyntactic properties. This rule is stated in (9) over a lexeme  $L$ , a stem  $X$  and a set of properties  $\sigma$ .

(9) Universal Default Rule of Content Paradigm & Form Paradigm Linkage

Given a lexeme  $L$  having  $X$  as its stem, the content cell  $\langle L, \sigma \rangle$  has the form cell  $\langle X, \sigma \rangle$  as its form correspondent.

(Stump 2012:259, see also Stump 2002:149, Stump 2006:286, Stewart and Stump 2007)

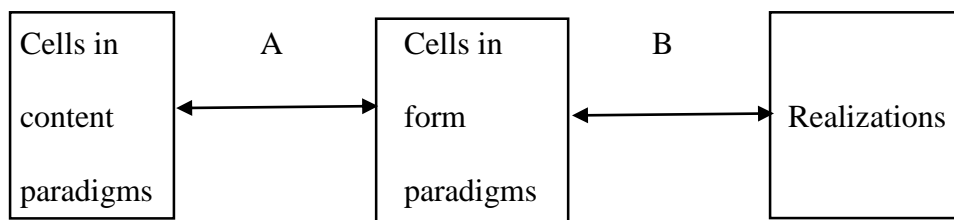
In the following sections, I show how this transparent relationship between the two sets of properties can be made more complex to account for syncretism.

The cells in the form paradigm are realized via rules of exponence that map property constraints to exponents. A rule of exponence  $R$  is applicable to a form cell  $F$  if and only if the property set of  $F$  satisfies the property constraint of



R. A property constraint is satisfied by the property set of F when the properties of the constraint (e.g., {second person, singular}) are present in the property set of F.<sup>11</sup> When multiple affixes are attached to a stem, the rules of exponence are organized into disjunctive blocks. The application of a given block at a certain time in the derivation is determined by the language's paradigm function (how a language maps paradigm cells to realizations), and the Elsewhere Principle is used to determine which rule applies in a block. The details of rule ordering for rules of exponence are less relevant for syncretism; see Stump 2001, Stewart and Stump 2007, and Stump (this vol.) for further exposition.

The relationships between paradigms can be represented graphically as Figure 1, based on Stump 2012:257, (6).



Arrow A: paradigm linkage rules

Arrow B: rules of exponence

Figure 1. The architecture of PFM

---

<sup>11</sup> This is an oversimplification for ease of exposition. See Stump this vol. for further details on property constraints.

The heart of PFM2 is the paradigm function – the path from paradigm cells to their realizations. For the content paradigm, this involves the paradigm linkage rule followed by rules of exponence, as shown in Figure 1.

### *3.2 Syncretism in PFM2*

PFM2 relies on two tools to generate syncretisms: (i) underspecification of property constraints on rules of exponence and (ii) modification of property sets via the property mappings from content cells to form cells. The empirical focus of Stump (this vol.) is the Old English verbal system, and accordingly I use Old English data to exemplify the analysis of syncretisms.

The Old English verbal system does not furnish any examples of shared-feature syncretism (as far as I can ascertain), but Stump (2001:213) observes that “unstipulated syncretisms” (the equivalent of shared-feature syncretism; see fn. 4) are accounted for in PFM1 via a “poverty” in the rules of exponence, i.e., by having the property constraint of a rule of realization lack the syncretized feature(s). In Stump (this vol.), underspecified property constraints are also used to capture nonshared-feature syncretisms when the syncretic exponent is a default, like the Amharic determiner syncretism in Section 2. I start this section by describing one of these nonshared-feature syncretisms in Old English and sketching its analysis via an underspecified property constraint.

In Old English verbs, the suffix *-st* is the default form for 2<sup>nd</sup> person singular indicative agreement. The only exception is for past tense strong verbs, which have the suffix *-e* instead. This is shown in Table 6.<sup>12</sup>

Table 6: Second Person Verbal Agreement Suffixes in Old English

	Person	Singular	Plural
<b>Present Indicative</b>			
Strong Verb	2	-st	-ap
Weak Verb			
<b>Past Indicative</b>			
Strong Verb	2	-e	-on
Weak Verb		-st	

The syncretism expressed by *-st* is a nonshared-feature syncretism since there is no feature(s) that picks out 2<sup>nd</sup> sing present indicative singular strong verbs, 2<sup>nd</sup> sing present indicative weak verbs, and 2<sup>nd</sup> sing past indicative weak verbs to the exclusion of 2<sup>nd</sup> sing past indicative strong verbs.

To see how this syncretism is analyzed, it is necessary to sketch the path from content cell to rule of realization for this particular dataset. Inflection class

---

<sup>12</sup> I omit the immediate vowels before *-st* since Stump (this vol.) generally analyzes them as separate morphemes from *-st*.

is added as part of the property mappings from a content cell to a form cell, so there are only two content cells for the four possible feature combinations. The content cells are shown in (10), with L standing for lexeme.

- (10) a. <L, {2 sg prs ind}>  
b. <L, {2 sg pst ind}>

These content cells are mapped onto four different form cells, depending on what inflection class is assigned to the lexeme. In (11), {S} is strong verb inflectional class, and {W} is weak verb inflectional class.

- (11) a. <Stem, {2 prs S}>  
b. <Stem, {2 prs W}>  
c. <Stem, {2 pst S}>  
d. <Stem, {2 pst W}>

The properties {sg} and {ind} were removed as part of the property mappings from the content cells ((10)) to the form cells ((11)). This is because only singular indicative verbs make person distinctions in Old English, and Stump (this vol.) assumes that all other verbal content paradigms lack person features (see Section 4.1 for further discussion of this assumption). Therefore, the singular and indicative features are not needed to morphologically distinguish the verbal forms in (11) from plural verbs and from verbs in other moods, so they are removed for parsimony (see fn.9 in Section 2 for similar assumptions in DM).

