Bidirectional syncretism in Distributed Morphology: Evidence for markedness-driven feature insertion*

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1. Introduction

Mismatches in form and function in which a single morphological exponent is associated with multiple distinct morphosyntactic contexts pose an important challenge to any theory of inflectional morphology. The precise nature of the theoretical tools that should be used to account for syncretism has been the subject of long-standing debate in the morphological literature (e.g. Jakobson 1962, Bierwisch 1967, Zwicky 1985, Noyer 1998, Stump 2001, Bobaljik 2002, Baerman et al. 2005). Much of this debate has centered around the question of whether the mechanism for deriving syncretism should have any inherent restrictions (see Kramer 2016). In Distributed Morphology, it has been argued that the mechanisms for deriving syncretism, chiefly impoverishment, should be restricted relative by the markedness of the features involved (Noyer 1998, Bobaljik 2002, Harley 2008), whereas researchers working outside of DM have argued that the attested patterns of syncretism found in natural language require the full power of unrestrictive rules of referral (Stump 1993, 2001, Baerman 2004, Baerman et al. 2005, Spencer 2019).

One of the empirical domains in which this debate has played out involves bidirectional syncretism where a given paradigm contains multiple instances of marker spreading. Particular cases of bidirectional syncretism have been argued to be fatal for the markedness-driven DM approach to syncretism utilizing deletion of feature values by impoverishment (Stump 2001, Spencer 2019). In this paper, we will argue that this conclusion is premature. Once we take into account the system proposed in Noyer (1998), in which impoverishment may feed insertion of a contextually unmarked value, even the most challenging cases of bidirectional syncretism can be reconciled with a theory of syncretism in which syncretism is always markedness-reducing. Doing so, we argue, requires adopting a three-level contextual conception of markedness (cf. Nevins 2011).

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2. Directional syncretism

Before we discuss bidirectional syncretism, it is useful to establish some basic facts about syncretisms and provide some definitions. Following Stump (2001) we can distinguish at least three different types of syncretism. In this section we will illustrate these based on the forms of the plural declension for the Polish adjective *słaby* 'weak' given in (1). The first type, *unstipulated syncretism*, is a syncretism whose distribution can be captured with reference to a single feature value. This type is illustrated by the forms of the dative and the instrumental, *-ym* and *-ymi*, respectively. They are syncretic across gender and animacy but their distribution can be described with reference to the case feature values DATIVE and INSTRUMENTAL, respectively. A second type of syncretism Stump identifies is *symmetrical syncretism*. The distribution of such a syncretism requires stipulating a natural class of two (or more) feature values. In the paradigm in (1), this type is exemplified by the genitive and locative form *-ych* which is syncretic across all gender and animacy values, and crucially also across two case values. Its distribution can only be captured by postulating a natural class of GENITIVE ∪ LOCATIVE. The third type of syncretism, which is the one we will focus on in this paper, is *directional syncretism*. This type is instantiated when one cell unexpectedly takes the form originally associated with another cell. In the paradigm in 1, the occurrence of *-ych* in the human masculine accusative context constitutes such a directional syncretism because it seems to be taken over from the GEN∪LOC context.

(1) *Plural declension of Polish adjective* słaby *'weak'*

	Masculine		Feminine	Neuter
	human	non-human	(non-)human	(non-)human
NOM	słab-i	słab-e	słab-e	słab-e
ACC	słab-ych	słab-e	słab-e	słab-e
GEN	słab-ych	słab-ych	słab-ych	słab-ych
LOC	słab-ych	słab-ych	słab-ych	słab-ych
DAT	słab-ym	słab-ym	słab-ym	słab-ym
INS	słab-ymi	słab-ymi	słab-ymi	słab-ymi

There are broadly speaking two distinct ways in which inflectional morphology like that in (1) have been approached from a theoretical perspective. In a realizational paradigm-based approach, the paradigm in (1) is regarded as a basic entity of the theory. It provides a fixed number of cells that can be identified by a combination of values for each category that a given lexeme inflects for (i.e. case, gender and animacy in the Polish case). These cells have to be filled with a phonological form. In the postsyntactic DM approach, morphological forms realize feature bundles provided by the syntax. Under this view, paradigms and cells are epiphenomenal and only arise as the set of all possible feature bundles that the syntax can generate for a given lexeme. In the following section we will describe how each account handles the three types of syncretism found in the Polish data in (1), with a particular focus on directional syncretism.

