

Feature change by Vocabulary Insertion

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Abstract

In this paper, we argue that, while feature-changing rules in Distributed Morphology are empirically justified, they should be implemented as part of Vocabulary Insertion by allowing realization rules to map feature sets not only to phonological forms but also to other feature sets. This mechanism of ‘feature-changing VIs’ is subject to the condition that it does not increase contextual markedness. We show that this alternative conception of Vocabulary Insertion not only avoids the postulation of distinct postsyntactic rules such as impoverishment and insertion, but also offers new ways of analyzing challenging phenomena such as configurational exponence, periphrasis, extended exponence, and non-natural classes of metasyncretism in Distributed Morphology.

1 Introduction

In Distributed Morphology, Vocabulary Items are typically assumed to be pairings of syntactico-semantic features and phonological forms (Embick 2015: 85), as in (1).

(1) $[F_1, F_2, F_3] \leftrightarrow /X/$

This view of Late Insertion implies a strict separation between features and forms. Vocabulary Insertion can only introduce phonological representations on the basis of features inherited from the syntactic computation. This is embodied by a principle that Embick (2000) calls *Feature Disjointness* (2).

(2) *Feature Disjointness* (Embick 2000: 188)

- a. Features that are phonological, or purely morphological, or arbitrary properties of Vocabulary Items are not present in the syntax.
- b. Syntacticosemantic features are not inserted in morphology.

In what follows, we focus on the latter claim in (2b) and suggest that this clause should be abandoned. Building on previous work (e.g. Noyer 1998, Harbour 2003, Calabrese 2011, Arregi & Nevins 2012), we will argue that feature changing rules are empirically well-motivated, if not indispensable. Where we depart from previous analysis, however, is in the implementation of feature-changing processes. We propose that Vocabulary Items may relate not only feature sets with phonological forms, but also feature sets with other feature sets. On this view, Vocabulary Insertion can effectively delete (3b), change (3c) or insert features (3d). In this way, we can also subsume additional operations that have been proposed for this purpose (e.g. impoverishment/enrichment/redundancy rules) under the general mechanism for morphological realization.

- (3) a. $[F_1, F_2, F_3] \rightarrow /X/$
 b. $[F_1, F_2, F_3] \rightarrow [F_1, F_2]$
 c. $[F_1, F_2, F_3] \rightarrow [F_1, F_2, F_4]$
 d. $[F_1, F_2, F_3] \rightarrow [F_1, F_2, F_3, F_4]$

As we will show, this move opens up several new promising avenues for analysis. First and foremost, we argue that this approach is desirable in light of the need for some kind of feature-changing rules in dealing with bidirectional syncretism. While a prominent proposal is that impoverishment rules deleting features may sometimes feed exceptional insertion of an unmarked feature (Noyer 1998), we will highlight some problems with this approach that we believe are avoided if VIs themselves can insert features in a restricted fashion. Furthermore, we will show that relaxing Feature Disjointness to allow VIs to insert, delete or replace features has a number of other welcome consequences in analyzing certain challenging phenomena such as extended exponence, configurational exponence, periphrasis and non-natural patterns of metasyncretism.

2 The necessity of feature-changing rules

As discussed by Bobaljik (2002), unrestricted feature changing rules or ‘rules of referral’ are arguably not something that we want to admit in a theory without good reason, as they significantly increase its predictive power. With this said, there are patterns of syncretism that prove challenging to analyze without feature change. One such pattern is what Baerman (2004) called *divergent bidirectional syncretism*. In bidirectional syncretism, there are (at least) two distinct instances of directional syncretism (spreading of forms) in a single paradigm. What makes a bidirectional pattern divergent, according to Baerman (2004), is that the target cell of one directional syncretism is the source of the other. A well-known example of this pattern comes from the second declension in Latin.

(4) Latin second declension (Baerman 2004: 816)

	I ‘war’	II ‘slave’	III ‘crowd’
NOM	bell-um	serv-us	vulg-us
ACC	bell-um	serv-um	vulg-us
GEN	bell-ī	serv-ī	vulg-ī
DAT	bell-ō	serv-ō	vulg-ō
ABL	bell-ō	serv-ō	vulg-ō

Here, the nominative suffix *-us* spreads to the accusative with nouns like ‘crowd’, while the accusative suffix *-um* spreads in the opposite direction to the nominative with nouns like ‘war’. There are numerous other instantiations of this pattern (see e.g. Baerman 2004, Hein & Murphy 2023b for discussion). As pointed out by Baerman (2004), the challenge in analyzing such a pattern is that the specification of forms requires a fully overlapping distribution.

For convenience, let us adopt a feature decomposition for the Latin case system in Halle (1997) where nominative is [+superior, +structural] and accusative is [–superior, +structural]. With this in place, we could start by assuming that the nominative marker *-us* is fully specified for [±superior/structural], while the accusative marker *-um* is underspecified for the shared feature of nominative and accusative (5).

- (5) a. $[+superior, +structural] \leftrightarrow -us$
 b. $[+structural] \leftrightarrow -um$

We can trigger directional spreading by deletion of the [+superior] feature in class I, evoking a retreat to the general case (6).

	I	II	III
NOM [+sup, +struc]	[+sup, +struc] ↓ +struc] ⇒ -um	-us	-us
ACC [-sup, +struc]	-um	-um	-us

The problem now is that, in order for *-us* to be eligible for insertion in accusative contexts, given the Subset Principle (Halle 1997), it cannot be specified for [\pm superior] (due to the conflicting values in NOM and ACC). For this reason, we are forced to specify *-us* as [+struc], too. Even if we were to use a different decomposition, there is no way to avoid a fully overlapping distribution here.

A solution for the problem posed by patterns of divergent bidirectional syncretism can be found in Noyer (1998), who himself was concerned with a divergent bidirectional pattern (though this work obviously pre-dates the term). The specific pattern he was analyzing was more complex, involving a systematic neutralization of number distinctions in Nimboran (also see Harbour 2003 on Kiowa).

Consider the data in (7). Here, we see that the verb stem in Nimboran takes different forms depending on the number of the subject: the ‘A stem’ in the singular, the ‘B stem’ in the dual and the ‘C stem’ in the plural. Furthermore, there is a suffix *-k* encoding the number of the subject in the dual (7b) and a different suffix *-i* (triggering palatization of a neighbouring consonant) in the plural (7c). In what Noyer (1998) calls the ‘special environment’, namely in the durative aspect, the verb now takes its B stem in the context of a singular subject (8a). Furthermore, both the C stem and the apparent plural marker *-i* are used for dual contexts, too (8b).

- | | |
|--|---|
| <p>(7) a. ηgedúo-d-u
draw.A-FUT-1
‘I will draw (here).’</p> <p>b. ηgedóu-k-d-u
draw.B-NON.SG-FUT-1
‘We (excl, dual) will draw (here).’</p> <p>c. ηgedói-<i>i</i>-d-u
draw.C-PL-FUT-1
‘We (excl, pl) will draw (here).’</p> | <p>(8) a. ηgedóu-tam-t-u
draw.B-DUR-PRES-1
‘I am drawing.’</p> <p>b. ηgedói-<i>i</i>-tam-t-u
draw.C-PL-DUR-PRES-1
‘We (excl, dual/pl) are drawing.’</p> |
|--|---|

The full paradigm of subject agreement in Nimboran is given in (9).¹

¹We have simplified the paradigm here by omitting the additional prefix *maN-* that appears in 1.INCL.SG contexts. Since inclusive singular is a context that is highly marked cross-linguistically (Harley & Ritter 2002), we assume there are additional factors involved with this prefix.