The relevant portion of the set of rules of realization is reproduced in (12), with X standing for Stem and {...} a property constraint.

(12) Rules of Exponence for Old English: Block III (partial list)

a.  $X, \{2\} \rightarrow Xst$

b.  $X, \{2 \text{ pst } S\} \rightarrow X$

At Block III of the rules of exponence, the form cell (11)c satisfies the property constraint of (12)b and thus will not change from its earlier form (in Stump (this vol.), the *-e* suffix is added to the stem during an earlier block).<sup>13</sup> However, all the other form cells in (11) only satisfy the property constraint of (12)a, so each will gain the suffix *-st* regardless of their tense properties or their inflection class properties.<sup>14</sup> Thus, the nonshared-feature syncretism in 2<sup>nd</sup> singular indicatives is derived by a rule of exponence whose property constraint is underspecified for tense and inflection class.

Besides underspecification, the other tool used to analyze nonshared-feature syncretism in PFM2 is the property mappings between content cells and form cells. As noted in Section 3.1, in the clearest cases, the property mapping from the property set of a content cell to the property set of its form correspondent is the identity function. However, this need not be the case. Property mappings

---

<sup>13</sup> Form cell (11)c also satisfies the property constraint of (12)a. However, PFM2 assumes the Elsewhere Condition and (12)b is more specific than (12)a.

<sup>14</sup> One might wonder how (12)a is prevented from applying to a form cell with properties  $\{2 \text{ pl}\}$ . Stump (this vol.) assumes plural verbs never have person features in their content cells, and person features are not added to plural verbs via property mappings. Therefore, a plural verb would never have  $\{2\}$  in its form cell correspondent and thus would not satisfy the property constraint on (12)a.

can instead remove features from the property set of the content cell, which Stump (this vol.) calls “impoverishment” (not to be confused with the morphological operation in DM). Property mappings can also add features to the property set of the content cell, which Stump (this vol.) calls “enrichment” (not to be confused with the novel DM operation from Müller 2007). Finally, the same inflectional property can have one value in the property set of the content cell and a different value in the property set of the form cell, called “dissonance.”<sup>15</sup>

For example, Stump (this vol.) uses dissonance to analyze the nonshared-feature syncretism between present plural indicative verbs and plural imperative verbs, both of which are exponed via the suffix *-aþ*. The only property these verbs have in common is {pl}, but the suffix *-aþ* is not the default plural exponent in Old English (the default plural exponent is *-n*; see Stump (this vol.): example (9)l). Therefore, an underspecification approach to this nonshared-feature syncretism cannot work, and the property mappings must be used instead.

The content cells for the present plural indicative and the present plural imperative are in (13).

---

<sup>15</sup> “Dissonant” property mappings take the place of “rules of referral” from PFM1. One major difference between property mappings and rules of referral is that property mappings occur before rules of exponence (unlike rules of referral, which could be interleaved with other rules; this addresses one of Noyer 1998’s criticisms of PFM1). Also, property mappings are less stipulative than rules of referral – they must exist in general to translate property sets from content cells to forms cells, and they are used for other effects besides directional syncretisms.

- (13) a. <L, {pl prs ind}>  
 b. <L, {pl imp}>

To capture the syncretism, Stump (this vol.) proposes that the {imp} property in plural imperatives is mapped to {prs ind}, resulting in identical property sets in the form cell correspondents of (13)ab. The property mapping (pm) is in (14), where  $\sigma[x \rightarrow y]$  is the set  $\tau$  that is identical to  $\sigma$  except  $\tau$  contains  $y$  instead of  $x$ . The resulting form cell correspondents of (13)ab are in (15)ab.

- (14)  $\text{pm}(\sigma: \{\text{pl imp}\}) = \text{pm}(\sigma[\text{imp} \rightarrow \text{prs ind}])$   
 (15) a. <S, {pl prs ind}>  
 b. <S, {pl prs ind}>

Since the form cell property sets are identical in (15)ab, the two content cells that they correspond to will end up being realized via the same exponent, i.e., the same rules of exponence apply to both (modulo any effect of strong/weak inflection class). This results in them having the same suffix despite having different content cell property sets, i.e., it derives the syncretism. Importantly, this is distinct from unshared-feature syncretism derived via underspecification of rules of exponence where three form cells with **different** property sets ((11)abd) were realized via the same exponent (-*st*) because the property constraint of the rule of exponence ((12)a) is underspecified.

### 3.3 Metasycretism in PFM2

In order to identify a metasyncretism, it is necessary to look across paradigms to see whether the same feature combinations are syncretized across different exponents. Stump (this vol.) only discusses verbs, so it is not possible to look at agreement across different categories of agreeing elements as was done for Coptic in Section 2.3.

However, the Old English verbal system does furnish an example of a metasyncretism which cuts across inflection class contexts. Specifically, 1sg past indicative verbs and 3sg past indicative verbs are syncretic in both strong and weak verbs even though the syncretized form is different: a bare stem for strong verbs, and an *-e* suffix for weak verbs. To account for this, Stump (this vol.) proposes that the two content cells with property sets {1sg past ind} and {3sg past ind} will have form cell correspondents with the same property set {3 past}, modulo inflection class. The relevant property mappings are in (16), where  $\sigma \setminus \{x\}$  is  $\sigma$  with  $x$  removed.

