Towards a Theory of Morphology as Syntax

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Abstract

Phenomena traditionally thought of as morphological can be accounted for in terms of syntactic operations and principles, hence bringing forth questions that traditional morphology fails to ask (for instance, concerning the licensing of empty morphemes). The language faculty contains no specific morphological component, nor any post-syntactic morphological operations.

Keywords

1 Introduction

In this paper, we discuss the relationship between syntax and morphology. In particular, we are interested in the question of the extent to which morphological generalizations can be accounted for in terms of syntactic operations and principles. The thesis to be defended is the following (see Caha 2020: 8 for a very similar statement concerning Nanosyntax):

(1)   Morphology as Syntax (MaS)
      Morphological generalizations are accounted for in terms of syntactic operations and principles. There is no morphological component in Universal Grammar (UG), nor are there post-syntactic morphological operations.

MaS is a program for research, which has as an underlying assumption that separation of morphology and syntax cannot be achieved in any natural way. In other words, it is impossible to analyze morphology in isolation from syntax. For example, it is impossible to understand syncretism in a verbal paradigm without an analysis of the syntax of the language (see section 7 on Spanish for a case study).

MaS is a consequence of the Strong Minimalist Thesis (SMT) of Chomsky 2000, which states that "language is an optimal solution to legibility conditions", and therefore a theory lacking a morphological component is plausibly more optimal. Furthermore, just like the operations and principles of syntactic theory can be subject to scrutiny from the point of view of the SMT (for example, D-Structure, S-Structure, traces, c-command, labels, etc.), proposed operations and principles of morphology can be subject to scrutiny from the point of view of MaS.

For syntactic theory, we assume the broad outlines of minimalist syntax, recently formalized by Collins and Stabler (2016). The basic assumptions are sketched in section 2. Nevertheless, we are not making the claim that all morphological generalizations can be reduced to syntactic principles as they are understood today. Rather, new insights about syntax can be learned by trying to give syntactic explanations of morphological generalizations.

As for the relationship between phonology and syntax, works such as Dobashi 2020 argue for a particularly close connection between certain aspects of phonology and syntax. Moreover, one can ask more generally if the kinds of structures and constraints found in phonology fall under syntactic theory (cf. Nevins' (2010) account of vowel harmony). For example, can tone spreading in autosegmental phonology be understood in the same terms as successive cyclic movement in syntax? For the purposes of this paper, we put these important issues aside and assume that there is a clear distinction between phonology and syntax, on the grounds that the primitives manipulated in syntax (e.g., formal features such as PL) are distinct from the primitives manipulated in phonology (e.g., [+voiced]).

2 Syntactic Framework

In order to defend (1), the theory of syntax to be employed needs to be discussed. We are assuming the minimalist theory of syntax, as outlined and formalized in Collins and Stabler 2016, the most important assumption being that syntactic objects are combined by Merge:

(2)   For all syntactic objects X and Y, Merge(X,Y) = {X,Y}

In (2), Merge takes two objects and produces an unordered set (but see Kayne 2019b, 2022 which argue for incorporating linear/temporal order into the definition of Merge). For the purposes of this paper, we adopt (2) and leave open the question of how morphological phenomena bear on the issue of whether or not the definition of Merge incorporates linear/temporal order.

There are two subcases of Merge: internal Merge (movement) and external Merge. Internal Merge yields various patterns such as: successive cyclic movement, roll-up movement, remnant movement, smuggling, etc. Movement is subject to locality conditions such as the Minimal Link Condition, Relativized Minimality (MLC/RM) and Phase Impenetrability Condition (PIC). All syntactic operations are subject to economy conditions.

The set of syntactic objects includes the set of lexical items (morphemes). We assume that lexical items can be defined as follows (for alternatives in the spirit of MaS see Collins 2017: 61, Kayne 2016):

(3)   LI: {FF, PHON},
       where FF is a set of formal features and PHON is a sequence of phonological segments.

This definition excludes late insertion (since it assumes that lexical items pair up FF and PHON pre-syntactically (in the lexicon)) and raises important questions including: Can PHON = ∅ (the empty sequence)? What is the set of formal features of UG? What kinds of sets of FF are allowed? Can they be of arbitrary complexity? Kayne (2005: 212) (see also Bobaljik 2012: 212) formulates the following hypothesis (see Collins 2022 for discussion):

(4)   Principle of Decompositionality
       UG imposes a maximum of one interpretable syntactic feature per lexical item.

The question of formal features in the definition of lexical items is very closely related to the question of hierarchies of functional projections in the clause (e.g., the left periphery, the adverb hierarchy, extended projection of lexical categories, and other hierarchies discussed in the cartography literature). The syntactic hierarchies interact with syntactic constraints on movement to yield cross-linguistic variation. A striking example of this kind of work is from Cinque (2005) who argues that a version of Greenberg's Universal 20 (Greenberg 1966) can be accounted for in terms of a universal hierarchy of modifiers combined with restrictive theories of linear order and movement. Greenberg's Universal 20 states (see Cinque 2005: 315):

(5)   "(a) that in prenominal position the order of demonstrative, numeral, and adjective (or any subset thereof) conforms to the order Dem > Num > A, and (b) that in postnominal position the order of the same elements (or any subset thereof) conforms either to the order Dem > Num > A or to the order A > Num > Dem."

In MaS, one would expect such syntactic argumentation to carry over into the domain of morpheme order. In fact, Cinque (2015) argues that the order of Mood, Tense and Aspect morphemes can be accounted for by similar principles.

On syntactic approaches to morpheme order see (amongst others) Baker 1985, 1988, Buell et al. 2014, Julien 2007, Kayne 2010a, Koopman 2005, 2017, Muriungi 2014, and Zyman and Kalivoda 2020. On syntactic approaches to clitic order see Kayne 1994, Ordóñez 2002, Săvescu-Ciucivara 2009, Shlonsky, to appear, and Terzi 1999. On MaS compliant ways of analyzing agent nominalizations see Collins 2006, Kayne 2008, Fábregas 2012, Ntelitheos 2012, and Gotah and Lee 2022.

Once a syntactic object is formed, it must be spelled out at the phase level. So, we assume that there is an operation Transfer that has two components $Transfer_{PF}$ and $Transfer_{LF}$.

(6)   For any syntactic object SO,
       $Transfer(SO) = \{Transfer_{PF}(SO), Transfer_{LF}(SO)\}$

Transfer is often referred to as Spell-Out in the syntax literature. Spell-Out has the function of establishing a linear/temporal order of the morphemes, which we will assume conforms to the Linear Correspondence Axiom (Kayne 1994). Spell-Out also determines which occurrences of a syntactic object are spelled out (e.g., in remnant movement).

3 Empty Elements

Related to Spell-Out is the issue of when a morpheme can fail to be pronounced (or alternatively, when a morpheme can be spelled out as zero). Any morpheme that is unpronounced must either be lexically zero (specified in the lexicon as having no phonological form) or syntactically licensed as unpronounced in some way or the other. The issue of zero morphemes and how they are licensed is of great importance in the MaS framework. Here, we briefly survey the relevant syntactic principles.

First, if a constituent X undergoes movement (internal Merge), typically only the highest occurrence is spelled out (although some care is needed to get Spell-Out to work correctly for remnant movement, see Collins and Stabler 2016; also Nunes 2004).

Second, if a constituent X has an identical antecedent, in many cases it may undergo ellipsis (see Van Craenenbroeck and Merchant 2013 for a survey; see section 4.1 below for an example).

Third, there are many effects falling under the Doubly Filled Comp Filter in syntax. These are situations where the head and the specifier of a maximal projection cannot be filled overtly at the same time (see Collins 2007; Koopman 2000: 350–353; Koopman and Szabolcsi 2000). The version from Collins 2007 is given below (Edge(X) includes both the head and the specifier of X):

(7)   No Crowding Condition
      a. Edge(X) must be phonetically overt.
      b. The condition in (a) applies in a minimal way so that either the head, or the specifier, but not both, are spelled-out overtly.

Fourth, Kayne (2006) proposes that the specifier of a phase is in general not spelled-out. He has used that principle to explain the presence of a null MUCH in expressions like *enough money* (not **enough much money* or **much enough money* as opposed to *too much money* or *so much money*).

Fifth, Emonds (1987) proposes the Invisible Category Principle which regulates, amongst other things, the distribution of null prepositions in English. The principle states:

(8)   Invisible Category Principle
      "A closed category B with positively specified features C_i may remain empty throughout a syntactic derivation if the features C_i (save possibly B itself) are all alternatively realized in a phrasal sister of B."

On a possibly related note, Choi and Harley (2019: 1346, 1347, footnote 32) observe that it is often the case when X triggers suppletion of some other head Y, X is realized as a zero allomorph.

Sixth, there are null pronominals of various sorts, including PRO, pro and implicit arguments, each with its own licensing conditions (on null pro in object position, see Rizzi 1986; on the syntactic status of implicit arguments, see Bhatt and Pancheva 2017 and Collins 2022; on null subjects, see Holmberg 2005, 2010). See also Carstens 1991, 1993 on diminutive morphology in Bantu, and in particular the Zero-Morpheme Licensing Principle.