(9) *Subject agreement in Nimboran* (Inkelas 1993, Noyer 1998)

	non-durative								
	singular			dual			plural		
	I	II	III	I	II	III	I	II	III
1 EXCL	A		-u	B	-k	-u	C	-i	-u
1 INCL	A		-ám	B	-k	-ám	C	-k	ám
2	A		-e	B	-k	-e	C	-k	-e
3 MASC	A		-am	B	-k	-am	C	-i	am
3 FEM/INAN	A		-um	B	-k	-um	C	-i	am

	durative								
	singular			dual			plural		
	I	II	III	I	II	III	I	II	III
1 EXCL	B		-u	C	-i	-u	C	-i	-u
1 INCL	B		-ám	C	-i	-ám	C	-i	ám
2	B		-e	C	-i	-e	C	-i	-e
3 MASC	B		-am	C	-i	-am	C	-i	-am
3 FEM/INAN	B		-um	C	-i	-um	C	-i	-um

What is of direct interest to us here is the number morpheme in position II. As summarized in the table below, what looks like the dual marker (-k) spreads to the plural in 1st inclusive and 2nd person non-durative contexts. In the durative, the plural marker ⁻ⁱ spreads to the dual across all persons. This is summarized in (10). For convenience, we have also included the relevant feature decompositions for person and number. It is clear that we then have a case of divergent bidirectional syncretism between the dual and plural in the natural class of contexts defined by [+2].

(10) *Bidirectional syncretism in Nimboran*

		-durative		+durative	
		dual	plural	dual	plural
		[-sg, -pl]	[-sg, +pl]	[-sg, -pl]	[-sg, +pl]
1.EXCL	[+1, -2]	-k	-i	←	-i
1.INCL	[+1, +2]	-k	→	←	-i
2	[-1, +2]	-k	→	←	-i
3.M	[-1, -2, +m]	-k	-i	←	-i
3.F/IN	[-1, -2, -m]	-k	-i	←	-i

The problem of fully overlapping distributions faced by an impoverishment + underspecification analysis also applies here. Noyer (1998) pursues a different approach, however. He assumes that -k is underspecified for [±pl] and thus fits both plural and dual contexts (11a), while ⁻ⁱ realizes only the [+pl] (11b).

- (11) a. [-sg] ↔ -k
 b. [+pl] ↔ ⁻ⁱ

Both of these markers fit in the plural context (Noyer assumes that this indeterminacy is resolved by a feature hierarchy favouring insertion of the plural). In order to effect spreading of the dual to the plural in the [-durative], Noyer uses the impoverishment rule in (12) to remove the [+pl] feature

in both the 1st inclusive and the 2nd person. This will ensure that the VI in (11a) is inserted in the non-durative plural.

- (12) *Impoverishment rule I*
 $[+pl] \rightarrow \emptyset / [+2, _, -dur]$

To derive the spreading of $^{-i}$ to dual contexts in the durative, we now face a problem given the entries in (11). The VI for $^{-i}$ is specified for $[+pl]$ only, but this feature is not part of the specification of the dual, which is $[-sg, -pl]$. For this reason, it should not be possible to insert this form in the dual, given the Subset Principle. This is where feature changing rules become relevant. Noyer proposes that when a particular sub-feature is deleted, the contextually unmarked specification of that feature is inserted by what he calls a ‘persistent redundancy rule’ (Noyer 1998: 282). Concretely then, we have the impoverishment rule in (13a) that deletes $[-pl]$ in the durative dual. After this rule applies, the context for the redundancy rule in (13b) is met and it can apply to insert the unmarked value of $[\pm pl]$, which is $[+]$ in the context of $[-sg]$.²

- (13) a. *Impoverishment rule II*
 $[-pl] \rightarrow \emptyset / [_, -sg, +dur]$
 b. *Redundancy rule*
 $\emptyset \rightarrow [+pl] / [_, -sg]$

This mechanism will allow us to change the more marked dual specification ($[-sg, -pl]$) into a less marked plural one ($[-sg, +pl]$). The effects of impoverishment in both cases are summarized below in (14). In the non-durative plural, we have a simple case of impoverishment bleeding insertion of the otherwise expected form, while in the durative dual, we have deletion feeding insertion of the contextually unmarked value to effectively change a dual context into a plural one.³

(14) *Effects of impoverishment in Nimboran*

		-durative		+durative	
		dual	plural	dual	plural
		$[-sg, -pl]$	$[-sg, +pl]$	$[-sg, -pl]$	$[-sg, +pl]$
1.INCL	$[+1, +2]$	$-k$	$[-sg, +pl]$ ↓ $[-sg, \] \Rightarrow -k$	$[-sg, -pl]$ ↓ $[-sg, \]$ ↓ $[-sg, +pl] \Rightarrow ^{-i}$	$^{-i}$
2	$[-1, +2]$	$-k$	$[-sg, +pl]$ ↓ $[-sg, \] \Rightarrow -k$	$[-sg, -pl]$ ↓ $[-sg, \]$ ↓ $[-sg, +pl] \Rightarrow ^{-i}$	$^{-i}$

²Noyer (1998) uses the notation $[-sg] \rightarrow [+pl]$ for redundancy rules borrowed from phonology. As we will discuss in section 3.1, we do not believe that such rules meet the criteria for redundancy rules. Instead, we use the more transparent notation of context-sensitive insertion rules.

³One might wonder why $[+pl]$ is not re-inserted in the $[-durative]$ plural too. We come back to this in section 3.2.

This provides an elegant solution to the problem posed by divergent bidirectional syncretism and even certain patterns that had been previously treated as morphomic (see Hein & Murphy 2023*a,b* for detailed discussion). For this reason, some mechanism of feature-changing rules appears to be indispensable in light of challenging cases such as Nimboran. In what follows, we will point out some problems with Noyer’s implementation in terms of impoverishment rules feeding redundancy rules and instead argue that feature change should be effected by Vocabulary Items themselves.

3 Problems with Noyer’s implementation

3.1 Insertion rules are not redundancy rules

The first issue for Noyer’s approach to feature-changing concerns the nature of the rules that insert the unmarked value of a previously deleted feature. The term ‘redundancy rule’ is clearly a misnomer. Redundancy rules were originally introduced by Halle (1959) and served to provide predictable information on the featural make-up of a given segment. Statively interpreted, they act as constraints over possible segments; in an algorithmic interpretation, they may be understood as rules that insert predictable features in underspecified segmental representations (Stanley 1967). For instance, the fact that English nasals are always voiced could be captured by the redundancy rule in (15).

$$(15) \quad \emptyset \rightarrow [+voiced] / [___, +nasal]$$

This rule states that nasals in English are always [+voiced], or, in a more procedural conception, inserts the feature [+voiced] into the feature matrix of every nasal segment. The lexical representation of nasals can therefore remain underspecified for the value of [\pm voiced]. As there exist no voiceless nasals in the English grammar, including [+voiced] in lexical representations of nasal segments is redundant because it can be reliably predicted from the presence of [+nasal].

The information that the ‘redundancy rules’ provide in Noyer’s approach, however, is not actually redundant in any way. To see this, consider his analysis of Nimboran again. Noyer suggests that the feature change from dual to plural in durative contexts (spreading the plural marker ⁻ⁱ to dual environments) is effected by impoverishment of the [-pl] feature (16a) followed by insertion of [+pl] via a redundancy rule (16b).

$$(16) \quad \begin{array}{l} \text{a. } [-pl] \rightarrow \emptyset / [-sg, +dur] \\ \text{b. } \emptyset \rightarrow [+pl] / [-sg] \end{array}$$

In contrast to the case of English nasals, where the feature [+nasal] implies the feature [+voiced], i.e. voiceless nasals do not exist, the feature [-sg] in Nimboran does not unambiguously imply the feature [+pl]. This is precisely because the language has a grammatical dual whose feature composition is [-pl, -sg]. The value of the feature [\pm pl] in a [-sg] context is therefore far from being redundant or predictable, but quite the contrary. It is decisive for distinguishing dual from plural.