- (16) a.  $\text{pm1}(\sigma:\{\text{sg ind}\}) = \text{pm1}(\sigma \setminus \{\text{sg ind}\});$   
 b.  $\text{pm1}(\sigma:\{\text{1 pst}\}) = \text{pm1}(\sigma[1 \rightarrow 3])$

The content cell property set {1sg pst ind} is mapped to {1 pst} via (16)a, and then to {3 pst} via (16)b. The content cell property set {3sg pst ind} is mapped to {3 pst} via (16)a. Thus, both content cells have a form cell correspondent property set containing {3 pst} although one is {3 pst S} and the other {3 pst W}.

The form cells for the strong verbs and the form cells for the weak verbs then undergo different rules of exponence.



(17) Rules of Exponence for Old English: Block II

a.  $X, \{ \} \rightarrow Xe$

b.  $Xi, [ [ \{W2\} \vee \{W3\} ] \wedge [ [ \{2\} \vee \{3\} ] \vee \{imp\} ] ] \rightarrow Xa$

c.  $X, [ \{S\} \wedge [ \{3\ pst\} \vee \{imp\} ] ] \rightarrow X$

d.  $X, \{pl\ pst\ ind\} \rightarrow Xo$

e.  $X, \{inf\} \rightarrow Xan$  (Stump (this vol.))

The form cells with a strong verb property undergo (17)c which does not add a suffix, whereas the ones with a weak verb property undergo (17)a which adds –*e*.<sup>16</sup> Thus, the metasyncretism is derived by a set of content cells having the same form cell correspondent property set except for inflection class, and then rules of exponence inserting different exponents depending only on inflection class.

Because metasyncretisms hold across multiple exponents, metasyncretisms must be accounted for in PFM2 via property mappings that make the property sets of form cells identical before exponents are inserted.

### 3.4 Interim Summary: PFM2

PFM2 analyzes syncretisms via (i) underspecification of the property constraints on rules of exponence or (ii) dissonance/impoverishment property mappings. Stump (this vol.) does not discuss when to use underspecification and

---

<sup>16</sup> Block I is only for stem adjustments, and nothing happens to either form cell in Block III.

when to use property mappings. However, underspecification seems most appropriate for shared-feature syncretisms as well as for nonshared-feature syncretisms where the syncretized form is a default (e.g., the 2<sup>nd</sup> singular indicative syncretism in Section 3.2). Property mappings are appropriate to analyze nonshared-feature syncretism where the syncretized form is not a default (e.g., syncretism of {pl pres ind} and {pl imp}) and to analyze metasyncretisms (e.g., syncretism of {1sg past indic} and {3sg past indic}).

#### **4 Comparing DM and PFM: Restrictiveness**

##### *4.1 Introduction*

Although DM and PFM2 have different fundamental assumptions, they organize the grammar in a broadly similar fashion in the analysis of syncretisms. Each theory encodes the syntactic features/properties relevant to a node and has a way of changing those features/properties. Each theory also encodes the morphological features/properties associated with an exponent, and the exponent itself. These parallels are shown in Table 7.

Table 7: Parallels between DM and PFM

	<b>DM</b>	<b>PFM</b>

<b>Syntactic features</b>	Syntactic feature bundle	Property set of content paradigm
<b>Alteration of syntactic features</b>	Impoverishment	Property mappings
<b>Features of exponents (possibly underspecified)</b>	Features of Vocabulary Items	Property constraint of realization rule
<b>Exponent</b>	Morphophonological portion of Vocabulary Item	Non-stem output of realization rule

Syncretism in general is about the relationship between the first row of Table 5 (syntactic features) and the last row of Table 5 (exponents). Both theories demonstrate two ways in which this relationship can be indirect: through explicit modification of the syntactic features/properties, and through underspecification of the features associated with exponents.

However, the theories diverge in how they alter the syntactic properties/features: DM only reduces features, but PFM2 can reduce property sets, add to property sets, or change the identity of a property, seemingly allowing for any two syntactic bundles/content cells to be syncretized. This difference in restrictiveness between the two theories has been much commented on in the literature (see e.g., Noyer 1998, Bobaljik 2002, Baerman, Brown, and Corbett 2005, among many others). In the remainder of the paper, I build on these

previous observations and explore two key questions on restrictiveness. In Section 4.2, I investigate whether the restrictions on syncretism that DM predicts truly hold. The answer is fairly clearly negative, and I present several DM responses to the relevant challenging facts. In Section 4.3, I investigate whether there are no empirical restrictions on syncretism, as predicted by PFM2. While it has been claimed that there are few to no such restrictions (see e.g., Baerman, Brown, and Corbett 2005), I argue that certain formal restrictions may have been missed because they were not specifically looked for.

Before launching in, it is essential to note an additional apparent difference between DM and PFM: differences in assumptions about the syntax and/or about the nature of morphosyntactic features. For example, assumptions about the mechanics of syntax can result in the same empirical phenomenon being treated as a syncretism in one theory, but not in another. Old English verbs do not express person distinctions in the plural, but Stump (this vol.) does not consider this a syncretism; instead, the content cells for plural verbs simply lack person properties (the person properties are not relevant for the semantic interpretation of these verbs, and only properties which are relevant to syntax and semantics are present in content paradigms (Stump (this vol.): fn. 10)). In contrast, in Chomskyan syntactic theory, a verb (better: functional head) will generally receive all the phi features from an argument that it agrees with. Thus, a verb that has any phi features (e.g., number) will have person features in the syntax, and the lack of exponence of person features morphologically is therefore a syncretism

that the grammar must generate. This is exactly what is assumed in the analysis of Hupa object agreement in Section 2.