There are many other areas where people have proposed empty elements in syntax. Among other principles, the MaS proposal is that empty morphemes in what is traditionally called morphology are licensed in the same way as other empty categories in syntax.

4 Examples

In this section, we will go over a number of short case studies illustrating some analyses that conform to MaS, and some that do not.

4.1 Ellipsis

Caha (2013: 1023) argues that Case Attraction in Classical Armenian should be analyzed as ellipsis (see also Erschler 2018 for another relevant case study).

(9)   a. N-ABL   N-GEN   (underlying)
     b. N-ABL   N-GEN AGR=ABL   (case agreement)
     c. N-ABL   N-~~GEN~~ AGR=ABL   (ellipsis)

In (9a) there is a head noun and a complement noun. Normally the nominal complement is in the genitive. However, if the head noun has dative, ablative or instrumental case, the complement can optionally show up in that case instead. Caha argues that there is a process of case agreement between the complement and head noun (see (9b)), followed by ellipsis of the case marker of the complement noun (see (9c)). The reason why ABL can trigger ellipsis of GEN is that ABL actually contains GEN structurally. See Caha 2013 for details.

Two aspects of this explanation deserve comment from the perspective of MaS. First, ellipsis under identity with an antecedent is a mechanism that is independently needed in syntax (in the spell-out of syntactic objects). Therefore, Caha's explanation of Case Attraction falls squarely in the MaS program. Second, just like in current discussions of ellipsis in syntax, there is no need to assume that any structure has been removed in (9c) (unlike impoverishment in DM). Rather, GEN is simply unpronounced under identity with a subpart of ABL.

4.2 Infintival [e] in Italian

In Italian, the infinitive normally ends in the vowel [e]. Cardinaletti and Shlonsky (2004: 529) note that "when a pronoun appears as an enclitic to the infinitive, [e] is obligatorily absent." The examples below are from pages 529, 537:

(10) a. Lo   vorrei   vedere.
       it   would.want   see
      'I would want to see it.'
     b. Vorrei veder(*e)lo.

(11) a. Lo   sono   andato   a   trovare.
      him   am   gone   to   visit
      'I went to visit him.'
     b. Sono andato a trovarlo.

As shown in these examples, when the clitic is before the finite verb, the infinitive ends in [e]. When the clitic follows the infinitive, [e] is absent. Cardinaletti and Shlonsky (2004: 532) propose that:

(12) "[e] is an independent morpheme and not part of the nonfinite inflection, which is [r]."

Adopting this assumption, we propose that the final [e] heads a functional projection whose specifier may host a clitic moved from a lower position, if there is one (for related proposals about clitics see Săvescu-Ciucivara 2009). For example, in (10b) and (11b), the clitic *lo* has moved into Spec FP. By the No Crowding Condition in (7), the head of F is not pronounced. In other words, the empty F is licensed by the NCC, one of the principles in section 3. If the clitic precedes the finite verb, then Spec FP is either empty or contains a trace, and so F is pronounced as shown in (10a) and (11a).

How this account relates to clitic clusters (as in Săvescu-Ciucivara 2009), we leave to further work.

4.3 Contextual Restrictions and Double Plurals

Kramer (2016a: 544) analyzes double plurals in Amharic. The possible plurals of the word for "baby" are given below:

(13) a. his'an-at   (p. 528)
      b. his'an-otʃtʃ   (p. 544)
      c. his'an-at-otʃtʃ   (p. 544)

In her framework, the irregular plural (13a) is a little *n* with an uninterpretable [+pl] feature. The regular plural (13b) is formed by adding Num which has an interpretable [+pl] feature. The double plural in (13c) combines the irregular and regular plurals.

The structure of the double plural is given in (14):

(14) $[_{NumP} [_{nP} [Root] n] Num]$

To account for the data in (13), Kramer assumes the following vocabulary items:

(15) a. Num, [+pl] $\longleftrightarrow$ -otʃtʃ   (regular)
      b. n, [+pl] $\longleftrightarrow$ -at / {HIS'AN,….}   (irregular)

Kramer elaborates (p. 530) "Overall, since every nominal has a regular plural and there are double plurals, I conclude that regular and irregular plural morphology do not compete for insertion in Amharic; in other words, they do not occupy the same syntactic head (Num). Instead, I propose a split analysis of number: the 'regular' plural suffix is the realization of Num[+pl] and irregular plural morphology is the realization of n[+pl]…".

How are such contextual restrictions as those in (15) handled in MaS? Contextual restrictions on morphemes define where a morpheme can be merged into a syntactic object. They are to be understood in terms of relations familiar from syntax (c-selection, s-selection, l-selection, and the relation between the parts of idiomatic expressions). In other words, there is no such thing as morphology-specific contextual restrictions on morphemes (or on vocabulary insertion). Since syntactic selectional restrictions obey locality conditions, by MaS, contextual restrictions on morphemes will obey the same locality conditions (for a survey of existing theories, see Choi and Harley 2019). However, the general goal should be to reduce or eliminate the use of such restrictions as much as possible, since each restriction is a stipulation.[1]

It is sometimes easy to translate DM style vocabulary items into MaS style lexical items (morphemes). From the point of view of MaS, the regular plural

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[1] See Matthews and Yip 2011: 124 "...classifiers are not merely selected by individual nouns, but can be applied meaningfully to classes of nouns and to new situations."

in Amharic has the following lexical entry (on morphology and selection, see Fabb 1988):

(16) LI: {-otʃtʃ, Num[+pl]} selects nP

If the positions of NumP and nP in the functional sequence were part of UG, the selectional restriction ("selects nP") would not need to be listed in the lexical item in (16).

On the other hand, the irregular plural *at-* is more restricted and can be defined as follows:

(17) LI: {-at, n[+pl]} selects {hɨs'an 'baby',…}

The restriction is that the irregular plural *-at* can only appear with one of a small number of roots. Such a restriction is similar to the lexical restrictions found in the following phrases in English:

(18) a. by dint of
      b. to keep tabs on

In both cases, there is a lexical item that can appear in a very specific lexical context. In (18a), the noun *dint* only appears in the expression *by dint of*, and in no other expression. In other words, there is lexical selection, where *dint* lexically selects the preposition *by* (if *dint* is a noun, the presence of the preposition *of* is predictable and does not need to be accounted for by lexical selection). Similarly, *tabs* (in the relevant sense) can only appear with *keep* in (18b). We assume in this case that the idiom chunk *tabs* is lexically selecting the verb *keep*.

In MaS, (16) and (17) are lexical items, and are not inserted post-syntactically. Rather, they are merged together with the root or the noun to form plurals in Amharic. The syntactic derivation of the double plural in Amharic is given in (19). As is customary, the lexical items in the derivation are represented by their phonological forms:

(19) a. Merge(hɨs'an, -at)   =   {hɨs'an, -at}
         (satisfying the selectional requirements of *-at*)
      b. Merge({hɨs'an, -at}, -otʃtʃ)   =   {{hɨs'an, -at}, -otʃtʃ}
         (satisfying the selectional requirements of *-otʃtʃ*)
      c. Spell-Out({{hɨs'an, -at}, -otʃtʃ})   =   hɨs'an-at-otʃtʃ

Since Kramer assumes that the n and Num heads appear finally, the result of (19b) would be spelled out as in (19c) (perhaps involving several instances of internal Merge), with no late insertion.

4.4 Allomorphy

A case related to Amharic irregular plurals arises with English irregular plurals. Consider the DM treatment of the irregular plural *ox-en* given by Embick (2015: 171–172):

(20) a. [+pl]   ←→   -en/{OX, CHILD, …}
      b. [+pl]   ←→   Ø/{FISH, MOOSE…}
      c. [+pl]   ←→   /-z/

The vocabulary items in (20) represent a late insertion analysis for the English plural. The late insertion analysis of the English irregular plural is considered a foundational example for the analysis of allomorphy in the DM literature, see for example McGinnis 2017: 395, Bonet and Harbour 2012: 196, Bobaljik 2012: 7, Embick and Noyer 2007: 298–299. In section 5 below, we will argue that late insertion is incompatible with MaS, but apart from such, there are other problems with (20).

For example, there is a difference between irregular and regular plurals in compounds (see also Pinker 1999: 179 who cited the examples of "draft horse, mule and oxen power"):

(21) a. ox cart, oxen cart
      b. dog sled, *dogs sled

While both forms in (21a) seem to be more or less acceptable, *dogs sled* in (21b) is sharply degraded, which suggests that the regular plural and the irregular plural -*en* do not occupy the same syntactic position, contrary to the claim of the analysis in (20). Rather, -*en* occupies a lower position than -*s*. Following Collins (2018), we propose that -*en* occupies an inner plural position (PL1) and -*s* occupies an outer plural position (PL2). Only the inner plural is compatible with noun compounds. In other words, English has an inner and outer plural, in a way similar to Amharic (discussed in the previous section).