In a realizational paradigm-based approach, unstipulated syncretism can be captured by having realization rules which refer to a single feature value. For dative and instrumental, whose distribution constitutes an entire row, this is straightforward, as given in (2). For symmetrical syncretism, it is necessary to define a stipulated natural class consisting of one or more feature values. Following the notational convention in Baerman (2004), we declare that two case values, e.g. NOM and ACC form a natural class that we can refer to by means of the index X (3a). The same thing can be done for genitive and locative, creating the distinct index Y (3c). The realization rules for forms whose distribution is a symmetrical syncretism will refer to the index X or Y rather than any particular case value, as in (3b,d).

(2) a. DAT → *-ym*
b. INS → *-ymi*

(3) a. NOM ∪ ACC → X
b. X → *-e*
c. GEN ∪ LOC → Y
d. Y → *-ych*

In order to account for directional syncretism, i.e. the unexpected spreading of the GEN/LOC form *-ych* to the accusative, paradigm-based approaches typically invoke a so-called *rule of referral*, such as the one in (4).

(4) ACC HUM MASC ⇒ GEN (HUM MASC)
'The accusative human masculine cell takes whatever form the genitive (human masculine) has.'

These rules state that a given cell in a paradigm takes the form associated with some other cell. One can think of this as a pointer to a different cell in the paradigm that should be used to determine a particular cell's form.[1] It is important that the rule in (4) overrides the otherwise expected rule, namely (3b). Given this assumption, then the rule of referral ensures that the 'wrong' form associated with another cell (*-ych*) is inserted over the form that would be expected given the cell specification (*-e*). This bleeding of insertion of an expected form is how the 'spreading' we find in directional syncretism is derived.

In the DM approach to syncretism, it is often assumed that traditional grammatical categories such as case are decomposed into sub-features, which can then be utilized to derive syncretism via underspecification (Jakobson 1962, Bierwisch 1967). While the labels used for these features are often assumed to be tied to some contentful syntactic or semantic distinction, e.g. [±oblique, ±governed], we simply use abstract features [±a, ±b, . . .] for convenience. As mentioned above, DM does not take the paradigm as a primitive of the theory. Inside a paradigm cell is simply a particular combination of morphosyntactic features that are present on a terminal node in the syntactic structure. Assuming a full cross-classification, however, we can represent all possible feature combinations in a paradigm-like representation. On our view the Polish paradigm in (1) would look as in (5).

[1] In Stump's (2001) implementation, rules of referral involve a kind of counterfactual feature change. The ordinary realization rules apply as if the cell had the specification of the cell targeted by the rule of referral. No actual change in the featural make-up of the cell is assumed in this approach, though (but cf. Stump 2016).

(5)

	Masculine		Feminine	Neuter
	[+human]	[−human]	[±human]	[±human]
NOM	*-i*	*-e*	*-e*	*-e*
[+a, +b, +c]	[+a, +b, +c]	[+a, +b, +c]	[+a, +b, +c]	[+a, +b, +c]
ACC	*-ych*	*-e*	*-e*	*-e*
[+a, −b, +c]	[~~+a~~, −b, +c]	[+a, −b, +c]	[+a, −b, +c]	[+a, −b, +c]
GEN	*-ych*	*-ych*	*-ych*	*-ych*
[−a, −b, −c]	[−a, −b, −c]	[−a, −b, −c]	[−a, −b, −c]	[−a, −b, −c]
LOC	*-ych*	*-ych*	*-ych*	*-ych*
[−a, −b, +c]	[−a, −b, +c]	[−a, −b, +c]	[−a, −b, +c]	[−a, −b, +c]
DAT	*-ym*	*-ym*	*-ym*	*-ym*
[−a, +b, −c]	[−a, +b, −c]	[−a, +b, −c]	[−a, +b, −c]	[−a, +b, −c]
INS	*-ymi*	*-ymi*	*-ymi*	*-ymi*
[−a, +b, +c]	[−a, +b, +c]	[−a, +b, +c]	[−a, +b, +c]	[−a, +b, +c]

In order to account for the various realizations, we need to specify a Vocabulary Item (VI) for each exponent. These are given in (6) in decreasing order of specificity. The morpheme *-i* has a full feature specification since it occurs in only a single cell. For unstipulated syncretism with *-ym* and *-ymi*, these exponents make reference to a full case specification, but are underspecified with respect to gender and animacy. For symmetrical syncretism such as with *-e*, we can make reference to only the decomposed features that the two syncretized case features have in common, namely [+a] and [+c]. The same underspecification applies to *-ych*, whose distribution spans ACC, GEN and LOC contexts (which have only [−b] in common).

(6)

a. [+a, +b, +c, +hum, masc] ↔ *-i*
b. [−a, +b, −c] ↔ *-ym*
c. [−a, +b, +c] ↔ *-ymi*
d. [+a, +c] ↔ *-e*
e. [−b] ↔ *-ych*

less specific ↓

We do not find *-e* in nominative masculine human contexts since its VI in (6d) is blocked by the more specific exponent *-i* in (6a). However, given the rules in (6), we would expect *-e* to block *-ych* in accusative masculine human contexts, contrary to fact. This case of directional syncretism is typically captured in DM by the deletion of feature values prior to insertion. This can be achieved by the impoverishment rule in (7), which deletes the sub-feature [+a] in the human masculine.