Additionally, it is controversial how far morphosyntactic categories should be featurally decomposed, if at all (see e.g., Calabrese 2008 for an example of decomposing case features, see Baerman, Brown and Corbett 2005, Müller 2008 Bachrach and Nevins 2008 for general discussion), whether features are privative or binary (see e.g., Harley and Ritter 2002 and Harbour 2013 for opposing viewpoints) and what the identity of certain features even is (see e.g., Nevins 2011, Harbour 2014 on how to characterize number features). Assumptions about feature composition directly affect analyses of syncretism; questions like whether masculine and feminine have any features in common will lead to different analyses of syncretism depending on how they are answered.<sup>17</sup>

Although assumptions about the syntax and about the representation of morphosyntactic features have important consequences, they are less relevant here since they cross-cut DM and PFM2. Even though DM and PFM2 are conventionally associated with particular syntactic assumptions (e.g., DM with minimalism) and with particular assumptions about morphosyntactic features/properties (e.g., PFM2 with a flat, relatively un-decomposed feature structure), these associations are not ironclad. It would be possible to perform a

---

<sup>17</sup> Syncretisms are even sometimes used as empirical evidence in favor of certain solutions to these questions (see e.g., Frampton 2002, Watanabe 2013 on person features).

PFM2 analysis with more articulated features, and it would be possible to perform a DM analysis where person is not part of the syntactic feature bundle of a plural agreement probe (see Harley 2008 on distinguishing between true syncretism and the lack of a feature in the syntax in DM). So, although it is important to keep these assumptions in mind when comparing any two analyses of syncretism (within or across theories), I do not focus on them further.

#### *4.2 DM and Restrictions on Syncretism*

DM predicts that every syncretism in natural language will be either (i) shared-feature syncretism or (ii) nonshared-feature syncretism where the syncretized exponent is a default form.<sup>18</sup> As I showed for Hupa verbal agreement, an underspecification analysis requires that the two syncretized feature bundles (e.g., 1<sup>st</sup> pl object agreement, 2<sup>nd</sup> pl object agreement) have at least one exclusive feature or combination of features in common (e.g., [PL] and [OBJ]): those feature(s) are part of the VI used to uniquely expone both feature bundles (e.g., *noh-* ↔ [PL],[OBJ]). The only way to expone two elements which do not share any features exclusively is to do so with a default VI, as with Amharic determiner syncretism.

---

<sup>18</sup> I do not focus on restrictions about markedness, e.g., whether DM requires syncretism to occur in a marked context or to result in less markedness. See Noyer 1998 and Nevins 2011.

Impoverishment is an analytical tool used to remove conflicting features, and thus to cause feature bundles to share features; then the syncretism across feature bundles can be captured using underspecification of Vocabulary Items. However, it is not possible for Impoverishment to add a feature to a bundle to make it shared, or to change the identity of a feature so that it becomes shared across bundles. DM therefore predicts there will be no natural language syncretisms that require feature-adding or feature-changing operations.<sup>19</sup>

Prima facie, these predictions are not borne out, as has been noticed in the syncretism literature (see e.g., Stump 2001, Baerman 2004, 2005, Stewart and Stump 2006, Müller 2008). In this section, I sketch out the DM responses to two syncretisms that seem to fly in the face of the predictions: English participles and Somali determiners. I conclude with an assessment of the consequences of these proposals.

English past participles (*Lee has **eaten** the cronut*) and passive participles (*The cronut was **eaten***) display a syncretism known as a morpheme (Aronoff 1994), “a systematic morphological syncretism which does not define a (syntactically or semantically) natural class” (Trommer this vol.). Even though these participles are completely distinct syntactically and semantically, they are formally identical across a wide range of exponents, as seen in (18).

(18) Irregular English Past/Passive Participles

---

<sup>19</sup> Assuming the standard version of Impoverishment where it only deletes features. See fn. 8.

a. i. beat – beat – beat-en	break – broke – brok-en
drive – drove – driv-en	fall – fell – fall-en
ii. put – put – put	bind – bound – bound
sing – sang – sung	come – came – come
b. dwell – dwel-t – dwel-t	send – sen-t – sen-t
leave – lef-t – lef-t	buy – bough-t – bough-t
c. i. prove – prove-d – prov-en	do – di-d – do-ne
ii yell – yell-ed – yell-ed	tell – tol-d – tol-d

It is difficult to account for this morpheme in DM. The two syntactic feature bundles do not have any features in common that are exclusive to them (that would not also pick out, say, infinitives), and the participial forms are not the default form for (nonfinite) verbs in English.<sup>20</sup>

However, Trommer (this vol.) develops a successful DM analysis of the English participial morpheme that hinges on the ability to insert features at a syntactic feature bundle. Trommer draws on a morphological operation that has been independently proposed in DM: redundancy rules (also known as dissociated node/feature insertion; see e.g., Embick and Noyer 2007). Redundancy rules

---

<sup>20</sup> One possible Impoverishment analysis would be for the VI expressing the syncretism to expone a feature that is shared by the passive and past participles (say, [-FIN]), and to have Impoverishment delete that feature from any other bundle. This type of analysis is sketched in Trommer (this vol.), and he concludes it is a potential variant on the parasitic features analysis.



cannot change pre-specified features, but they can add a feature to syntactic feature bundle during the post-syntactic morphology. Trommer refers to the added features as “parasitic features” because they are inserted post-syntactically by a morphological operation but they are conditioned by the syntactic context.

Assume the following syntactic feature bundles for the participles.

- (19) a. [-FIN],[+PAST],[F1]...  
 b. [-FIN],[+PASS],[F2]...

Trommer proposes a post-syntactic redundancy rule that adds a feature [+P] to these bundles.