A similar contrast holds for derivational morphology:

(22) a. *childrenize, oxenize*
      b. **kidsize, *oxesize, *cowsize*

The examples in (22a) seem relatively acceptable, but the examples in (22b) are sharply unacceptable. Just as in the case of compounds, such a contrast suggests two different positions for the two different plural markers (-*en* versus the regular plural -*s*). Only a plural noun with an inner plural can take a derivational suffix like -*ize*.

Our split plural analysis of *ox-en* is similar to Punske and Jackson's (2017: 268) analysis of English plurality: "In English, the higher position Num encodes individuation while the lower position, n, encodes general plurality." They show convincingly that only lower plurals appear in compounds.[2]

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[2] We unsurprisingly take compounds in general to be put together by the syntax by Merge, with non-transparent compounds being akin to phrasal idioms; certain compounds will contain silent elements (cf. Lees 1963 and Levi 1978), as in the case of *a New Yorker* plausibly being "a New York LIVE IN -er"; the extent to which Chinese compounds as discussed by Liao (2014) are similar needs to be determined, with Huang 2015 being particularly relevant.

In a MaS style analysis, the relevant lexical items are given below:

(23) a. LI_1:   {PL2, -s}   selects X
       b. LI_2:   {PL1, -en}   selects *ox*

In these lexical items, X stands for some projection in the DP that is as high as PL1P (so that there is an inner and an outer plural position). If the positions of PL1P and PL2P2 in the functional sequence were part of UG, there would be no need for the selectional restrictions to be listed in the lexical items in (23).

What is the relationship between PL1 and PL2? There are three possibilities. First, we could adopt Kramer's (2016a) analysis that the outer plural is interpretable while the inner plural is uninterpretable. In that case, PL2 = PL and PL1 = uPL. Second, it could be that they each are interpretable with different semantic values, as suggested by Punske and Jackson (2017) (recall, individuation versus general plurality). Third, it could be that they each are interpretable, but with exactly the same semantic values. In that case, PL1 = PL2 = PL. We will return to this issue in a moment.

These morphemes do not compete with one another, in that many speakers allow both kinds of plurals:

(24) a. oxes
       b. oxen

As Pinker (1999: 52) notes: "Most Americans meet *oxen* mainly in writing, and commonly say *oxes* instead." On the DM analysis in (20), such a state of affairs illustrated in (24) would be completely unexpected. Since the irregular plural *-en* is more specific (having a more specific context for vocabulary insertion), it should block the regular plural. However, under the split plural analysis, the data in (24) is completely expected, just like in Amharic both the irregular and regular plurals are possible (see (13)). See Collins 2018 for more discussion of the theoretical significance of morphological doublets for the issue of late insertion.

A piece of evidence for the split plural analysis is the following contrast:

(25) a. ??oxens
       b. *oxesen

While both forms seem unacceptable, the order of the plural markers in (25a) is much better than (25b). This contrast is consistent with our analysis in that the order in (25a) reflects the order of inner plural before outer plural. A future project would be to investigate whether *oxens* appears in internet searches, and whether the form exists in different English dialects. A related question is whether the double plural *childrens* appears in child English.

The relation between outer plural *-s* and inner plural *-en* has much in common with the relation between negative *un-* and negative *in-*, with ??*oxens* versus

oxesen parallel to ?*unineffective* versus *inuneffective*. The parallel suggests that *un-* is an outer negation and *in-* is an inner negation.[3]

Nonetheless, if there is an inner plural and an outer plural, then why is the double plural (25a) not perfectly acceptable, and what accounts for the difference between English and Amharic double plurals (see (13) above)? One possibility is that the inner plural in Amharic is uninterpretable (following Kramer (2016a)), but both the inner plural and outer plural are interpretable in English (they both have plural semantics). If both the inner plural and outer plural are interpretable in English, (25a) might be relatively unacceptable by Full Interpretation, in the sense of Chomsky 1986: 98.

Although it is unclear that the above analysis can serve as a general model for contextual allomorphy, one important general assumption is the following (see (3) for the definition of morpheme):

(26) Contextual allomorphy involves two or more different morphemes.

In the example at hand, it is not that the irregular *-en* and the regular *-s* are competing for insertion in a given position. Rather, each of the morphemes heads its own functional projection. In general, on the approach to contextual allomorphy outlined in this paper, in any given case there will be at least four questions to answer. Consider the example of *oxen* again, which gives rise to these relevant questions:

(27) a. Why can *ox* combine with *-en*?
      b. Why can *ox* combine with *-s*?
      c. Why can *fox* not combine with *-en*?
      d. Why can *fox* combine with *-s*?

Here are the answers to those questions: (a) *ox* can combine with *-en* because *ox* satisfies the contextual restrictions of *-en* (see (23b)). (b) *ox* can combine with *-s* because *ox* satisfies the contextual restrictions of *-s* (see (23a)). (c) *fox* cannot combine with *-en* because *fox* does not satisfy the contextual restrictions of *-en*. (d) *fox* can combine with *-s* because *fox* satisfies the contextual restrictions of *-s*.

The mechanisms of late insertion, competition, blocking and the elsewhere condition will play no role in the answers to these questions, since our proposal is

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[3] For a proposal to the effect that the prefixal (vs. suffixal) character of *un-* and *in-* is explainable, see Kayne 2017.
   The Cantonese negative prefix *m-* discussed by Matthews and Yip (2011: 44) may be less close to English *un-* or *in-*, at least when prefixed to verbs, than it is to the silent NOT that Kayne and Moro (to appear) associate with negative verbs like *deny*.
   The fact that Cantonese and Mandarin have prefixal counterparts *hó-* and *ke-*, respectively, of English suffixal *-able*, as Matthews and Yip (2011: 44) and Liao (2014: 7) point out, might reflect a single irreducible parametric difference; alternatively, Cantonese and Mandarin have, via the use of silent elements, something closer to *able-to-be-V-ed* than to *V-able*.

that such post-syntactic mechanisms are not part of UG and are irrelevant to the analysis of contextual allomorphy.

A reviewer asks whether the account for *oxen/oxes* is applicable to plural suppletion (e.g. *mouse/mice*)? Collins (2018) suggests that irregular plurals are analyzed as *man*-F-PL (where F is a covert version of the *-en* one finds in *oxen*). The covert morpheme F triggers a stem vowel change (*man* to *men*) and also blocks the final regular plural. A difference between *oxen/oxes* and **childs*, **mans*, **womans* is that the latter are all unacceptable. Collins (2018) suggests that these can be understood as *child*, *man* and *woman* lexically selecting the irregular plural morpheme F (where *ox* would not select an irregular plural). Further analysis of these cases will not be pursued here.

On an account of suppletion (e.g., **goed* versus *went*) in the spirit of MaS see Kayne 2018, 2019a, 2020, to appear.[4]

4.5 Insertion of dissociated morphemes

Distributed Morphology postulates the post-syntactic insertion of morphemes, referred to as ornamental or dissociated morphemes in the DM literature (see Embick 2015: 65). See also Choi and Harley's (2019: 1331) discussion of insertion of dissociated morphemes as node-sprouting. Embick and Noyer (2007: 309) add that:

(28) "As a working hypothesis, it has been suggested that only features irrelevant to semantic interpretation, that is, features that are not interpretable, can be introduced at PF…"
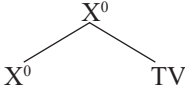
Morphemes that are introduced this way include agreement nodes (AGR), case features, theme vowels (for verbs), class markers (for nominal declension classes) (see also Halle and Marantz 1993: 135), and honorific morphemes (Choi and Harley 2019).

An example of a dissociated morpheme in Italian is raised by Calabrese (2015: 74) (see also Harris 1998: 44):

(29) "Thematic Vowels (TV) are special morphological elements adjoined to certain functional heads in morphological structure by the rule in (11)."

That rule is given below:

(30) X^0 →

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4   That kind of approach to suppletion may be extendable to Cantonese positive vs. negative existential *yáuh/móuh*, as discussed by Matthews and Yip (2011, sect. 14.3), though with the latter containing negative *m-*, in a way that recalls both (the *n-* of) Russian *net* and Mandarin *méiyǒu*, as discussed by Li and Thompson (1981, chap. 12) and Yip and Rimmington (2004, sect. 16.1).)

From the point of view of MaS, the problem with (30) is that it allows morphemes to be combined with other morphemes in a way that is very different from Merge. To put it another way, it posits that something would block such a morpheme from being introduced by Merge in ordinary syntax.
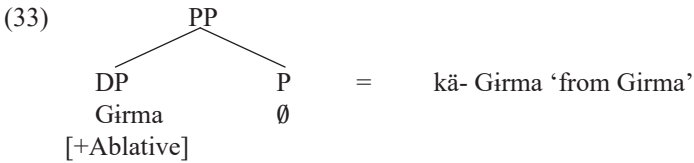
(31) Merge(TV, X^0)

However, when considering (31), it can be observed that (30) is redundant with the syntactic operations of UG. In addition, the rule in (30) is highly specific to the TV morpheme, which in turn raises the question of whether each dissociated morpheme will need its own special rule, greatly complicating particular I-languages, and raising serious questions of explanatory adequacy. Furthermore, (30) raises the question of how such rules vary cross-linguistically. Therefore, it is very different from Merge which is part of UG and able to combine any two syntactic objects. However, Calabrese does not discuss why the more general formulation in (31) would not work, nor how it would have affected his analysis.