The central point here is that decomposing a feature-changing rule into deletion plus insertion is not any less stipulative than feature-changing rule itself. While redundancy rules are independently required, these are different from the kind of insertion rules that Noyer adopts. Embick & Noyer (2007: 313) more aptly refer to these as ‘markedness rules’, which further highlights the fact that these rules have to ‘know’ which feature value is the unmarked one in a given context.

3.2 Disjunctive blocking

A similar argument that markedness decreasing nature of feature-changing processes must be stipulated comes from Noyer’s assumption of disjunctive blocking. Recall that Noyer posited the im-

poverishment rule in (17a) that deletes the unmarked [+pl] value in the context of [-sg]. This is the rule that is responsible for the spreading of the dual marker *-k* into the plural in non-durative 1st person inclusive and 2nd person contexts. Recall, however, that Noyer also assumes that there is the redundancy rule in (17b) that inserts [+pl] in the context of [-sg]. The problem here is that we do not want the rule in (17b) to apply after (17a), which would result in re-insertion of the previously deleted [+pl] value. Instead, (17b) may only apply after [-pl] has been deleted.

- (17) a. [+pl] → ∅ / [+2, -sg, -dur]
 b. ∅ → [+pl] / [-sg]

To address this issue, Noyer (1998: 276, fn. 6) suggests that the rule (17a) that impoverishes the unmarked value and the rule (17b) (repeated from (16b)) that inserts the unmarked value are in a disjunctive blocking relation precisely because one inserts the value that the other deletes. Under this view, the impoverishment rule takes precedence over the insertion rule on account of being more specific, i.e. having a narrower domain of application. This proclaimed disjunctivity, however, does not actually follow from any properties of the rules themselves. Natural disjunctive blocking between two rules commonly arises when the structural description of each of them is met by the input. In that case, there is a competition for application that can be resolved by appealing to specificity. Commonly, the structural change effected by the more specific rule modifies the input such that the structural description of the other rule is no longer met. In other words, the more specific rule bleeds application of the less specific one.

With the two rules in (17), however, this is not the case. The natural relation between them is one of mutual feeding, i.e. a Duke-of-York situation, where each rule creates the input for the respective other rule (Pullum 1976). Without anything else being said, nothing should prevent the redundancy rule in (17b) to apply to the output of the impoverishment rule (17a) because the output of (17a) still meets the structural description of (17b). In order to achieve disjunctive blocking, the rules would have to be extrinsically ordered such that impoverishment of the unmarked value [+pl] and insertion of the unmarked value [+pl] are in the same rule block whereas impoverishment of the marked value [-pl] must be part of an earlier rule block (18).

- (18) Block I [-pl] → ∅ / ____ [-sg] (rule deleting marked value)
 ∅ → [+pl] / ____ [-sg] (persistent redundancy rule)
- Block II [+pl] → ∅ / ____ [-sg] (rule deleting unmarked value)
 ∅ → [+pl] / ____ [-sg] (persistent redundancy rule)

This same logic will apply to all instances of feature-changing. The necessity of extrinsic ordering of this kind not only undermines the purported persistency of the insertion rules, but also requires that the rules ‘know’ whether they are targeting a (un)marked feature.

3.3 Unwanted insertion

The final issue for Noyer’s approach to feature-changing is the potential unwanted overapplication of insertion rules. Since insertion in Noyer’s system is a side effect of impoverishment, we may end up with cases in which impoverishment that is motivated for reasons other than being part of a composite feature-changing process ends up feeding a persistent insertion rule. A promising place to look for such cases is *metasyncretism*, that is, identical patterns of syncretism that re-occur across paradigms (with different exponents). A standard view in the DM literature is that metasyncretism is derived by impoverishment. The leading idea is that a metasyncretic distribution should not be treated as an accident of the feature specifications of individual VIs, but instead be enforced by the lack of other

features to express a distinction between the metasyncretic contexts in the paradigm (Bobaljik 2002, Harley 2008). A simple way to ensure this with impoverishment is to delete all features but those expressed by the metasyncretic VI. This is summarized by the *Metasyncretism Principle* in (19).

- (19) *Metasyncretism Principle* (Bobaljik 2002, Harley 2008)
 If the distribution of a marker α is metasyncretic, then the features of the cells occupied by α must fully match the features that α realizes.

With this in mind, consider the various paradigms of verbal inflection in Nubian given in (20). Here, we see clear patterns of metasyncretism. For example, the suffixes *-r* and *-s*, which mark present and past tense respectively, show the same distribution in their respective paradigms, i.e. across 1st singular and 1st and 2nd plural contexts. The same is true for *-min* in the affirmative paradigm. This syncretism intersects with a regular syncretism between 2nd and 3rd person in the singular, that extends to the 3rd plural for some forms. This is exhibited by *i*, *ò* and *mi*, for example.⁴

- (20) *Nubian interrogative inflection for éd ‘take’* (Harley 2008: 286–287)

Interrogative I (Yes/No)						
		Present		Past		
		Singular	Plural	Singular	Plural	
1	éd- r -è	éd- r -ò		éd- s -è	éd- s -ò	
2	éd- i			éd-ò		
3		éd- innà			éd- sà	

Interrogative IIa (Wh)						
		Present		Past		
		Singular	Plural	Singular	Plural	
1	éd- r -é-è	éd- r -ó-ò		éd- s -é-è	éd- s -ó-ò	
2	éd- náà			éd-ò- náà		
3		éd- innà -náà			éd- sà -náà	

Interrogative IIb (Affirmative)			
		Singular	Plural
1	éd- min -é-è	éd- min -ó-ò	
2	éd- mi		
3		éd- mì -náà	

We will not concern ourselves with a full analysis of this paradigm (see Harley 2008 for a detailed discussion). Instead, we will focus on the abstract pattern of metasyncretism summarized abstractly in (21). We find a particular ‘L-shaped’ metasyncretic distribution of multiple forms, e.g. A and C, interlocked with another metasyncretic distribution of B/D (which also extends to 3PL in some cases).

⁴Harley (2008) argues that *i* is actually epenthetic so the relevant marker is actually a zero that is also present in the present singular of the Interrogative IIa paradigm. The form would therefore actually be *éd-Ø-náà* in Interrogative I and *éd-Ø-Ø* (with *i*-epenthesis) in Interrogative IIb. The forms exhibiting the metasyncretism discussed here are all assumed by Harley (2008) to be exponents of T/Agr, so are all in competition for insertion in the same context.

(21)

		context 1		context 2	
		sg	pl	sg	pl
1st	+auth, +part	A	A	C	C
2nd	-auth, +part	B	A	D	C
3rd	-auth, -part	B		D	

To derive this pattern in accordance with the Metasyncretism Principle, we need there to be no featural distinction between the cells realized by A/C or B/D. We will assume that the distribution of the A and C forms is the second person specification [-auth, +part], while the B/D forms realize the 3rd person values [-auth(or), -part(icipant)].⁵

- (22) a. [-auth, +part] ↔ A/C
 b. [-auth, -part] ↔ B/D

In order to derive the desired distributions, we now need to enforce spreading of the underlying 3rd person B form to the 2nd person. Using Noyer's system, one can easily do this by deleting the [+part] in the 2nd person singular (23a). On Noyer's approach, this deletion will trigger the persistent redundancy/markedness rule in (23b) that inserts the unmarked value of [±part] in the context of [-auth], namely [-part]. Consequently, the B marker in (21b) is inserted, as shown in (25). We can then do the same thing for the A marker, turning both 1st singular and plural contexts into 2nd person specifications by first deleting the [+auth] value (24a) and then inserting the contextually unmarked [-auth] value (23b).