- (20) a. [ ] → [+P] / [-FIN],[+PASS],[F1]...  
 b. [ ] → [+P] / [-FIN],[+PASS],[F2]...

Then, Impoverishment deletes any feature that co-occurs with [+P] to prevent any the two bundles from being differentiated at Vocabulary Insertion (I treat [F] as a variable over features).

- (21) [F] → [+P]  
 [+P]

As a result, the two feature bundles are identical, and they will be exponed in the same way, e.g., as *-ed* in the default, in *-en* in the context of  $\sqrt{\text{EAT}}$ , etc.

In general, complicated syncretic patterns can often be addressed in DM by appealing to other formal mechanisms (like redundancy rules) or by reanalyzing the patterns. For example, morphological polarity is a type of syncretism described by Hetzron (1967:184) as “[given] two grammatical

categories...X and Y, and two corresponding exponents...A and B, then value X can sometimes be assumed by A, while B denotes Y; and sometimes value X is expressed by B and then it is necessarily A that represents Y.” This is shown in (22) for Somali determiners where *ka-* seems to express masculine in the singular and feminine in the plural, and *ta-* seems to express feminine in the singular and masculine in the plural.

(22) Somali Determiners

	<u>Singular</u>	<u>Plural</u>
Masc	<i>ka-</i>	<i>ta-</i>
Fem	<i>ta-</i>	<i>ka-</i> (Saeed 1999:112)

This type of syncretism is challenging for DM because the syncretized feature bundles (e.g., masculine plural and feminine singular) have no features in common.

However, it has been proposed that polarity can be captured in DM with alpha variables that range over feature values (see e.g., Harbour 2013; see also Béjar and Hall 1999, Lahne 2007 and Albright and Fuß 2012:266 for other DM approaches to polarity). Additionally, many cases of polarity may have alternative analyses (see e.g., Albright and Fuß 2012:266-267). In the case of the Somali data in (22), Lecarme (2002) and Kramer (2015) demonstrate that many plurals in Somali are not polaric (e.g., some masculine nouns are associated with *ka-* in both the singular and plural), and that the correlations between gender and

plural marking are best analyzed as the plural markers themselves determining the gender of the nominal.<sup>21</sup>

Overall, then, some of the most challenging patterns of syncretism for DM may be reducible to other effects (e.g., the nature of Somali plurality) or capable of being analyzed via additional formal mechanisms (e.g., parasitic features, alpha variables).<sup>22</sup> On the plus side, DM does not collapse in the face of data that does not fit its predictions – there are clear ways to proceed and have the framework accommodate the facts. On the negative side, the addition of extra mechanisms undermines DM’s restrictiveness. If formal mechanisms can be added to account for complex patterns, then the theory becomes less restrictive (see e.g., discussion in Trommer (this vol.)). In particular, allowing for parasitic features to account for syncretism brings DM one step closer to PFM’s property mappings – DM can now add features as well as take them away. However, DM cannot yet change features entirely, like the DM property mapping of dissonance, and it is an

---

<sup>21</sup> Similarly, Baerman (2007b) points to Neo-Aramaic agreement markers as a clear example of polarity but they may be amenable to an alternative analysis if some different syntactic assumptions are adopted, e.g., the analysis in Doron and Khan 2012.

<sup>22</sup> Another alternative is that “syncretisms” which are difficult to capture in DM are not in fact syncretisms, but instead are either accidental homophony or featurally-deficient syntactic feature bundles. See Nevins 2011 (p. 435) for an example of this type of argumentation, Harley 2008 on how to distinguish between syncretisms and syntactic feature bundle restrictions, and Albright and Fuß 2012 on how to distinguish between syncretisms and accidental homophony.

important question for future research whether feature-changing rules/operations are required to account for all types of syncretism.<sup>23</sup>

The middle ground here is that additional DM mechanisms can come into play to account for complex syncretisms, but these mechanisms must be independently motivated in a robust way. They cannot be posited for the sheer sake of accounting for some unusual syncretisms. For example, Trommer (this vol.) makes a clear case for parasitic features being necessary for a variety of morphological situations in DM. As DM continues to be tested on more and more complex syncretism patterns, the plausibility of any necessary formal mechanisms will contribute to determining the plausibility of DM's analysis of syncretism generally.

#### *4.3 Are there Restrictions on Syncretism?*

---

<sup>23</sup> Bidirectional syncretism (Baerman, Brown, and Corbett 2005), where two different forms are used to express the same syncretism, at first seems like a good candidate for a feature-changing rule. For example, in Bonan (Mongolic), accusative case is syncretic with genitive for nouns and dative for pronouns (Harley 2008:271). However, Harley (2008) develops a DM analysis of this syncretism that relies on both underspecification (for nouns) and Impoverishment (for pronouns), and that appeals to a case feature hierarchy to resolve the competition for Vocabulary Insertion. This analysis is another instance of how DM plus additional formal tools, in this case a feature hierarchy, can capture syncretisms that seem to require powerful feature-adjusting rules (although see Stump 2001:281 n.3 on how feature hierarchies introduce unrestrictiveness). See also Zwicky (2000) and Wunderlich (2004) on how directionality effects may be epiphenomenal.

DM makes predictions about (im)possible syncretisms, but it has been widely observed that PFM does not impose any restrictions on syncretism (see e.g., Noyer 1998, Bobaljik 2002, Baerman, Brown, and Corbett 2005:164).<sup>24</sup> In particular, in Stump (this vol.), property mappings can add, remove or change properties, and more than one property mapping can apply to a content cell. So, for example, PFM2 would allow for two disjoint content cell property sets (e.g., {subjunctive pl} and {3 sg past indicative}) to syncretize through a complex series of property mappings (e.g., for the first property set, change [subjunctive] to [indicative], change [pl] to [sg], add [3], and add [past]). This allows for a straightforward approach to nonshared-feature syncretisms that do not rely on a default (e.g., morphemes), but it opens the door for any two features to syncretize.