A more challenging example of this kind of analysis is offered by Baker and Kramer (2014). They claim that case markers in Amharic ('from', 'to', 'by', 'for') are introduced post-syntactically. Some examples are given below.

(32) a. kä-bet   (p. 150)
          from-house
          'from a house'
      b. kä-tillik'   bet   (p. 150)
          from-big   house
          'from a big house'
      c. bä-zzih   bet   (p. 145)
          in-this   house
          'in this house'
      d. lä-Girma   wändimm   (p. 151)
          to-Girma   brother
          'to Girma's brother'
      e. kä-rädʒdʒim-u   näggade   suk'   (p. 155)
          from-tall-DEF   merchant   shop
          'from the shop of a tall merchant'

In these examples, we adopt the word divisions given by Baker and Kramer. We assume that their description of the distribution of the case markers is correct (see (34) below), based on many complicated facts, concerning the distribution of definite markers and the syntax of relative clauses. Due to space constraints, we will refrain from recapitulating those arguments here.

To handle this kind of data, Baker and Kramer (2014) assume that in these examples there is a null adposition following the noun, which assigns a case feature to its complement.

(33)

```
              PP
            /    \
         DP        P      =      kä- Girma 'from Girma'
        Girma      Ø
      [+Ablative]
```

The case marker itself is inserted post-syntactically by the following rule (m-word = morphological word). A more complicated, recursive version of this rule is needed to handle cases like that of (32e). For brevity's sake, we put the recursive version aside.
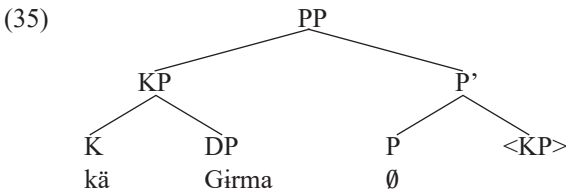
(34) Insertion Rule (Preliminary Version)

If a feature F is to be inserted within constituent X, then attach F to the m-word Z such that Z asymmetrically c-commands all the other m-words in X.

Once again, from the point of view of MaS, the problem with (34) is that it allows morphemes to be combined with other morphemes in a way that is very different from Merge. Moreover, this rule is completely different from the one postulated by Calabrese in (30), raising the question of how many such post-syntactic insertion rules there are. Lastly, (34) is meant to be a rule of post-syntactic case insertion, but relies on the notion of asymmetric c-command which is a purely syntactic relation, again raising the issue of whether the insertion rule should be carried out by syntactic mechanisms.

In formulating an alternative analysis, we adopt from Baker and Kramer 2014 the restriction of the case marker to m-words. We also adopt their idea that there is a null post-position present. However, unlike them, we assume that the case maker and its m-word are combined by Merge: Merge(K, m-word), which in MaS, is the only way to introduce morphemes into a structure. Additionally, there must be a local syntactic relation between the overt case marker K and the null P (see (38) below).

Under these assumptions (and the LCA), the structure in (33) would be replaced by the following:

(35)

```
                      PP
                   /      \
                KP          P'
              /    \       /    \
            K       DP    P      <KP>
           kä      Girma  Ø
```

In this example, the KP is the sister of P'. As for the other examples in (32b–e), they resemble pied-piping:

(36) a. I wonder who she saw.
      b. I wonder whose picture she saw.
      c. I wonder whose brother's picture she saw.

In (36a), the embedded [+Q] complementizer requires a wh-phrase in its specifier, but this requirement can be satisfied under pied-piping as shown in (36b). Accordingly, Kayne (1994: 24) gives the following condition:

(37) The wh-phrase in interrogatives must asymmetrically c-command the [+wh] head.

Adapting this condition to the case at hand, we have:

(38) The KP must asymmetrically c-command the corresponding null preposition P.

In (35), KP asymmetrically c-commands P. Now consider (32d), which has the following structure:

(39) [$_{PP}$ [$_{DP}$ [$_{KP}$ lä- Girma] wändïmm] P']
   'to Girma's brother'

In the specifier (possessor) of the complement of the postposition, the KP c-commands P, just as in pied-piping in (36b) where the possessor *whose* c-commands the [+Q] complementizer. The Amharic example in (32e) is parallel to the case of pied-piping in (36c), where *whose* is the specifier of a specifier.

Due to space restrictions, we are unable to analyze all the complicated examples (some involving relative clauses) discussed by Baker and Kramer. Whether or not our analysis is correct, it links the current set of facts to the general theory of pied-piping.

In summary, MaS holds the following to be true:

(40) There is no post-syntactic insertion of morphemes.

5 Against Late Insertion

The preceding sections have given an overview of a syntactic approach to morphology but the discussion so far leaves open the following question: What is the status of late insertion? That is, is late insertion consistent with the general MaS framework? In this section, we will argue that it is not, by the basic point: Late insertion involves wide ranging formal mechanisms that operate on syntactic structures but are independent of syntactic theory. By assuming early insertion, those mechanisms may be rendered redundant.

Two theories that adopt the assumption of late insertion are Distributed Morphology and Nanosyntax. As Baunaz and Lander (2018: 12) phrased it: "In realizational, late-insertion theories like DM and Nanosyntax, however, sound and meaning are not inherently linked but are separate entities, and it is only when the syntactic derivation reaches a certain point that the meaning is paired with (for some, replaced by) sound." In the remainder of this section, we will focus on DM and leave a discussion of Nanosyntax for future work.

The syntactic operation Merge takes two syntactic objects X and Y and puts them together to form a third syntactic object Z = {X,Y}. This operation can

be looked at in two different ways, corresponding to the two interfaces (CI and SM) that need to interpret the syntactic object formed. From one angle, Merge is combining X and Y so that they can be composed semantically. From another angle, Merge is combining X and Y so that when they are linearized (at Spell-Out), the result is a phonological string determined by the phonological form of X and of Y. In effect, Merge is introducing phonological forms into syntactic objects, so there is no need for extra rules to govern the introduction of phonological forms into terminals.

Late insertion theories do not adopt these assumptions about Merge. In DM, morphemes have no phonological form. They are combined to form syntactic objects (by Merge and a set of post-syntactic operations), and then post-syntactically the terminals (morphemes) are provided with phonological forms by vocabulary insertion. Implementing late insertion theories requires wide ranging and complicated additions to that part of syntactic theory dealing with the spell-out of syntactic objects (the phonology-syntax interface).

As discussed in section 2, Spell-Out incorporates general principles of morpheme order (e.g., the LCA) and principles dealing with the spell-out of occurrences (e.g., in remnant movement). These general Spell-Out principles are also applicable in late insertion theories.

First, there is an independent list of vocabulary items (the Vocabulary) that are defined by the pairing of formal features and phonological forms, which in functional vocabulary alone consists of hundreds such vocabulary items for each I-language. In addition, there is another list of terminals (morphemes) that are combined by Merge. In many cases, the vocabulary items and the terminals will be defined by identical sets of formal features. For example, suppose the English preposition *to* is defined by the formal feature DAT. Then in DM, there will be a terminal DAT as well as a vocabulary item: DAT ←→ *to*. All formal features will appear twice in the grammar: in the terminals and in the vocabulary items.

Each time vocabulary insertion applies to a particular syntactic terminal, every one of those vocabulary items will have to be checked to see if it matches the terminal. That is, the features of the vocabulary items need to be a subset of the formal features of the terminal (the Subset Principle, see Embick and Noyer 2007: 298). If a syntactic object contains 10 terminals (a small tree) and there are 100 vocabulary items (a small Vocabulary) for a particular grammar, then there will be 1,000 operations of checking. Of course, in practice, there may be ways to optimize this search, and to cut down on the total number of operations needed.

Second, once a small subset of matching vocabulary items is selected, they will be ranked according to how well they match the terminal. If there are five matching vocabulary items, the one with the most features wins (the Subset Principle again). So, if V1 matches terminal T with three features and V2 matches T with four features, V2 wins. This means that UG must be able to take two vocabulary items, compare them in terms of size and choose the biggest one. Also, it is clear from

the DM literature that the competition does not just refer to the formal features of the vocabulary item, but also contextual restrictions on vocabulary items (Halle and Marantz 1993: 123). As far as we know, the algorithm which carries out this comparison (in DM) has not been formalized. Are the features and contextual restrictions actually counted or is some other method used? In some cases, where there is a tie, it might be necessary to refer to feature hierarchies (Embick and Noyer 2007: 298, fn. 14), adding another level of complexity and stipulation to the process.