(23) Rules for B marker

- a. [+part] → ∅ / ____ [-auth, sg]
 b. ∅ → [-part] / ____ [-auth]

(24) Rules for A marker

- a. [+auth] → ∅ / ____ [+part]
 b. ∅ → [-auth] / ____ [+part]

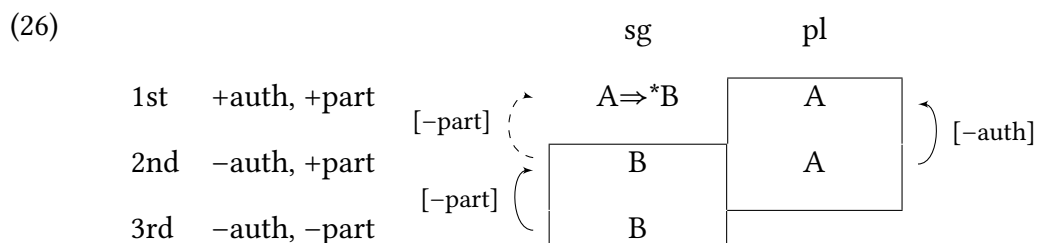
The effects of these impoverishment/insertion operations is illustrated for each context in (25).

(25)

		sg	pl
1st	+auth, +part	[+auth, +part] ↓ [, +part] ↓ [-auth, +part] ⇒ A	[+auth, +part] ↓ [, +part] ↓ [-auth, +part] ⇒ A
2nd	-auth, +part	[-auth, +part] ↓ [-auth,] ↓ [-auth, -part] ⇒ B	A
3rd	-auth, -part	B	

⁵This means that the lower right corner cell is underlying also filled by B. It can, however, be blocked by a more specific exponent realizing a [pl] feature in addition to [-auth, -part]. This is presumably what is happening with *-innà* and *sà*, for example.

As we can see, this derives the distribution of A and B in a way that renders the metasyncretism non-accidental. There is a problem, however. In turning, the 1sg context into a 2nd person one by means of the rules in (24), we now have the conditions for the deletion/insertion rules in (23) to apply. Recall that these rules have the effect of turning a 2sg context into 3sg context (required for the distribution of B). For this reason, when we turn 1sg into 2sg as part of deriving the metasyncretic distribution of A, we actually create the environment for the B rules to apply. We would therefore also change [+part] into [-part] in the 1sg (26), thereby triggering further spreading of B.



This issue, which we might call the *chain shift problem*, stems from the fact that the domain for feature changing rules for B accidentally overlap with those affected by the deletion needed to derive the metasyncretic distribution of A. There are potential ways around this, e.g. by means of extrinsic ordering, but such a move has no independent motivation (see section 3.2). If we instead do not decompose feature-changing rules into insertion and deletion, however, then this problem does not arise.

4 Feature-changing VIs

In light of all of this, we argue that feature-changing rules are necessary, but should not be understood as a process of deletion that results in subsequent insertion. Instead, feature change should be the result of a single rule. We pursue the overarching goal, also present in Trommer (1999, 2001), of reinterpreting postsyntactic operations such as impoverishment as part of the mechanism for morphological realization itself. Operations that manipulate feature sets prior to insertion, such as impoverishment, insertion and feature-changing rules, can be accommodated in the same format as traditional Vocabulary Items if we allow feature sets to be ‘realized’ as feature sets (in contravention of *Feature Disjointness*). This is shown abstractly in (27). The feature set $[F_1, F_2, F_3]$ can be realized by some phonological string $/X/$ (27a), or alternatively by another feature set $[F_4, F_5, F_6]$ (27b), where some of the features may be identical. For the sake of clarity, we will not use the familiar bidirectional arrow for VIs, as the feature change in a VI such as (27b) is only intended to apply in one direction.

- (27)
- a. $[F_1, F_2, F_3] \rightarrow /X/$
 - b. $[F_1, F_2, F_3] \rightarrow [F_4, F_5, F_6]$

With this alternative understanding of Vocabulary Insertion in place, let us revisit Noyer’s (1998) analysis of Nimboran. Recall that Noyer proposed an impoverishment rule in the durative that deletes $[-pl]$ in dual (28a). Subsequently, a ‘redundancy’ or markedness rule inserts the contextually unmarked value $[+pl]$, turning this into a plural context (28b).

- (28)
- a. *Impoverishment rule*
 $[-pl] \rightarrow \emptyset / [_ , -sg, +dur]$
 - b. *Redundancy rule*
 $\emptyset \rightarrow [+pl] / [_ , -sg]$

On our view of VIs, there is no need for two distinct rules, as their joint effect can instead be derived by the feature-changing VI in (29).

- (29) *Feature-changing VI*
 $[-pl, -sg, +dur] \rightarrow [+pl, -sg, +dur]$

This VI will result in a change from $[-pl]$ to $[+pl]$, similar to the conspiracy of the rules in (28). Notice here that the context specification for the rules is now included as part of the insertion context. As we discuss in section 5.4, this has some potentially interesting consequences for how these rules compete with regular VIs that introduce phonological forms.

An important part of Noyer’s system is that insertion may only introduce contextually unmarked values. As we have discussed, this must ultimately be stipulated in Noyer’s system and we will do the same for feature-changing VIs. The way we propose to do this is by means of the constraint in (30).

- (30) *Markedness restriction on VIs*
 Let F and G be feature sets. For any VI of the form $F \rightarrow G$, no subset of G’s features may be a more marked combination than the corresponding subset of F’s features.

This constraint will rule out VIs that turn a less marked feature combination into a more marked one. The easiest way to understand this is as follows: Let us assume that there are independently motivated hierarchies for grammatical categories such as number, where dual is more marked than plural, and plural is in turn more marked than singular (31) (see e.g. Harbour 2011*a,b*). For any such markedness hierarchy, the decomposed features that make up each step on the hierarchy will have a particular status vis-à-vis markedness. For example, the only feature that distinguishes dual and plural is $[\pm pl]$. Consequently, $[-pl]$ is the marked specification of $[\pm pl]$ in the context of $[-sg]$.

- (31) *Markedness hierarchy for number*
- | | | | | |
|--------------|---|--------------|---|--------------|
| dual | > | plural | > | singular |
| $[-sg, -pl]$ | | $[-sg, +pl]$ | | $[+sg, -pl]$ |

The feature-changing VI in (29) contains $[-sg, -pl]$ corresponding to the dual as its lefthand feature set F. The feature set G that it is realized as contains the feature set $[-sg, +pl]$ (the specification for plural). Since this is an overall reduction in markedness, this VI conforms to (30).⁶ A comparable VI that turned a plural into a dual, however, would not be possible.

In this way, we can maintain the insight of Noyer’s approach, while avoiding the need to treat feature changing as a conspiracy of deletion and insertion and certain problems associated with this (e.g. extrinsic ordering; see Keine 2013: 220). In the remainder of the paper, we will discuss what we see as some further welcome consequences of adopting feature-changing VIs.

5 Some consequences of feature-changing VIs

5.1 Deletion and insertion

One immediate consequence of recasting feature-changing rules as VIs that rewrite morphosyntactic features with other morphosyntactic features concerns feature deletion and insertion processes. For deletion, our proposal allows us to abandon impoverishment as a distinct rule type in the postsyntactic component (see Trommer 1999 for a similar proposal, treating impoverishment as highly specific VIs

⁶In addition, an ‘impoverishment VI’ that would simply remove the feature $[-pl]$ would also count as markedness-decreasing if we assume three levels of contextual markedness: marked > unmarked > underspecified (see Hein & Murphy 2023*a*).

with zero phonological content). This can be achieved by a VI that changes the feature set *S* containing the target feature *F* of deletion into an identical feature set *S'* that minimally differs from *S* in the absence of *F*. Take as an example again the by now familiar impoverishment rule for Nimboran in (32) that achieves the spread of the dual marker *-k* into the plural in non-durative 1st inclusive and 2nd person environments.