A recent strand of typological work on syncretism (Baerman 2005, Baerman, Brown, and Corbett 2005, Müller 2008, Albright and Fuß 2012), building on broad cross-linguistic investigations of syncretism, has argued that this state of affairs is essentially correct: it is most likely possible to syncretize any feature(s) with any other(s), modulo basic morphosyntactic plausibility (e.g., nominal inflection class does not syncretize on verbal agreement because

---

<sup>24</sup> Stump (2001:239) proposes a Feature Ranking Principle that constrains syncretism. It stipulates that each language has a hierarchy of morphosyntactic features for non-natural class syncretisms and features lower on the hierarchy are syncretized in the context of features higher in on the hierarchy. However, it is unclear whether this hierarchy persists into PFM2.

inflection class is not a feature that ever participates in agreement). For example, Albright and Fuß (2012) comment "...while there are some clear preferences concerning the contexts and features/feature values affected by syncretism, it seems that there are few, if any, clear generalizations concerning what is possible and what is not" (261). If this is correct, PFM2 has a major advantage since it can generate all kinds of syncretisms freely.

However, I submit that the question of whether there are robust restrictions on syncretisms is difficult to answer. It is inevitable that the theoretical assumptions of the investigator affect the investigation; what theory one is assuming, even if tacitly, determines partially what is being looked for and how the results are interpreted. For example, Baerman, Brown, and Corbett 2005 observe that, in a three-gender language with masculine, feminine and neuter genders, all possible types of syncretism are attested in the plural: masculine/feminine, feminine/neuter and masculine/neuter. However, all the examples of masculine/feminine syncretism cited there and throughout the typological literature (Corbett 1991, 2000, 2006, 2012, Aikhenvald 2004, Heine 1982, Surrey Syncretisms Database<sup>25</sup>) are from languages with natural-gender-

---

<sup>25</sup> In the Surrey Syncretisms Database, all gender pairs like fem/masc (e.g., fem/male) were checked, and none of the attested hits were true counterexamples. The attested hits were all either from languages with two genders (Classical Arabic, Kashmiri, Somali) or from languages where gender assignment is determined by human-ness (as expected). Slovenian is the only exception,

based assignment systems, where masculine and feminine nouns share a human feature or animacy feature. Relevant languages with this pattern include Karata (Dagestania; Baerman, Brown, and Corbett 2005:82; Corbett 1991:9 on the gender system), Kannada (Dravidian; Sridhar 1990), and Laal (unclassified, spoken in Chad; Baerman, Brown, and Corbett 2005, Boyeldieu 1982).

This pattern is predicted by the basic approach to (non-morphomic) syncretism in DM. Masculine and feminine gender do not share a feature that could be referred to in an underspecified VI, or that could be left over after Impoverishment. Moreover, if the neuter is assumed to be the default gender in three-gender languages (see e.g., Kramer 2015), then this cannot be a nonshared-feature syncretism where the syncretized form is a default. However, if both masculine and feminine gender nouns are always human, then there is a shared feature that can be referred to by a VI or left over after gender features are eliminated. It remains to be seen whether all cases of masculine/feminine syncretism will be in the context of a shared feature, but the main point is that since shared features were not “on the radar” of Baerman, Brown, and Corbett 2005, a promising restriction on this type of syncretism may have gone unnoticed. If a framework does not make predictions about how syncretism should behave, then it is less likely to be able to identify any such restrictions in the data.

---

but given its complex morphology it is likely that some other feature (e.g., inflection class) might unite masculine and feminine genders when syncretism does occur.

Overall, then, typological work has not found any restrictions on syncretism, which supports PFM2. However, restrictions may have been overlooked since confirming DM predictions was (very understandably) not the highest priority of this research. The way forward, then, is for proponents of restrictive theories like DM to clearly identify restrictions/predictions on syncretism and conduct typological investigations to test them. These results can then be triangulated with earlier work, and a richer cross-linguistic picture will hopefully unfold.

#### *4.4 Conclusion*

DM and PFM2 are similarly structured in how they analyze syncretism, but they are very different in their predictions about restrictions on syncretism. DM is more restrictive, which has the benefit of easy falsifiability, whereas PFM2 is very powerful, which has the benefit of excellent empirical coverage. Digging deeper, though, both theories have weaker parts. While additional mechanisms can be added to DM to explain unpredicted syncretisms, these mechanisms need to be carefully motivated because they make the theory less restrictive. As for PFM, its unconstrained-ness may cause critical empirical patterns to be missed. In general, the field would benefit if practitioners of both theories “step across the aisle” and engage the other on their traditional turf. PFM2 and other non-DM theoreticians could admit the possibility of alternative analyses of complex



syncretic patterns, and assist in the assessment of such analyses. In turn, DM theoreticians could engage with the typological literature on syncretism more systematically (a notable exception here is the work of Gereon Müller) and conduct thorough typological research using their theoretical perspective.

As I observed in the Introduction (and as has been observed widely in previous morphological research), the advancement of morphological theory requires a careful weighing of restrictiveness versus empirical coverage. However, I have shown how syncretism facilitates the fragmentation of this somewhat facile dichotomy into deeper, more productive questions like: How do we assess the modifications made to a restrictive theory when its restrictions are found not to hold universally? How do we fairly and thoroughly assess whether there are empirical restrictions on a phenomenon? I think the answers are, respectively, “strictly, requiring independent motivation” and “by investigating it from multiple theoretical vantage points” and hopefully future research will move us closer to addressing these questions systematically and to better understanding the nature of syncretism itself.