It is important to note here that the mechanism of comparing the size of the feature sets of two different vocabulary items (both of which match a terminal) is completely foreign to syntactic theory. For example, the choice between Merge(X,Y) and Merge(X,Z) is never dependent on how large the feature sets of Y and Z are.

Third, once the winning vocabulary item is determined, its phonological form will be inserted into the terminal, so when the syntactic object is linearized, the phonological features of the vocabulary item are incorporated into the output. Such insertion changes the syntactic object formed (by replacing one of its morphemes with a morpheme specified for phonological form). So, it is important to stipulate that this process lies outside of syntax, which is constrained by the No Tampering Condition (no altering syntactic objects already formed).

Similar remarks hold for other post-syntactic operations like fission, fusion, impoverishment, and post-syntactic insertion of dissociated morphemes. All of these would violate the No Tampering Condition, if they were syntactic operations. In other words, these other operations are not syntactic operations, even though they have syntactic structures as both input and output, which adds a level of complication.

The above remarks demonstrate that late insertion requires wide ranging and powerful formal mechanisms that do not find any basis in syntactic theory. On the contrary, the MaS program adopts early insertion, so that Merge itself (not vocabulary insertion) introduces phonological material into syntactic structures. The hypothesis is that by adopting early insertion, it will be possible to dispense with these non-syntactic formal additions needed to implement late insertion.

This section can be summarized as:

(41) There is no late insertion.

6 Syncretism

In both DM and Nanosyntax, the primary motivation for late insertion is accounting for morphological syncretisms (see Embick and Noyer 2007: 299). Here, we propose a theory of syncretism that does not rely on late insertion:

(42) Syncretism involves a single morpheme being used in two or more different syntactic contexts.

In this definition, morpheme means a pair {FF, PHON} (see (3)).

The assumption in (42) generalizes the approach of Kayne 2010b, in which he analyzes syncretism between dative clitics, locative clitics and others (chapter 6) and syncretism between 1PL object clitics and locative clitics and others (chapter 7). In the cases Kayne discusses, the contexts are defined in part by empty categories.

Here is an example to illustrate how (42) works. Greenberg (1966) states the following two generalizations concerning syncretism:

(43) *Universal 37*. A language never has more gender categories in nonsingular numbers than in the singular.

(44) *Universal 45*. If there are any gender distinctions in the plural of the pronoun, there are some gender distinctions in the singular also.

In English, these generalizations capture the behavior of the third person plural pronouns (*they*, *them*, *their*) which do not show the gender distinctions found in the singular (e.g., *he* versus *she* versus *it*). The question is why there are no masculine and feminine forms parallel to 3PL *they*:

(45)   Masc   Fem

   SG   he   she

   PL   they   they
   PL   *hey   *shey   (* means "does not exist")

In this paper, we outline some preliminary steps towards an analysis of Greenberg's generalization for English in the framework of MaS.

First, we assume *they* is specified for gender (not merely underspecified for gender). One piece of evidence for this assertion is that English does show gender contrasts in the singular: *he*, *she*, *it*. This means that gender is a feature of the English pronominal system, including the plural pronouns (even if it is not realized overtly). A second piece of evidence is that even fairly closely related Indo-European languages have gender contrasts in the plural pronouns (3PL subject clitics in French: *elles* versus *ils*). Assuming a universal functional hierarchy, English would also have to have these features represented in its plural pronouns.

However, there is also some syntactic evidence internal to English:

(46) Every one of them (said about a group of boys) hates himself.

It is well known that a reflexive pronoun in English must match the gender of its antecedent (see for example Collins and Postal 2012 for extensive discussion). Since the reflexive pronoun in (46) is masculine, it implies that its antecedent must also be masculine, and hence that *them* must be specified for gender.

In MaS, we can invoke independently needed syntactic hierarchies of functional projections. In this case, we assume that the syntactic structure of the pronoun *they* is as follows (on the internal structure of pronouns, see Koopman

2000: chapter 3, and also Vanden Wyngaerd 2018, for relevant discussion of gender see Bernstein 1993, Picallo 2008, Kramer 2016b).

(47) $[_{DP}$ D $[_{\#P}$ # $[_{GenP}$ Gen NP]]]

For example, according to Vanden Wyngaerd (2018: 280) (see also Liao 2014: 4), Mandarin plural pronouns transparently involve a plural morpheme: "Some languages form the plural of pronouns with the same morpheme that is used with nouns (or certain noun classes)." The Mandarin forms are given below in (48). Similarly, Matthews and Yip (2011: 45) note that Cantonese plural *-deih* can be added only to pronouns and to *yàhn* 'person'. We take these facts as cross-linguistic evidence for the structure in (47) involving a plural head.

(48)   SG   PL
     1   wo   wo-men
     2   ni   ni-men
     3   ta   ta-men

In (47), since we are dealing with a pronoun, NP is null and D is specified as definite. # is specified as plural and Gen is specified as masculine (see (46)). Now clearly, *they* is bimorphemic: *th-ey*. For example, it is parallel to *th-em* and *th-eir* which are third person pronouns, and also parallel to *th-ese* and *th-ose*, which are demonstratives. We analyze *th-* as a definite determiner because of its presence in the definite determiner *the*. But if *th-* is a definite determiner, then what is *-ey*? Considering that it cannot be gender since it is overt and does not vary between masculine and feminine, we suggest that it is an irregular form of the plural morpheme used in pronouns.

What about gender? We argued in (46) that it is syntactically present. In this case, it must be syntactically present, but phonologically null. Putting these assumptions together, we have the following structures (MASC and FEM are not pronounced, as indicated by the capital letters):

(49) a. $[_{DP}$ th- $[_{\#P}$ -ey $[_{GenP}$ MASC NP]]]
      b. $[_{DP}$ th- $[_{\#P}$ -ey $[_{GenP}$ FEM NP]]]

On this analysis, the 3MPL and 3FPL are syncretic in English, because the two morphemes *th-* and *-ey* are being used in two different contexts defined by the null MASC and FEM morphemes (see (42)). In MaS, this pattern of explanation will hold for all cases of syncretism.

Unlike the singular (e.g., *he/him/his* versus *she/her/her* versus *it*), no gender is realized overtly in 3PL pronouns in English. Why is gender unpronounced here? There are two possible analyses in MaS: (1) Gen is a lexical zero (specified in the lexicon as zero in the context of the plural), (2) Gen has a phonological form (perhaps *he*) that is unpronounced in this particular context. However, the assumption that Gen is lexically specified as zero does not seem sufficiently strong. For example, it would allow an English dialect to show gender distinctions in the

third plural, but as far as we know, there are no such English dialects. And in fact, the syncretism holds more widely across Germanic languages. Therefore, what remains to be understood in this analysis is how the empty GEN morphemes in (49) are licensed syntactically.

We propose that in this case the higher feature (plural number) is licensing the null lower feature (gender). The prediction is that no specific overt gender (e.g., feminine) will license null plural number, which would be the case of pronouns in some language that show a plural distinction in the masculine, but where singular and plural are syncretic in the feminine. For example, in such a language, *she* would be either feminine singular or plural, but *he* would only be masculine singular. As far as we know, this generalization is accurate, but we will leave the exact mechanisms for future work.

7 Metasyncretism

Harris (1998) and Embick (2015: 154) analyze syncretism between 2PL and 3PL in the Latin American Spanish verbal paradigm. As can be seen in the paradigm below, the 2PL and 3PL of the present tense of *hablar* 'to speak' are identical.

(50) *hablar* 'to speak'

	present
1SG	hablo
2SG	habla-s
3SG	habla-Ø
1PL	habla-mos
2PL	habla-n
3PL	habla-n

As Embick (2015: 26) notes: "Latin American Spanish shows only five distinct phonological exponents, with an -n appearing in both the second person plural and third person plural contexts."

Embick (2015: 27) proposes to analyze this syncretism in terms of the following vocabulary item:

(51) [-1, +PL] ⟷ -n

Because of the underspecified nature of the vocabulary item, it can be inserted post-syntactically in both a second person plural terminal and a third person plural terminal.

However, the identity of 2PL and 3PL is not limited to this one paradigm. Rather, as Harris (1998: 31) notes, the syncretism between 2PL and 3PL is pervasive in Latin American Spanish:

(52) "Unlike standard Iberian, Latin American dialects systematically lack second person plural morphology: every semantic/syntactic second person plural item

is realized overtly with third person plural morphology. This generalization is all-inclusive, covering not only all verb inflection but also nominative and object-of-proposition pronouns; long and short possessive adjectives and pronouns; accusative, dative, and reflexive clitic pronouns; etc."

Since the syncretism extends to various paradigms (verbal, clitic and pronominal), it will miss a generalization to analyze it in terms of underspecified vocabulary items. For example, the vocabulary item for -*n* in (51), will not apply to the syncretism between 2PL and 3PL object clitics (e.g., *los* and *las*, for masculine and feminine respectively).