- (32) *Impoverishment rule*
 [+pl] → ∅ / [+2, -sg, -dur]

This rule can be reformulated as a feature-changing VI by specifying the left side of the VI for the union of the target of [+pl] and the context features [+2, -sg, -dur] of the original rule, and omitting [+pl] on the right side of the VI.

- (33) *Impoverishment VI*
 [+2, +pl, -sg, -dur] → [+2, -sg, -dur]

Any such deletion VI will necessarily adhere to the markedness restriction on feature-changing VIs (30), as deletion of features will never increase markedness. What is more, since impoverishment in this approach is treated on a par with regular vocabulary insertion, it is expected that it competes with other VIs according to the Subset Principle and specificity. That this is actually a welcome result will be argued for in section 5.4 below. Finally, recall from the discussion in section 3.2 that Noyer was forced to appeal to disjunctive blocking to prevent the contextually unmarked value deleted by the rule in (32) being reinserted by a persistent insertion rule. Since we treat feature changing processes as the direct rewriting of features (rather than insertion fed by deletion), no comparable problem arises on our approach.

We now turn to the complementary rule type to impoverishment, namely enrichment. Müller (2007) introduces enrichment rules to account for cases of multiple or extended exponence in which an underlying morphosyntactic feature is realized by two distinct overt markers on the surface (Matthews 1972, 1974, Caballero & Harris 2012). One example that he discusses is case and number marking on nouns in the Daghestanian language Archi (as described in Kibrik 1991, 2003, Mel'čuk 1999).

- | | | | | | | |
|------|----|-----------------------------|----|------------------------------|----|----------------------------------|
| (34) | a. | gel-li
cup-ERG.SG | c. | dab-li
awl-ERG.SG | e. | qłinn-i
bridge-ERG.SG |
| | b. | gel-um-čaj
cup-PL-ERG.PL | d. | dab-mul-čaj
awl-PL-ERG.PL | f. | qłonn-or-čaj
bridge-PL-ERG.PL |

As we can see, plural is consistently marked by *-um*, *-mul*, or *-or*, depending on the actual noun. In the ergative, an additional marker *-čaj* appears. Müller (2007) assumes that this formative encodes both ergative case and plural number. Under this analysis, in a form such as *dab-mul-čaj* plural is multiply exponed, once by the pure plural marker *-mul* and a second time by the fused case-number marker *-čaj*. In order to account for this, Müller assumes an enrichment rule that inserts an additional plural feature in the context of ergative case (35).

- (35) *Enrichment rule for Archi* (Müller 2007: 262)
 ∅ → [+pl] / [erg, +pl]

Another case of multiple exponence put forward by Müller (2007) is dative plural marking in German (Eisenberg 2000, Wiese 2000). In the dative case, some German nouns may be marked by their regular plural marker, e.g. *-e* or *-er*, that also appears in other cases (36b, e), and additionally take a dedicated dative plural suffix *-n* (36a, c), that neither appears in other cases in the plural (36b, e) nor in the dative singular (36c, f).

- | | | | | | | |
|------|----|----------------|-----------------|----|----------------|-----------------|
| (36) | a. | den | Kind-er-n | d. | den | Tisch-e-n |
| | | the.DAT.PL | child-PL-DAT.PL | | the.DAT.PL | table-PL-DAT.PL |
| | b. | die | Kind-er | e. | die | Tisch-e |
| | | the.NOM/ACC.PL | child-PL | | the.NOM/ACC.PL | table-PL |
| | c. | dem | Kind | f. | dem | Tisch |
| | | the.DAT.SG | child.DAT.SG | | the.DAT.SG | table.DAT.SG |

For the German case, enrichment takes the form in (37), doubling the [+pl] feature that is already present in the feature bundle.

- (37) *Enrichment rule for German* (Müller 2007: 262)
 $\emptyset \rightarrow [+pl] / [\text{dat}, +pl]$

In such cases of multiple exponence, Müller suggests enrichment rules apply prior to Vocabulary Insertion. These rules may insert additional features into a feature bundle. Crucially, in order to prevent overgeneration, Müller has to restrict enrichment to insertion of features that are already present in the feature bundle thereby effectively constraining it to doubling of features. The resulting feature bundle then contains two instances of the feature [+pl], i.e. it is [dat, +pl, +pl]. This enriched feature bundle is subsequently targeted by Vocabulary Insertion with the items in (38). One of the plural features is realized by the general plural marker *-er* (or *-e* in the case of *Tisch* ‘table’) while the other is exponed together with the dative case feature as the fusional marker *-n*, thereby giving rise to the multiple exponence pattern that we observed.

- (38)
- | | | | |
|----|------------|---|------------|
| a. | [dat, +pl] | → | <i>-n</i> |
| b. | [+pl] | → | <i>-er</i> |

Enrichment is a necessary assumption if Vocabulary Insertion is assumed to ‘consume resources’ (Trommer 1999). In other words, if Vocabulary Insertion involves rewriting of features with forms (Bobaljik 2000), then multiple exponence requires that there be more than one occurrence of the multiply exponed feature. Feature-changing VIs allow us to straightforwardly implement enrichment rules by mentioning additional features on the right side of the VI. Taking the rule for German in (37), the corresponding VI in our approach would rewrite a feature bundle consisting of a dative and a plural feature into one that consists of a dative feature and two plural features as in (39).

- (39) *Enrichment VI*
 $[\text{dat}, +pl] \rightarrow [\text{dat}, +pl, +pl]$

While Müller had to stipulate that enrichment rules are restricted to the insertion of features already present in the feature bundle, in the current proposal this restriction falls out naturally from the markedness restriction on feature-changing VIs. Multiple occurrences of some feature will not change the overall contextual markedness of a given feature combination.

5.2 Configurational exponence

Allowing Vocabulary Items to introduce features opens up an interesting avenue for the analysis of what one can call ‘configurational exponence’. In cases of configurational exponence, an inflectional category is expressed not (only) by morphological means (e.g. affixation, tonal marking, etc.) but (also) by a change in word order. An example of this comes from the Zaparoan language Iquito. In this language, irrealis mood is marked by the occurrence of a single constituent between the subject and the verb (40b) while in realis mood, the subject and the verb have to be adjacent and the sentence thus appears in the canonical SVO word order (40a) (Lai 2009, Hansen 2011, Beier et al. 2011).

- (40) a. Iima kapi-ki-Ø [NP asúraaja]
 Ema cook-PFV-NPST manioc
 ‘Ema cooked manioc.’
 b. Iima [NP asúraaja] kapi-ki-Ø
 Ema manioc cook-PFV-NPST
 ‘Ema will cook manioc.’ (Beier et al. 2011: 66)

The intervening constituent does not have to be nominal. Placement of an adverb (41), a prepositional phrase (42), or a negative particle (43) between the subject and the object likewise leads to an irrealis interpretation of the sentence.

- (41) a. Kí= maki-ki-Ø [AdvP suwaáta]
 1SG= sleep-PFV-NPST well
 ‘I slept well.’
 b. Kí= [AdvP suwaáta] maki-ki-Ø.
 1SG= well sleep-PFV-NPST
 ‘I will sleep well.’ (Beier et al. 2011: 82)

- (42) Kí-níyaaka [PP Iquito=jina] iiku-maa-Ø
 1SG-husband Iquitos=LOC go-REMPFV-NPST
 ‘My husband will go to Iquitos (in the distant future).’ (Beier et al. 2011: 81)

- (43) a. Saakaa iina kasíra-ji-ki-Ø [XP kaa] ikwani ?
 what DET catch-NEG-PFV-NPST NEG man
 ‘What didn’t this man catch?’
 b. Jáana simiimi kí= [XP kaa] paa-ji-rii-Ø ?
 which book 1SG= NEG study-NEG-MMTPFV-NPST
 ‘Which book won’t I read?’ (Hansen 2011: 146, 149)

Murphy & Wilson (to appear) view this ‘irrealis position’ as an inner specifier of T that is derived by a category-neutral [EPP] that is present only on heads with a [–realis] specification. Limiting this [EPP] feature to irrealis T essentially amounts to a feature co-occurrence restriction in the lexicon.