(7) *Impoverishment rule*

[+a] → Ø / [masc], [+hum], [−b]

The deletion of [+a] bleeds insertion of the expected marker in (7d) (by removing one of the features it realizes) and instead we have insertion of the next most specific matching exponent *-ych* (7e). This is what is known as 'Retreat to the General Case' (Halle and Marantz 1993, 1994).

This approach to syncretism by means of feature deletion, coupled with the idea that less specific exponents correspond to less marked forms, means that impoverishment will always involve a reduction in markedness. As Bobaljik (2002:64) puts it, 'impoverishment rules [...] embody the hypothesis that true syncretism [...] will always be neutralizations towards lesser marked forms'. We summarize this hypothesis, as it holds for directional syncretism, as the *Unmarkedness Hypothesis*:

(8) *Unmarkedness Hypothesis (version 1)*
If a cell X takes the exponent associated with another cell Y, then the feature specification of Y's exponent is less marked than the feature specification of X's exponent. (Directional syncretism involves spreading of less marked exponents.)

Since DM offers, at least in principle, a theory of possible syncretisms that is constrained by markedness, it has been argued to be a potential virtue of impoverishment over rules of referral. Whether this is actually true is of course an empirical matter. If one can find challenging cases of syncretism that are not compatible with this view, then the Unmarkedness Hypothesis as it follows from the assumptions of DM would have to be abandoned. Indeed, precisely this kind of falsification is exactly what certain critics of DM have claimed that instances of so-called 'bidirectional syncretism' provide (Stump 2001:236; Spencer 2019:25). It has been claimed that such cases necessitate the explanatory power of unrestricted rules of referral as a tool for modelling syncretism.

3. Bidirectional syncretism

A fourth type of syncretism that Stump (2001) identifies in his typology is *bidirectional syncretism (BDS)*. Bidirectional syncretism holds if there are two distinct instances of directional syncretism within the same paradigm. Furthermore, Baerman (2004) identified two sub-types of BDS: convergent BDS and divergent BDS, which are summarized below.

(9) *Convergent BDS*

	x	y
1	A ↓	A
2	A ↓	↑ B
3	B	↑ B

(10) *Divergent BDS*

	x	y	z
1	↓ A	A	B ↑
2	↓ A	B	B ↑

In convergent BDS, each of the directional syncretisms has the same target. In (9), the form A spreads from 1 to 2 in context *x*, while the form B spreads from 3 to 2 in context *y*. They therefore converge on the same target value, namely 2. In divergent BDS, the target of one directional syncretism is the source of the other. In (10), the form A spreads from 1 to 2 in context *x* and from 2 to 1 in context *z*. In the following, we will show some concrete

instantiations of these patterns and how one could try to analyse them in both paradigm-based and impoverishment-based accounts.

3.1 Convergent bidirectional syncretism

An example of convergent BDS discussed in Baerman (2004) is given in (11). In Bonan, there is directional spreading from GEN to ACC in nouns and from DAT to GEN in pronouns.

(11) *Case declension in Bonan*

	NOUN 'house'	PRONOUN 'I'
NOM	labčo-Ø	ndža-Ø
GEN	labčo-ne	ndža-ne
ACC	labčo-ne	ndža-de
DAT	labčo-de	ndža-de
ABL	labčo-se	ndža-se
INS/COM	labčo-Gale	ndža-Gale

In a paradigm-based approach, one can simply assume that nouns and pronouns in Bonan lack a dedicated form for the accusative. Considering the relevant part of the paradigm, the realization rules in (12) will therefore only specify forms for the genitive and dative, but not accusative. In order to determine the form of the accusative, there are two distinct rules of referral (one for nouns and one for pronouns) that state that the accusative takes the form of the genitive with nouns and the form of the dative with pronouns.

(12) *Realization rules*

a. GEN → *-ne*
b. DAT → *-de*

	NOUN	PRON
GEN	-ne	-ne
ACC		
DAT	-de	-de

(13) *Rules of referral*

a. ACC NOUN ⇒ GEN (NOUN)
b. ACC PRON ⇒ DAT (PRON)

In a DM analysis, on the other hand, one has to assume that the two markers *-ne* and *-de* have an overlapping distribution in the accusative. In order to achieve this we decompose the case features in such a way that the feature specification for accusative shares a sub-feature with both genitive and dative. We will specify *-ne* for the feature shared between GEN and ACC ([+a]) and *-de* for the one shared by DAT and ACC ([+b]), as shown in (14).