To account for this pervasive syncretism, Harris postulates an impoverishment rule. We present Embick's (2015: 154) version below:

(53) [+/- 2] → Ø [__,+pl]

As Harris (1998) comments, this rule "…removes the feature [2pers] in the context of [+plural], leaving no person feature at all. This is the formal counterpart of 'third person', the default person in Spanish (and perhaps universally). All other features are unaffected; in particular, the features of case, gender and number necessary for realization of overt phonological distinctions in these properties remain intact. It is important to bear in mind that impoverishment is a purely morphological operation; syntactic and semantic representations are not affected by it at all."

From the point of view of MaS, the use of impoverishment rules to capture pervasive syncretisms, like that illustrated above for Latin American Spanish, is problematic in a number of ways.

First, as Harris (1998: 40) points out: "Spell-out transfers syntactic arboreal structures into the Morphology model, where they continue to be subject to syntactic-type operations, among others. Thus, morphological representations and their operations do not necessarily differ radically from their syntactic counterparts."

This quote recognizes the syntactic nature of impoverishment rules. They take syntactic structures (those specified for +2 or -2) and produce new syntactic structures, by removing features. However, such impoverishment rules are not true syntactic rules. Rather they apply post-syntactically. They are not syntactic rules because they do not obey constraints on syntactic computation (e.g., the No Tampering Condition). In effect, adding impoverishment rules introduces a new kind of unconstrained second syntactic component, operating outside of the core syntactic system. This is the general problem of second syntax.

Second, there is an issue of restrictiveness (on which, see Chomsky 1981: 5). What are the constraints on impoverishment rules? Can any combination of formal features be deleted? If not, why not? Are there languages with the following impoverishment rules for verbal paradigms?

(54) a. Delete +1
 b. Delete -1
 c. Delete +2
 d. Delete -2.
 e. Delete +PL
 f. Delete -PL
 g. Delete +1, -PL
 h. Delete +1, +PL
 i. Delete -1, -PL
 j. Delete -1, +PL
 k. Delete +2, -PL
 l. Delete +2, +PL
 m. Delete -2, -PL
 n. Delete -2, +PL

The above rules do not even take into account gender or other proposed features which would add another layer of possible deletions.

In general, if there are n features, there will be 2^n -1 impoverishment rules. For example, if there are five features, there will be 31 impoverishment rules. It thus appears that the operation of impoverishment is unrestrictive unless accompanied by a strong theory of constraints, which was not given in the above sources.

Third, since impoverishment operations have contextual restrictions, there is an issue with ordering. Harris (1998: 42) makes use of ordering between two impoverishment rules to obtain the correct subjunctive verb forms in Spanish. The possibility of ordering impoverishment rules adds further to the unrestrictiveness of the system, since each choice of ordering leads to a new I-language.

Fourth, when there is a pervasive syncretism involved, as in the case of Latin American Spanish, it might reflect a deeper syntactic property of the language. All dialects of Spanish use the third person forms *usted* and *ustedes* to refer to the addressee. In Iberian Spanish, the use of *usted* and *ustedes* correlates with formality. In Latin American Spanish dialects, the use of *ustedes* to express the second person plural is the only option. In those dialects, there are no morphologically second person plural forms (such as the subject pronoun *vosotros*).

Collins and Ordóñez (2021) analyze *usted* and *ustedes* as imposters, in the sense of Collins and Postal 2012. In particular, they analyze *usted* as follows:

(55) Structure of *usted*
    [$_{DP}$ D [TU usted]]

In this structure, there is a null 2SG pronoun TU that is embedded in a 3SG DP whose head noun is *usted* (see Collins and Postal 2012 for a precise structural proposal). Crucially, an overt 2SG pronoun *tu* (or sometimes *vos*) is found in all dialects. As often with proper names, the determiner is null. On this analysis, the

reason why *usted* refers to the addressee is because of the presence of the null 2SG pronoun TU. The reason why *usted* shows 3SG verb agreement is because of the 3SG head noun.

The structure of *ustedes* is parallel, except there is an additional plural morpheme:

(56)   Structure of *ustedes*
   [$_{DP}$ D [TU usted]-s]

The plural morpheme forms the semantic plural of TU, but syntactically it merges with the 3SG [TU usted]. In this case, *ustedes* refers to a plural addressee, but agrees in 3PL with the verb.

On the above account, the pervasive syncretism between 2PL and 3PL in Latin American Spanish is given a purely syntactic analysis. Here are the steps in the argument:

(57)   Syntactic account of meta-syncretism between 2PL and 3PL in Latin American Spanish:
   a. Latin American Spanish dialects lack the 2PL pronoun *vosotros*, the 2PL clitic *os*, and 2PL possessive forms *vuestro/a/os/as*.
   b. It is not necessary to assume that there is a constraint of the form *2PL ruling out these forms, rather the relevant forms simply do not exist.
   c. 2PL and 3PL are syncretic in those dialects because reference to a plural addressee is only expressed with the imposter *ustedes*.
   d. There is no need for an impoverishment operation.

See Collins and Ordóñez 2021 for further detail.

Harley (2008: 255) defines meta-syncretism as "…a syncretism that holds for a particular set of features in a language, regardless of the particular affixes used in any particular instance of the syncretism". The 2PL and 3PL syncretism in Latin American Spanish is a meta-syncretism because it runs across pronouns, clitics, and subject-verb agreement. If the above account of Latin American Spanish can be generalized, we have the following:

(58)   Meta-syncretism is the result of syntactic properties of a language (not morphological impoverishment).

8 Comparison of Theories

In this section, we will give a brief comparison of MaS (Morphology as Syntax) with DM (Distributed Morphology) and NS (Nanosyntax) along several dimensions (for an introduction to Nanosyntax, see Baunaz and Lander 2018). Before examining the differences, it is important to note that all three theories adopt minimalist syntactic assumptions. For example, they all recognize Merge as the syntactic structure building operation. See Stump 2001: chapter 1 for a broader overview of morphological theories.

First, MaS does not have late insertion, contrary to both DM and NS. For example, in DM a terminal (morpheme) will get a phonological form by vocabulary insertion post-syntactically. In MaS, lexical items are defined as a pair of a set of formal features and a phonological form, so the phonological features piggy-back into the syntactic structure when the lexical items are merged. Another related difference is that MaS has no notion of competition, unlike DM (which has the subset principle) or NS (which has the superset principle). As a reviewer points out, it is possible to define a theory with early insertion and competition between morphemes. However, it is also clear that for DM and NS, competition is crucially defined in terms of late insertion.

It is possible to make points about late insertion at a more abstract level. Consider the relation of subset (not proper subset). There are three relations that can hold between two sets based on that relation. A is a subset of B, B is a subset of A, and A and B are equal. These three configurations define three morphological theories: DM is based on the subset relation (for late insertion); NS is based on the superset relation (for late insertion); finally, MaS is based on the equality relation: the formal features of a lexical item are equal to the formal features of a syntactic terminal, because syntactic trees are built by merging lexical items. So, in this sense, DM, NS and MaS constitute a partition of the logical possibilities of Merge based syntax. The different possibilities are illustrated below (A and B are sets of features):

(59) a. A $\subseteq$ B   (subset, Distributed Morphology)
      b. A $\supseteq$ B   (superset, Nanosyntax)
      c. A $=$ B   (equality, Morphology as Syntax)

Second, MaS has no post-syntactic operations. For example, there is no post-syntactic movement of morphemes that one finds in the DM literature. There is also no post-syntactic insertion of dissociated or ornamental morphemes (e.g., theme vowels). Nor are there operations such as impoverishment (or fusion and fission) that operate on syntactic structures and produce syntactic structures, but are not syntactic operations. In this regard, MaS is similar to NS which also eschews such post-syntactic operations (with the exception of late insertion).

Another way of putting the same point is in terms of the expression "syntactic hierarchical structure all the way down" (see Halle and Marantz 1994: 276). Syntactic hierarchical structures are those that are created by syntactic operations (such as Merge) and that obey syntactic principles (such as binary branching). Because of the widespread use of post-syntactic operations (such as fusion, fission, impoverishment and post-syntactic insertion of dissociated morphemes), DM definitely does not fall under this description. For example, suppose we have the structure [X Y], and that an ornamental morpheme Z (e.g., a theme vowel) is inserted post-syntactically to yield [X [Y Z]]. Since [Y Z] is not formed by a syntactic operation, it is not syntax (on the reasonable assumption that only those structures formed by syntactic operations can be characterized as syntactic).

Similarly, only MaS and NS fall under the rubric of "single generative engine". While structure is only formed through Merge in MaS and NS, in DM there is the possibility of forming structure through the post-syntactic insertion of dissociated or ornamental morphemes (sprouting). Therefore, DM cannot be characterized by the expression "single generative engine".

Third, both MaS and DM claim that morphemes bear phonological features. For MaS, the phonological features are specified in the lexicon. For DM, the phonological features are inserted post-syntactically by vocabulary insertion. For NS, late insertion is defined in terms of syntactic phrases. A phrase gets paired up with a phonological form post-syntactically.