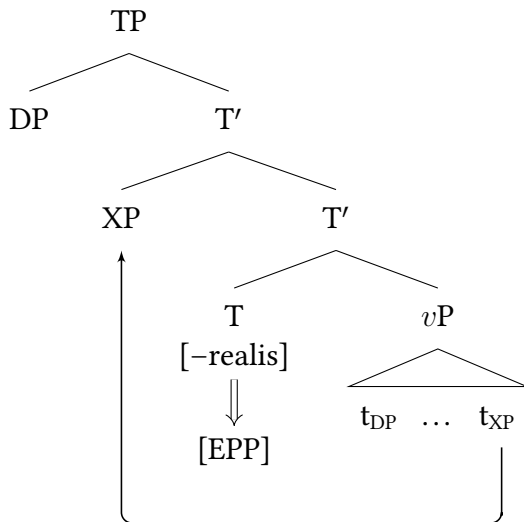
The current proposal affords us to derive configurational exponence of this kind. We can implement the intuition that SXV order is a part of the morphological expression of irrealis mood if we allow VIs to not only introduce morphosyntactic features, but also movement-related syntactic features such as the additional [EPP] feature employed in Murphy & Wilson’s (to appear) analysis. All else being equal, the VI for the realization of irrealis on T in Iquito would replace the feature [–realis] with the relevant syntactic feature (44).⁷

- (44) [–realis] → [EPP]

On this view, the Iquito irrealis examples would have the following structure:

⁷In addition, Murphy & Wilson (to appear) note that irrealis marking involves a specific tonal melody. The exponent in (44) could therefore also introduce the relevant phonological material that leads to the tonal change.

(45)



This analysis entails that syntactic features such as [EPP] are also still relevant at PF. One possible way of understanding this would be that movement may take place on the PF branch directly (see e.g. Sauerland & Elbourne 2002, Agbayani & Golston 2010, 2016). Alternatively, one could assume that the checking of syntactic features may be delayed until PF. Thus, if a syntactic feature such as the [EPP] were introduced at PF in (45), then this could only be checked in a structure that contained movement of an XP to create an additional specifier of T. The final option would be to allow for some degree of interleaving between syntax and post-syntax such that, once a given domain has been subjected to post-syntactic Vocabulary Insertion, it is fed back into syntax proper (see Calabrese & Pescarini 2014, Martinović 2019).

Similar cases of configurational exponence of an arguably inflectional category can be found in other languages. In Bangla (Indo-Aryan), for example, there is variable order inside the DP between the adjective and noun on one side and the numeral and classifier on the other (Bhattacharya 1999*a,b*). As argued by Dayal (2012), definiteness is expressed by the position of the noun phrase relative to the classifier and numeral (46). If the NP follows the classifier, the base order, the DP receives an indefinite interpretation (46a). If it precedes the classifier, the DP is definite (46b).

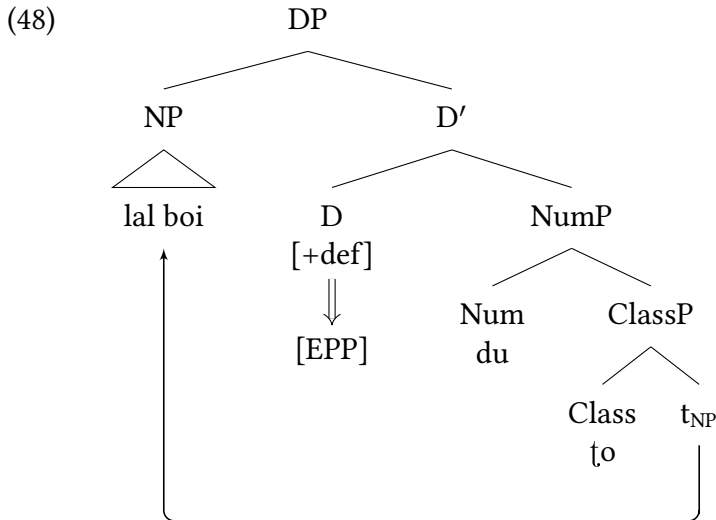
- (46) a. du ʈo lal boi
 two CL red book
 ‘two red books’
 b. lal boi du ʈo
 red book two CL
 ‘the two red books’

(Dayal 2012: 204f.)

Bhattacharya (1999*b*) analyzes this word order change as involving NP movement into the specifier of a higher head, which we will assume here to be D. Furthermore, we can assume that definiteness is encoded by a [\pm def(inite)] feature on D. In order to make sure that there is only movement of NP in definite noun phrases, we would need the VIs in (47). The feature [+def] would be ‘exponed’ as the [EPP] feature (47a), while [-def] receives a null realization.

- (47) a. [+def] → [EPP]
 b. [-def] → \emptyset

In the derivation of (46b), the NP will have to move to the specifier of D, as a consequence of the rule in (47a).



As pointed out by Beier et al. (2011), other examples of configurational exponence come from the West African languages Leggbó (Niger-Congo, Nigeria) and Kwaa (Niger-Congo, Liberia). In these languages, positive polarity sentences show SVO order (49a), (50a). Negative polarity sentences, however, exhibit SOV order (49b), (50b).

(49) *Polarity in Leggbó* (Good 2003: 111f.)

- a. Wàdum sé e-dzi lídzil.
man the 3SG-eat food
'The man ate food.'
- b. Wàdum sé lídzil eè-dzi.
man the food 3SG.NEG-eat
'The man didn't eat food.'

(50) *Polarity in Kwaa* (Welmers 1973: 412)

- a. Mà túbá wò.
1SG hit 3SG
'I hit him.'
- b. Mà wó túbá.
1SG 3SG hit
'I didn't hit him.'

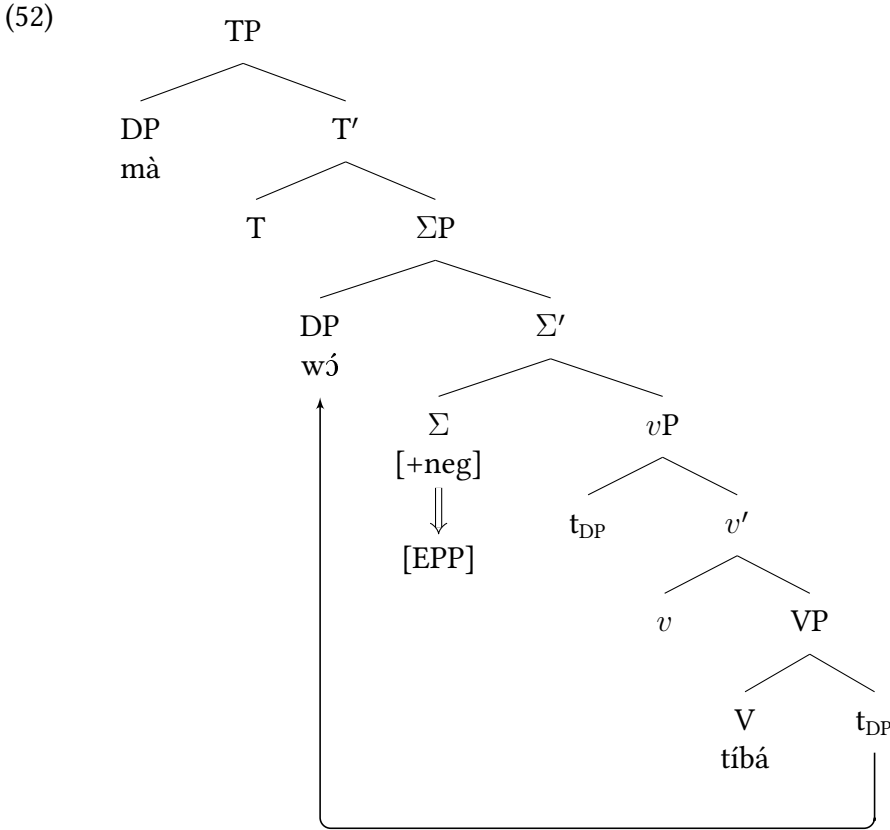
In both cases, negation—a category that is commonly expressed by its own formative either as a free-standing morpheme or as an affix/clitic—is expressed by a change in word order. In addition, like in Iquito above, there also is a tone change involved. In Leggbó the mid-tone on the subject agreement affix changes from mid to low and the vowel is lengthened. In Kwaa, it is the tone on the object pronoun that undergoes a change from low to high.⁸