## **References**

- Aikhenvald, Alexandra. 2004. Gender and noun class. In *Morphologie*, Wolfgang Kesselheim et al. (eds.), 1031-1044. Berlin: de Gruyter.
- Albright, Adam & Eric Fuß. 2012. Syncretism. In *The Morphology and Phonology of Exponence*, Jochen Trommer (ed), 236-288. Oxford: OUP.

- Aronoff, Mark. 1994. *Morphology by Itself: Stems and Inflectional Classes*.  
Cambridge, MA.: MIT Press.
- Arregi, Karlos & Andrew Nevins. 2012. *Morphotactics: Basque Auxiliaries and the Structure of Spellout*. New York, NY: Springer.
- Bachrach, Asaf & Andrew Nevins. 2008. Introduction: approaching inflectional identity. In *Inflectional Identity*, Asaf Bachrach & Andrew Nevins (eds), 1-28. Oxford: OUP.
- Baerman, Matthew. 2004. Directionality and (un)natural classes in morphology. *Language* 80: 807-827.
- Baerman, Matthew. 2005. Typology and the formal modeling of syncretism. In *Yearbook of Morphology 2004*, Geert Booij & Jaap van Marle (eds), 41-72. Dordrecht: Springer.
- Baerman, Matthew. 2007a. Syncretism. *Language and Linguistics Compass* 1: 539-551.
- Baerman, Matthew. 2007b. Morphological reversals. *Journal of Linguistics* 43: 33-61.
- Baerman, Matthew, Dunstan Brown & Greville G. Corbett. 2005. *The Syntax-Morphology Interface: A Study of Syncretism*. Cambridge: CUP.
- Béjar, Susana & Daniel Currie Hall. 1999. Marking markedness: the underlying order of diagonal syncretisms. Paper presented at the Eastern States Conference on Linguistics, University of Connecticut

- Bobaljik, Jonathan David. 2002. Syncretism without paradigms: remarks on Williams 1981, 1994. In *Yearbook of Morphology 2001*, Geert Booij & Jaap van Marle (eds), 53-85. Dordrecht: Foris.
- Bobaljik, Jonathan David. 2011. Distributed Morphology. Ms., University of Connecticut.
- Bonet, Eulalia. 1991. Morphology After Syntax: Pronominal Clitics in Romance. PhD dissertation, Massachusetts Institute of Technology.
- Boyeldieu, Pascal 1982. *Deux études laal (Moyen-Chari, Chad)*. Berlin: Dietrich Reimer.
- Calabrese, Andrea. 2008. On absolute and contextual syncretism: remarks on the structure of case paradigms and on how to derive them. In *Inflectional Identity*, Asaf Bachrach & Andrew Nevins (eds), 156-205. Oxford: OUP.
- Calabrese, Andrea. 2011. Investigations on markedness, syncretism and zero exponence in morphology. *Morphology* 21: 283-325.
- Corbett, Greville G. 1991. *Gender*. Cambridge: CUP.
- Corbett, Greville G. 2000. *Number*. Cambridge: CUP.
- Corbett, Greville G. 2006. *Agreement*. Cambridge: CUP.
- Corbett, Greville G. 2012. *Features*. Cambridge: CUP.
- Doron, Edit and Geoffrey Khan. 2012. The typology of morphological ergativity in Neo-Aramaic. *Lingua* 122. 225-240.
- Embick, David & Rolf Noyer. 2001. Movement operations after syntax. *Linguistic Inquiry* 32: 555-595.

- Embick, David & Rolf Noyer. 2007. Distributed morphology and the syntax/morphology interface. In *The Oxford Handbook of Linguistic Interfaces*, Gillian Ramchand & Charles Reiss (eds), 289-324. Oxford: OUP.
- Frampton, John. 2002. Syncretism, impoverishment, and the structure of person features. In *CLS 38: The Main Session. Papers from the 38th Meeting of the Chicago Linguistic Society*, Mary Andronis, et al. (eds), 207-222. Chicago, IL: Chicago Linguistic Society.
- Golla, Victor. 1970. Hupa Grammar. PhD dissertation, University of California, Berkeley.
- Halle, Morris. 1997. Distributed morphology: impoverishment and fission. In *MIT Working Papers in Linguistics 30: Papers at the Interface*, Benjamin Bruening, et al. (eds), 425-449. Cambridge, MA: MITWPL.
- Halle, Morris & Alec Marantz. 1993. Distributed morphology and the pieces of inflection. In *The View from Building 20*, Ken Hale & Samuel Jay Keyser (eds), 111-176. Cambridge, MA: MIT Press.
- Harbour, Daniel. 2003. The Kiowa case for feature insertion. *Natural Language and Linguistic Theory* 21: 543-578.
- Harbour, Daniel. 2013. "Not plus isn't not there": bivalence in person, number and gender. In *Distributed Morphology Today*, Ora Matushansky & Alec Marantz (eds), 135-150. Cambridge, MA: MIT Press.