The differences are summarized in the following chart:

(60)	**MaS**	**DM**	**NS**
late insertion	no	yes	yes
competition	no	yes	yes
post-syntactic operations	no	yes	no (only late insertion)
morpheme based	yes	yes	no (phrase based)

Actually, from the summary, it can be seen that these four properties define a space of sixteen different Merge-based theories. However, we will leave it to future work to explore the other possible theories, and the relationships between the four properties that define them.

9 Conclusion

In this paper, we have achieved the following. First, we sketched the basic assumptions of MaS, a syntactic approach to analyzing putative morphological generalizations. Next, we illustrated the approach with some examples involving ellipsis, contextual restrictions, allomorphy and post-syntactic insertion of dissociated (or ornamental) morphemes. Then, we argued that MaS does not allow late insertion of phonological material and discussed the implications for theories of syncretism. Afterwards, we argued that the operation of impoverishment is unrestrictive, and at least in one case, not necessary to capture the empirical facts. Lastly, we showed that MaS is one of three logically possible kinds of Merge-based theories of morphology, with the other two logical possibilities being represented by DM and NS.

To help the reader keep all the various assumptions of MaS in mind, we have written up the following cheat sheet:

(61) a. There is no morphological component in UG.
      b. Definition of a morpheme: {FF, PHON}
      c. For all syntactic objects X and Y, Merge(X,Y) = {X,Y}
      d. Contextual restrictions on morphemes are to be understood in terms of relations familiar from syntax (e.g., c-selection, s-selection, l-selection, idioms etc.).
      e. There is no late insertion.

f.   There is no competition (or blocking) between morphemes.
g.   There is no Elsewhere Principle.
h.   Null morphemes are licensed by syntactic principles.
i.   Contextual allomorphy involves two or more different morphemes. (e.g., *-en* is an inner plural morpheme, *-s* is an outer plural morpheme).
j.   Syncretism involves a single morpheme being used in two or more different syntactic contexts.
k.   Meta-syncretism is the result of syntactic properties of a language.
l.   There is no post-syntactic insertion of morphemes.
m. There are no other post-syntactic morphological operations.

Acknowledgments

References

Baker, Mark. 1985. The mirror principle and morphosyntactic explanation. *Linguistic Inquiry* 16. 373–415.

Baker, Mark. 1988. *Incorporation: A theory of grammatical function changing.* Chicago: University of Chicago Press.

Baker, Mark & Ruth Kramer. 2014. Rethinking Amharic prepositions as case markers inserted at PF. *Lingua* 145. 141–172.

Baunaz, Lena & Eric Lander. 2018. Nanosyntax: The basics. In Lena Baunaz, Karen De Clerq, Liliane Haegeman & Eric Lander (eds.), *Exploring Nanosyntax* 4–56. Oxford: Oxford University Press.

Bernstein, Judy. 1993. The syntactic role of word markers in null nominal constructions. *Probus* 5. 5–38.

Bhatt, Rajesh & Rouyana Pancheva. 2017. Implicit arguments. In Martin Everaert & Henk van Riemsdijk (eds.), *The Blackwell companion to syntax*, 1–35. Malden, MA: Blackwell.

Bobaljik, Jonathan. 2012. *Universals in comparative morphology: Suppletion, superlatives and the structure of words.* Cambridge: MIT Press.

Bonet, Eulàlia & Daniel Harbour. 2012. Contextual allomorphy. In Jochen Trommer (ed.), *The morphology and phonology of exponence*, 195–235. Oxford: Oxford University Press.

Buell, Leston, Mariame Sy & Harold Torrence. 2014. The syntax of mirror principle violations in Wolof. In Carson T. Schütze & Linnaea Stockall (eds.), *Connectedness papers by and for Sarah VanWagenen, UCLA working papers in linguistics* 18, 71–101. http://phonetics.linguistics.ucla.edu/wpl/issues/wpl18/papers/buellsytorr.pdf.

Caha, Pavel. 2013. Explaining the structure of case paradigms by the mechanisms of Nanosyntax: The classical Armenian nominal declension. *Natural Language and Linguistic Theory* 31. 1015–1066.

Caha, Pavel. 2020. Nanosyntax: Some key features. Ms., Masaryk University, Brno.

Calabrese, Andrea. 2015. Irregular morphology and athematic verbs in Italo-Romance. *Isogloss* [Special issue]. 69–102.

Cardinaletti, Anna & Ur Shlonsky. 2004. Clitic positions and restructuring in Italian. *Linguistic Inquiry* 35. 519–557.

Carstens, Vicki. 1991. *The morphology and syntax of determiner phrases in Kiswahili*. Los Angeles: University of California, Los Angeles dissertation.

Carstens, Vicki. 1993. On nominal morphology and DP structure. In Sam A. Mchombo (ed.), *Theoretical aspects of Bantu grammar*. Stanford, CA: CSLI, Stanford University.

Choi, Jaehoon & Heidi Harley. 2019. Locality domains and morphological rules. *Language and Linguistic Theory* 37. 1319–1365.

Chomsky, Noam. 1981. *Lectures on government and binding*. Dordrecht: Foris.

Chomsky, Noam. 1986. *Knowledge of language*. New York: Prager.

Chomsky, Noam. 2000. Minimalist inquiries. In Roger Martin, David Michaels & Juan Uriagereka (eds), *Step by step*, 89–155. Cambridge, MA: MIT Press.

Cinque, Guglielmo. 2005. Deriving Greenberg's Universal 20 and its exceptions. *Linguistic Inquiry* 36(3). 315–332.

Cinque, Guglielmo. 2015. Again on tense, aspect, mood morpheme order and the "mirror principle". In Peter Svenonius (ed.), *Functional structure from top to toe*, 232–265. Oxford: Oxford University Press.

Collins, Chris. 2006. A Note on derivational morphology. Ms., New York University.

Collins, Chris. 2007. Home sweet home. In Lisa Levinson & Oana Savescu-Ciucivara (eds.), *NYU working papers in linguistics* 1. http://ling.auf.net/lingbuzz/001967.

Collins, Chris. 2017. Merge(X,Y) = {X,Y}. In Leah Bauke, Andreas Blümel & Erich Groat (eds.), *Labels and roots*, 47–68. Boston: De Gruyter Mouton.

Collins, Chris. 2018. The logic of contextual allomorphy. Ms., New York University.

Collins, Chris. 2022. A merge-based approach to argument structure. Ms., New York University.

Collins, Chris & Francisco Ordóñez. 2021. Spanish *usted* as an imposter. *Probus* 33. 249–269.

Collins, Chris & Paul Postal. 2012. *Imposters*. Cambridge, MA: MIT Press.

Collins, Chris & Edward Stabler. 2016. A formalization of minimalist syntax. *Syntax* 19. 43–78.

Craenenbroeck, Jereon van & Jason Merchant. 2013. Ellipsis phenomena. In Marcel den Dikken (ed.), *The Cambridge handbook of generative syntax*, 701–745. Cambridge: Cambridge University Press.

Dobashi, Yoshihito. 2020. *Externalization: Phonological interpretations of syntactic objects*. New York: Routledge.

Embick, David. 2015. *The morpheme: A theoretical introduction*. Berlin: De Gruyter Mouton.

Embick, David & Rolf Noyer. 2007. Distributed morphology and the syntax-morphology interface. In Gillian Ramchand & Charles Reiss (eds.), *The Oxford handbook of linguistic interfaces*, 289–324. Oxford: Oxford University Press.

Emonds, Joseph E. 1987. The invisible category principle. *Linguistic Inquiry* 18. 613–632.

Erschler, David. 2018. Suspended affixation as morpheme ellipsis: Evidence for Ossetic alternative questions. *Glossa* 3(1). 12, 1–41.

Fabb, Nigel. 1988. English suffixation is constrained only by selectional restrictions. *Natural Language and Linguistic Theory* 6. 527–539.

Fábregas, Antonio. 2012. Evidence for multidominance in Spanish agentive nominalizations. In Myriam Uribe-Etxebarria & Vidal Valmala (eds.), *Ways of structure building*, 66–92. Oxford: Oxford University Press.

Gotah, Selikem & Soo-Hwan Lee. 2022. Negation in Ewe (Tongugbe) agent nominalization. Ms., New York University.

Greenberg, Joseph. 1966. Some universals of grammar with particular reference to the order of meaningful elements. In Joseph Greenberg (ed.), *Universals of language*, 73–113. Cambridge, MA: MIT Press.

Halle, Morris & Alec Marantz. 1993. Distributed morphology and the pieces of inflection. In Kenneth Hale & Samuel J. Keyser (eds.), *The view from Building 20*, 111–176. Cambridge, MA: MIT Press.

Halle, Morris & Alec Marantz. 1994. Some key features of distributed morphology. In Andrew Carnie, Heidi Harley & Tony Bures (eds.), *Papers on phonology and morphology, MIT working papers in linguistics* 21, 275–288. Cambridge, MA: MIT Working Papers in Linguistics.

Harley, Heidi. 2008. When is syncretism more than a syncretism? In Daniel Harbour, David Adger & Susan Béjar (eds.), *Phi-theory: Phi-features across modules and interfaces*, 251–294. Oxford: Oxford University Press.