We can capture these word order alternations as direct exponents of polarity in a similar fashion as the irrealis pattern in Iquito again. Taking polarity to be encoded on a Σ -head just below TP (Laka 1990), this can be achieved by the feature-changing VI in (51a) that realizes negation as a movement-triggering feature whereas positive polarity is marked by a zero exponent (51b).

⁸It is not clear to us whether there is any example of purely configurational exponence (except perhaps the Bangla case). Frequently, there is a tonal or segmental alternation in addition to some change in word order. For the Kwaa example, the VI would insert both the [EPP] and a floating high tone that would dock onto the moved object.

- (51) a. [+neg] → [EPP]
 b. [-neg] → ∅

When inserted into Σ , (51a) will lead to movement of the object DP across the verb, as shown for the Kwaa sentence (50b) in (52).



At this point, one might wonder how insertion of syntactic features conforms to the markedness restriction on feature-changing VIs that we proposed in (30). Since formal syntactic features such as the [EPP] do not form part of larger grammatical categories (such as person or number), their insertion can neither reduce nor increase contextual markedness of a given feature set.

5.3 Periphrasis

A related phenomenon in which it seems that morphological distinctions are realized syntactically is the periphrastic expression of certain feature combinations in a paradigm. It has been argued, e.g. by Sadler & Spencer (2001) working in an LFG framework, that the syntactic presence of an auxiliary in the Latin perfect passive in Latin is part of the morphological realization of these morphosyntactic features (also see Börjars et al. 1997, Ackerman & Stump 2004). If Vocabulary Items can introduce syntactic features, then we can capture the same insight in a DM approach.

Instead of the much-discussed Latin example, we will illustrate how periphrasis can be viewed as an element of morphological exponence on the basis of Sanskrit periphrastic future tense, as presented in Stump (2013) (also see Stump 2001: 231–235). First, consider the components involved in this construction. The first is an inflected form of the verb *as* ('be'). Its present indicative active forms are given in (53).

(53) Present indicative active forms of Sanskrit 'be' (Stump 2013: 111)

	singular	dual	plural
1	ásmi	svás	smás
2	ási	sthás	sthá
3	ásti	stás	sánti

Second, the lexical verb in the future tense surfaces in a form identical to the masculine agent noun derivative of that verb. These forms show distinctions for case, number and gender. A subset of the masculine forms are given in (54). In the periphrastic future, it is the masculine nominative singular form (e.g. *dātá* for 'give') that is used.

(54) Masculine agent noun derivatives of *dā* 'give' (Stump 2013: 110)

	singular	dual	plural
NOM	dātá	dātárau	dātáras
VOC	dātár	dātárau	dātáras
ACC	dātáram	dātárau	dātṛṇ

As Stump (2013) shows, these two elements combine in certain cells of the future tense paradigm. The verb *dā* 'give' takes a periphrastic form built off the finite auxiliary in (53) and the nominative singular form of the agent nominalization of the verb in (54) in 1st and 2nd person. In 3rd person, we do not find the expected auxiliary but instead the nominative agent noun form inflected for the relevant number value. The full paradigm from Stump (2013: 111) is shown in (55). The forms given in (55) are those prior to processes of automatic sandhi which cause the forms to be pronounced (and written) together, e.g. 1st singular ultimately has the form *dātásmi*, however these forms clearly contain the auxiliary in the 1st and 2nd persons.

(55) Sanskrit periphrastic future tense forms for *dā* 'give' (without sandhi)

	singular	dual	plural
1	dātá asmi	dātá svas	dātá smas
2	dātá asi	dātá sthas	dātá stha
3	dātá (*dātá ásti)	dātárau (*dātá stás)	dātáras (*dātá sánti)

The theoretical challenge here is how to block periphrasis in 3rd person future contexts. In a standard DM approach, one would have to tie the presence/absence of head movement or Lowering to a particular set of features on T (cf. Embick 2000).

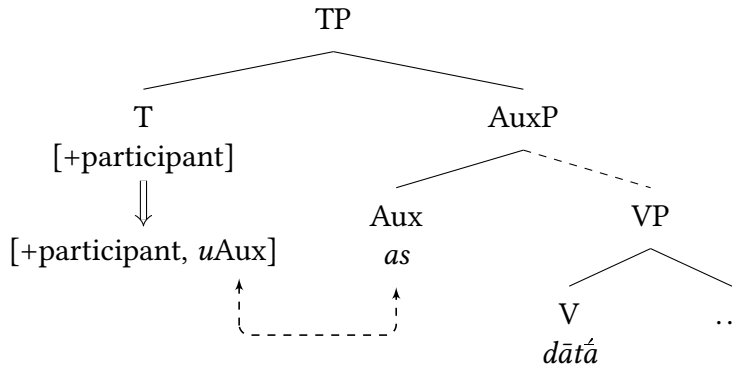
Given the possibility of VIs that introduce syntactic features, an alternative approach becomes possible. This is one in which the requirement for an auxiliary is part of the exponence of the relevant features. If we adopt a VI such as (56), we can assume that a selectional feature [*uAux*] is introduced in the context of a [+participant] feature on T.

(56) [+participant] → [+participant, *uAux*]

The effect that such a feature will have will depend on our precise architectural assumptions. There are a few possibilities. First, if one were to assume some degree interleaving of syntax and post-syntax (as discussed in the preceding section), then this feature could be inserted in syntax proper, where it can

trigger subsequent merger of an auxiliary (e.g. in the specifier of TP as in Arregi & Pietraszko 2024). Alternatively, we could assume that the [*uAux*] feature is inserted at PF, but still must be checked at this interface due to its uninterpretability. Doing so would require that an auxiliary already be present in the structure. A derivation which does not contain the auxiliary will therefore crash. A sketch of this kind of analysis is given in (57).

(57)



In this way, we can directly capture why 3rd person contexts do not have periphrasis. Assuming that auxiliaries must be licensed by a relevant feature, they will not be present in 3rd person contexts, which will not contain a feature like [*uAux*] enforcing this requirement.

5.4 VIs competing with impoverishment

The final consequence we will discuss here involves the potential competition between what we might call ‘rules of exponence’ (the rules that insert morphemes) and ‘rules of referral’ (the rules that derive syncretism). Given what we have proposed here, there is no real distinction between the two – both kinds of rules involve the standard format for Vocabulary Items. This means that we now expect VIs to compete with ‘impoverishment rules’ directly.