- Harbour, Daniel. 2014. Paucity, abundance, and the theory of number. *Language* 90: 185-229.
- Harley, Heidi. 2008. When is a syncretism more than a syncretism? Impoverishment, metasyncretism and underspecification. In *Phi Theory*, Daniel Harbour, David Adger & Susana Béjar (eds), 251-294. Oxford: OUP.
- Harley, Heidi & Rolf Noyer. 1999. Distributed morphology (State-of-the-Article). *Glott International* 4: 3-9.
- Harley, Heidi & Elizabeth Ritter. 2002. Person and number in pronouns: a feature-geometric analysis. *Language* 78: 482-526.
- Heine, Bernd. 1982. African noun class systems. In *Apprehension: Das Sprachliche Erfassen von Gegenständen I: Bereich und Ordnung der Phänomene*, H. Seiler & C. Lehmann (eds.), 189-216. Tübingen: Narr.
- Hetzron, Robert. 1967. Agaw numerals and incongruence in Semitic. *Journal of Semitic Studies* 12: 169-197.
- Jakobson, Roman. 1936. Contribution to the general theory of case: general meanings of the Russian Cases. In *Roman Jakobson: Russian and Slavic Grammar*, 1984, Linda R. Waugh & Morris Halle (eds), 59-103. Berlin: Mouton. 59–103.
- Kramer, Ruth. 2009. Definite markers, phi-features, and agreement: a morphosyntactic investigation of the Amharic DP. PhD dissertation, University of California, Santa Cruz.

- Kramer, Ruth. 2015. *The Morphosyntax of Gender*. Oxford: OUP.
- Lahne, Antje. 2007. On deriving polarity effects. In *1 2 Many: One-to-Many Relations in Grammar*, J. Trommer & A. Opitz (eds), 1-22. Institut für Linguistik: Universität Leipzig.
- Layton, Bentley. 2011. *A Coptic Grammar*. 3<sup>rd</sup> ed. Wiesbaden: Harrassowitz.
- Lecarme, Jacqueline. 2002. Gender “polarity:” theoretical aspects of Somali nominal morphology. In *Many Morphologies*, Paul Boucher & Marc Plénat (eds), 109-141. Somerville, MA: Cascadilla Press.
- Leslau, Wolf. 1995. *Reference Grammar of Amharic*. Wiesbaden: Harrassowitz.
- Müller, Gereon. 2004. A Distributed Morphology approach to syncretism in Russian noun inflection. In *Proceedings of Formal Approaches to Slavic Linguistics 12*, Olga Arnaudova, et al. (eds), 353-374. Ann Arbor, MI: Michigan Slavic Publications.
- Müller, Gereon. 2007. Extended exponence by enrichment: argument encoding in German, Archi and Timacua. *Penn Working Papers in Linguistics* 13: 253-266.
- Müller, Gereon. 2008. Review of Baerman, Brown and Corbett 2005. *Word Structure* 1: 199-232.
- Nevins, Andrew. 2011. Marked targets versus marked triggers and impoverishment of the dual. *Linguistic Inquiry* 42: 413-444.
- Noyer, Rolf. 1998. Impoverishment theory and morphosyntactic markedness. In *Morphology and its Relation to Phonology and Syntax*, Steven G.

- LaPointe, Diane K. Brentari, & Patrick M. Farrell (eds), 264-285.  
Stanford, CA: CSLI.
- Pullum, Geoffrey K. & Arnold M. Zwicky. 1986. Phonological resolution of syntactic feature conflict. *Language* 62: 751-773.
- Saeed, John. 1999. *Somali*. Amsterdam: Benjamins.
- Sridhar, S.R. 1990. *Kannada*. London: Routledge.
- Stewart, Thomas & Gregory T. Stump. 2007. Paradigm function morphology and the morphology-syntax interface. In *The Oxford Handbook of Linguistic Interfaces*, Gillian Ramchand & Charles Reiss (eds), 383-421. Oxford: OUP.
- Stump, Gregory T. 1993. On rules of referral. *Language* 69: 449-479.
- Stump, Gregory T. 2001. *Inflectional Morphology: A Theory of Paradigm Structure*. Cambridge: CUP.
- Stump, Gregory T. 2002. Morphological and syntactic paradigms: arguments for a theory of paradigm linkage. In *Yearbook of Morphology 2001*, Geert Booij & Jaap van Marle (eds), 147-180. Dordrecht: Foris.
- Stump, Gregory T. 2006. Heterocclisis and paradigm linkage. *Language* 82: 279-322.
- Stump, Gregory T. 2007. A non-canonical pattern of deponency and its limitations. In *Deponency and Morphological Mismatches*, Matthew Baerman, et al. (eds), 71-95. Proceedings of the British Academy 145. Oxford: OUP.

- Stump, Gregory T. 2012. The formal and functional architecture of inflectional morphology. In *Morphology and the Architecture of Grammar: Online Proceedings of the Eighth Mediterranean Morphology Meeting*, Angela Ralli et al. (eds), 245-70.  
[https://geertbooij.files.wordpress.com/2014/02/mmm8\\_proceedings.pdf](https://geertbooij.files.wordpress.com/2014/02/mmm8_proceedings.pdf)
- Stump, Gregory T. this vol. Paradigms at the interface of a lexeme's syntax and semantics with its inflectional morphology.
- Trommer, Jochen. this vol. A postsyntactic morpheme cookbook.
- Watanabe, Akira. 2013. Person-number interaction: Impoverishment and natural classes. *Linguistic Inquiry* 44: 469-492.
- Williams, Edwin. 1994. Remarks on lexical knowledge. *Lingua* 92: 7-34.
- Wunderlich, Dieter. 2004. Is there any need for the concept of directional syncretism? In *Explorations in Nominal Inflection*, L. Gunkel, G. Müller & G. Zifonun (eds), 373-395. Berlin: Mouton de Gruyter.
- Zwicky, Arnold. 2000. Describing syncretism: rules of referral after fifteen years. Presentation at the 26<sup>th</sup> Annual Meeting of the Berkeley Linguistics Society, University of California, Berkeley.