Harris, James. 1998. Spanish imperatives: Syntax meets morphology. *Journal of Linguistics* 34. 27–52.

Holmberg, Anders. 2005. Is there a little pro? Evidence from Finnish. *Linguistic Inquiry* 36. 533–564.

Holmberg, Anders. 2010. Null subject parameters. In Theresa Biberauer, Anders Holmberg, Ian Roberts & Michelle Sheehan (eds.), *Parametric variation: Null subjects in minimalist theory*, 88–124. Cambridge: Cambridge University Press.

Huang, C.-T. James. 2015. On syntactic analyticity and parametric theory. In Audrey Li, Andrew Simpson & Wei-Tien Dylan Tsai (eds.), *Chinese syntax in a cross-linguistic perspective*. New York: Oxford University Press.

Julien, Marit. 2007. On the relation between morphology and syntax. In Gillian Ramchand & Charles Reiss (eds.), *The Oxford handbook of linguistic interfaces*, 209–238. Oxford: Oxford University Press.

Kayne, Richard. 1994. *The antisymmetry of syntax*. Cambridge, MA: MIT Press.

Kayne, Richard. 2005. *Movement and silence*. Oxford: Oxford University Press.

Kayne, Richard. 2006. On parameters and on principles of pronunciation. In Hans Broekhuis, Norbert Corver, Riny Huybregts, Ursula Kleinhenz & Jan Koster (eds.), *Organizing grammar: Linguistic studies in honor of Henk van Riemsdijk*, 289–299. Berlin: Mouton de Gruyter (reprinted in Kayne 2010b).

Kayne, Richard. 2008. Antisymmetry and the lexicon. In Jeroen van Craenenbroeck & Johan Rooryck (eds.), *Linguistic Variation Yearbook* 8, 1–31. Amsterdam:

John Benjamins (also in Anna Maria di Sciullo & Cedric Boeckx (eds.). 2011. *The biolinguistic enterprise: New perspectives on the evolution and nature of the human language faculty*, 329–353. Oxford: Oxford University Press.) (reprinted in Kayne 2010b).

Kayne, Richard. 2010a. Toward a syntactic reinterpretation of Harris and Halle (2005). In Reineke Bok-Bennema, Brigitte Kampers-Manhe & Bart Hollebrandse (eds.), *Romance languages and linguistic theory 2008: Selected papers from 'Going Romance' Groningen 2008*, 145–170. Amsterdam: John Benjamins (reprinted in Kayne 2010b).

Kayne, Richard. 2010b. *Comparisons and contrasts*. Oxford: Oxford University Press.

Kayne, Richard. 2016. The silence of heads. *Studies in Chinese Linguistics* 37. 1–37.

Kayne, Richard. 2017. Antisymmetry and morphology: Prefixes vs. suffixes. In Clemens Mayr & Edwin Williams (eds.), *Festschrift für Martin Prinzhorn, Wiener Linguistische Gazette* 82, 145–161. https://wlg.univie.ac.at/fileadmin/user_upload/p_wlg/822017/Kayne_wlg.pdf.

Kayne, Richard. 2018. Toward an understanding of apparent suppletion in Romance pronominal possessives. *Probus* 30. 251–276.

Kayne, Richard. 2019a. What is suppletion? On *goed and on *went* in Modern English. *Transactions of the Philological Society* 117. 434–454.

Kayne, Richard. 2019b. The place of linear order in the language faculty. *Linguistic Analysis* 42. 441–472.

Kayne, Richard. 2020. A note on the silent GO that underlies an instance of apparent suppletion in Spanish. *Isogloss* 6/4. 1–12.

Kayne, Richard. 2022. Antisymmetry and externalization. *Studies in Chinese Linguistics* 43. 1–20.

Kayne, Richard. To appear. On a more demanding approach to suppletion. In Giuliano Bocci, Daniele Botteri, Claudia Manetti & Vincenzo Moscati (eds.), *Issues in comparative morpho-syntax and language acquisition*. Oxford: Oxford University Press.

Kayne, Richard & Andrea Moro. To appear. A note on zero and silent negation.

Koopman, Hilda. 2000. *The syntax of specifiers and heads*. London: Routledge.

Koopman, Hilda. 2005. Korean (and Japanese) morphology from a syntactic perspective. *Linguistic Inquiry* 36. 601–633.

Koopman, Hilda. 2017. A note on Huave morpheme ordering: Local dislocation or generalized U20? In Gautam Sengupta, Shruti Sircar, Madhavi Gayathri Raman & Rahul Balusu(eds.), *Perspectives on the architecture and the acquisition of syntax*, 23–47. Singapore: Springer Nature.

Koopman, Hilda & Anna Szabolcsi. 2000. *Verbal complexes*. Cambridge, MA: MIT Press.

Kramer, Ruth. 2016a. A split analysis of plurality: Number in Amharic. *Linguistic Inquiry* 47. 527–559.

Kramer, Ruth. 2016b. The location of gender features in syntax. *Language and Linguistics Compass* 10. 661–677.

Lees, Robert B. 1963. *The grammar of English nominalizations*. Bloomington: Indiana University.

Levi, Judith N. 1978. *The syntax and semantics of complex nominals*. New York: Academic Press.

Li, Charles N. & Sandra A. Thompson. 1981. *Mandarin Chinese: A functional reference grammar*. Berkeley: University of California Press.

Liao, Wei-Wen Roger. 2014. Morphology. In C.-T. James Huang, Y.-H. Audrey Li & Andrew Simpson (eds.), *The handbook of Chinese linguistics*, 3–25. Oxford: Wiley Blackwell.

Matthews, Stephen & Virginia Yip. 2011. *Cantonese: A comprehensive grammar*, 2nd edn. New York: Routledge.

McGinnis, Martha. 2017. Distributed morphology. In Andrew Hippisley & Gregory Stump (eds.), *The Cambridge handbook of morphology*. Cambridge: Cambridge University Press.

Muriungi, Peter Kinyua. 2014. Phrasal movement in the Bantu verbal complex: Deriving affix scope and order in Kîîtharaka. *Syntax* 17. 21–39.

Nevins, Andrew. 2010. *Locality in vowel harmony*. Cambridge, MA: MIT Press.

Ntelitheos, Dimitrios. 2012. *Deriving nominals: A syntactic account of Malagasy nominalizations*, vol. 3. Leiden: Brill.

Nunes, Jairo. 2004. *Linearization of chains and sideward movement*. Cambridge, MA: MIT Press.

Ordóñez, Francisco. 2002. Some clitic combinations in the syntax of Romance. *Catalan Journal of Linguistics* 1. 201–224.

Picallo, M. Carme. 2008. Gender and number in Romance. *Lingue e Linguaggio* 1. 47–66.

Pinker, Steven. 1999. *Words and rules: The ingredients of language*. New York: Basic Books.

Punske, Jeffrey & Scott R. Jackson. 2017. The bifurcated nature of plural: Reconsidering evidence from English compounds. In Julia Nee, Margaret Cychosz, Dmetri Hayes, Tyler Lau & Emily Remirez (eds.), *Proceedings of the 43rd Meeting of the BLS*, 261–283. Berkeley, CA: Berkeley Linguistics Society

Rizzi, Luigi. 1986. Null objects in Italian and the theory of pro. *Linguistic Inquiry* 17. 501–557.

Săvescu-Ciucivara, Oana. 2009. *A syntactic analysis of pronominal clitic clusters in Romance: The view from Romanian*. New York: New York University dissertation.

Shlonsky, Ur. To appear. Rescaffolding the bundle in Afroasiatic inflection: Tamazight and Hebrew. *Brill's Journal of Afroasiatic Languages and Linguistics*.

Stump, Gregory T. 2001. *Inflectional morphology: A theory of paradigm structure*. Cambridge: Cambridge University Press.

Terzi, Arhonto. 1999. Clitic combinations, their hosts, and their ordering. *Natural Language and Linguistic Theory* 17. 85–121.

Vanden Wyngaerd, Guido. 2018. The feature structure of pronouns: A probe into multidimensional paradigms. In Lena Baunaz, Karen De Clerq, Liliane Haegeman & Eric Lander (eds.), *Exploring Nanosyntax*, 277–304. Oxford: Oxford University Press.

Yip, Po-Ching & Don Rimmington. 2004. *Chinese: A comprehensive grammar*. London: Routledge.

Zyman, Erik & Nick Kalivoda. 2020. XP- and X^0-movement in the Latin verb: Evidence from mirroring and anti-mirroring. *Glossa* 5(1): 20. https://doi.org/10.5334/gjgl.1049.

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形態即句法理論初探

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提要

傳統上被認爲是形態學的現象可以用句法操作和原則來解釋，由此也可以提出傳統形態學所無法提出的問題（例如有關空語素的允准）。語言官能不包含形態學特有的成分，也不包含任何後句法形態學操作。

關鍵詞

形態學，語素變體，融合，異幹互補，遲後填音