This precise conclusion was actually argued for by Stump (1993) in the early work on Paradigm Function Morphology (also see Stump 2001). He discussed cases in which it seems that a rule of referral appears to be blocked by a more specific rule of exponence. One such example of this comes from the the case declension of nouns in Sanskrit, where we see that, across various declension classes, the ablative and genitive are syncretic in the singular. We have listed three such classes in (58) (Stump 1993 provides an additional three). This holds in all but one inflection class, namely the ‘*a*-stem’. Here, we find distinct forms for the genitive and ablative singular.

(58) *Case declension of Sanskrit nouns* (Stump 1993: 455)

<i>a</i> -stem: <i>aśva</i> - ‘horse’				masculine <i>i</i> -stem: <i>agni</i> - ‘fire’			
	singular	dual	plural		singular	dual	plural
DAT	<i>aśvāya</i>	<i>aśvābhyām</i>	<i>aśvebhyas</i>	DAT	<i>agnaye</i>	<i>agnibhyām</i>	<i>agnibhyas</i>
ABL	<i>aśvāt</i>			ABL	<i>agnes</i>		
GEN	<i>aśvasya</i>	<i>aśvayos</i>	<i>aśvñām</i>	GEN		<i>agnyos</i>	<i>agnīnām</i>
<i>ā</i> -stem: <i>senā</i> ‘army’				<i>an</i> -stem: <i>rājan</i> - ‘king’			
	singular	dual	plural		singular	dual	plural
DAT	<i>senyāi</i>	<i>senābhyām</i>	<i>senābhyas</i>	DAT	<i>rājñe</i>	<i>rājabhyām</i>	<i>rājabhyas</i>
ABL	<i>senyās</i>			ABL	<i>rājñas</i>		
GEN		<i>senayos</i>	<i>senānām</i>	GEN		<i>rājñas</i>	<i>rājños</i>

Stump (1993) argues that this pattern should be analyzed as the *a*-stem ablative forms being more specific, so as to override the rule of referral that would otherwise borrow the form of the genitive. We can express a similar intuition with the present view of Vocabulary Insertion. First, let us assume that dative is [+object] and [+governed] in addition to being [–locative], (59a), though bear in mind that the precise label we give to these decomposed features is not crucial. For genitive and ablative, both are [–object] but differ with regard to the specification of [±governed] and [±locative] (59b–c).

- (59) a. DAT: [+object, +governed, –locative]
 b. GEN: [–object, +governed, –locative]
 c. ABL: [–object, –governed, +locative]

We can then adopt a VI effecting impoverishment of the conflicting [±locative] and [±governed] values in the ablative and genitive (60c).⁹ This rule applies in principle to all inflection classes, however it is blocked in the ‘*a*-stem’ class, which we represent here with the feature [β], by the more specific exponents in (60a) and (60b). Instead of being exponed as an impoverished feature set, the features of the *a*-stem are realized by a suffix.

- (60) a. [–obj, +gov, +loc, +sg, β] → *-āt*
 b. [–obj, –loc, –gov, +sg, β] → *-sya*
 c. [–obj, ±loc, ±gov, +sg] → [–obj, +sg]
 d. [–obj, +sg] → *-as*

In all other contexts, the impoverishment VI in (60c) will necessarily be more specific than the VI realizing the syncretic ablative/genitive suffix (60b).¹⁰ This is more or less exactly the intuition pursued by Stump (1993: 456). On our proposal, this follows naturally as Specificity-driven competition between rules of impoverishment and rules of exponence once both are conceived of as VIs.

Another example of this kind of non-natural class of metasyncretism comes from Araona.¹¹ As Harley (2008) points out, in Araona, we see some clear patterns in the long forms of personal pronouns. There ergative/genitive is syncretism in all non-singular numbers in addition to the 3rd singular. The

⁹Given the metasyncretism of dative/ablative in the non-singular, the [±governed] and [±locative] features will also have to be deleted in these contexts.

¹⁰For the sake of simplicity, we treat this form as *-as* prior to any other phonological processes that may apply. It is possible there are class-specific allomorphs here.

¹¹The data are taken from Harley (2008) who draws them from the Surrey Syncretism Database that is in turn based on Pitman (1980). We use the name ‘Araona’ as in the original grammar and database report.

dual ERG/GEN forms appear to be derived from the addition of an infix *-a-* to the singular form, while the plural ERG/GEN forms involve suffixation of *-ja*.¹²

(61) *Personal pronouns (long forms only) in Araona* (Harley 2008: 284)

		singular	dual	plural
1.INCL	ABS		tseda	cuada
	ERG		tseada	cuadaja
	GEN			
1.EXCL	ABS	ema	tsema	cuama
	ERG	yama	tseama	cuamaja
	GEN	quima		
2	ABS	midya	metseada	micana
	ERG	midyaja	metseada	micanaja
	GEN	midqueda		
3	ABS	joda	huatseda	naeda
	ERG	huada	huatseada	naedaja
	GEN			

What we now need is a case decomposition which yields a natural class of ergative and genitive. We can assume that these two cases are distinguished from absolutive by the feature [\pm oblique] (we omitted this feature from the discussion of the Sanskrit cases, as they were all [$+$ oblique]). In addition, ergative and genitive can be assumed to differ along the [\pm structural] dimension (again, we do not place too much importance on the labels for these features). A reasonable decomposition of case features for present purposes is given in (62).

- (62) a. ABS: [$+$ structural, $-$ oblique, ...]
 b. ERG: [$+$ structural, $+$ oblique, ...]
 c. GEN: [$-$ structural, $+$ oblique, ...]

With this in place, we now need to define an impoverishment rule that we will apply to the ergative/genitive cells involved in the metasyncretism. Notice that it is not possible to define an impoverishment rule that would apply in all the relevant cells (Harley 2008 does not discuss the 3sg context) since this is not a natural class of any kind. With our new conception of VIs, an alternative becomes possible. We can propose an impoverishment VI that is underspecified for both person and number (63c). This VI can remove the ergative/genitive distinction in all cells in the paradigm. It is blocked, however, by more specific entries in the 1st exclusive singular and the 2nd singular. We list the 2nd person entries in (63a) and (63b).

¹²One might wonder whether the 3rd singular ERG/GEN form *huada* could also be analyzed as involving the infixation of *-a-* to the absolutive form *joda*, with some accompanying phonological changes. Without knowing anything about the plausibility of such changes, it does not seem desirable to do this since *hua-* is also found in the dual form of the 3rd person pronoun, suggesting it might be the pronominal stem. In fact, it seems that some further subanalysis of this paradigm is warranted, but we refrain from doing so here.

- (63)
- | | | | |
|----|-------------------------|---|--------|
| a. | [+2, +obl, +struc, +sg] | → | -yaja |
| b. | [+2, +obl, +struc, +sg] | → | -queda |
| c. | [+obl, ±struc, ...] | → | [+obl] |
| e. | [+obl, +pl] | → | -ja |
| d. | [+obl] | → | -a- |

As one can see, these exponent VIs are more specific than the impoverishment VI in (63c), meaning that the ergative/genitive distinction is retained in those contexts. Again, we have to ensure that the impoverishment VI is more specific than the entries in (63c,d). Since there are presumably more decomposed case features distinguishing ergative and genitive than we have considered here, these will be also have to be deleted by the VI in (63c), therefore rendering it more specific.

6 Conclusion

In this paper, we have argued that feature-changing rules are empirically justified (in light of divergent bidirectional syncretism in languages such as Nimboran), but should be implemented not as independent insertion rules, but instead subsumed under the more general format of realization rules. This move opens up a number of interesting new avenues for providing analyses of configurational exponence, periphrasis and non-natural classes of metasyncretism in Distributed Morphology. Allowing for the insertion mechanism to introduce features may also lead to new ways of understanding further recalcitrant morphological phenomena that have received to little to no attention in the DM literature, such as heteroclisis (Stump 2006), deponency (Müller 2013) and morphemes (Trommer 2016).

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