(14) *Vocabulary Items for Bonan*

a. [+a] → *-ne*
b. [+b] → *-de*

	NOUN	PRON
GEN [+a, −b]	-ne	-ne
ACC [+a, +b]	-ne/-de	-ne/-de
DAT [−a, +b]	-de	-de

The problem here is that there is an indeterminacy in the accusative (14). Both of the VIs in (13) are equally specific and therefore expected to both be candidates for insertion. This is not what we want, however. We need to block *-de* in the accusative with nouns and block *-ne* in the accusative with pronouns. There are two potential solutions to this indeterminacy problem. In her analysis of Bonan, Harley (2008) proposes an impoverishment rule that deletes [+a] with nouns. This bleeds insertion of the marker in (13a), thereby resolving the indeterminacy. In order to block *-ne* with pronouns, Harley appeals to the idea of a markedness hierarchy for the decomposed case features. Since (15b) stipulates that [+b] is a less marked feature value than [+a], when both are possible candidates for insertion, the VI realizing the less marked feature will win, i.e. (14b). While this works, the idea of a markedness hierarchy for sub-features that is divorced from context may be problematic (see section 4). An entirely viable alternative, however, is to propose a second impoverishment rule for pronouns, too (16).

(15) *Solution #1* (Harley 2008): impoverishment + feature hierarchy

a. [+b] → Ø / ___ [+a], [NOUN] (impoverishment rule)
b. [+a] ≻ [+b] (feature hierarchy)

(16) *Solution #2*: Two impoverishment rules

a. [+b] ↔ Ø / ___ [+a], [NOUN] (impoverishment rule)
b. [+a] ↔ Ø / ___ [+b], [PRON] (impoverishment rule)

The conclusion we can draw here is that convergent BDS is not a challenge for rules of referral or for impoverishment-based analyses.

3.2 Divergent bidirectional syncretism

Turning now to divergent BDS, a representative example from Baerman (2004) involves case declension in Latin. In inflection class II (masculine nouns), the nominative is realized as *-us* and the accusative is realized as *-um*. Neuters in inflection class I, such as *bellum* 'war', take the accusative ending *-um* in the nominative, too. Neuters in inflection class III like *vulgus* 'crowd', however, take the nominative ending *-us* in the accusative. As such, these directional syncretisms have divergent targets.

(17) *Singular case declension in Latin*

	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

Focussing just on the relevant part of the paradigm, when developing a DM approach using underspecification and impoverishment, we could start out by fully specifying the *-us* and *-um* endings for nominative and accusative (18), as we find in class II.

(18) *Vocabulary Items for Latin*
a. [+a, −b] ↔ *-us*
b. [+a, +b] ↔ *-um*

	I	II	III
NOM [+a, −b]	-us	-us	-us
ACC [+a, +b]	-um	-um	-um

Given this basic distribution, we would then have to try to use the impoverishment rule in (19) to bleed insertion of *-um* in class I. As a result of this, we would have to adjust the specification for *-um* so that it can fit in both nominative and accusative contexts. We can therefore underspecify it for the feature that they have in common in our decomposition, namely [+a] (20).

(19) *Impoverishment rule I*
[−b] → Ø / ___ [+a], [I]

(20) *Vocabulary Items for Latin*
a. [+a, −b] ↔ *-us*
b. [+a] ↔ *-um*

	I	II	III
NOM [+a, −b]	[+a, −b] ⇓ [+a,] ⇒ -um	-us	-us
ACC [+a, +b]	-um	-um	-um

With this in place, we now have to bleed insertion of *-um* in class III. To do this, we need another impoverishment rule that deletes [+b] in the accusative of class III nouns (21). The problem we face now becomes apparent. In order for *-us* to be eligible for insertion in both contexts, it also has to be underspecified for the shared feature of NOM and ACC, namely [+a], as in (21b).

(21) *Impoverishment rule II*
[+b] → Ø / ___ [+a], [III]

(22) *Vocabulary Items for Latin*
a. [+a] ↔ *-us*
b. [+a] ↔ *-um*

	I	II	III
NOM [+a, −b]	-um	-us	-us
ACC [+a, +b]	-um	-um	[+a, +b] ⇓ [+a,] ⇒ -us

The problem we face now becomes apparent. Irrespective of how we block the corner cells, the exponents *-um* and *-us* require a fully overlapping distribution. The consequence of this is complete indeterminacy throughout the paradigm, as show in (23).

(23)

	I	II	III
NOM [+a, −b]	-us/-um	-us/-um	-us/-um
ACC [+a, +b]	-us/-um	-us/-um	-us/-um

This differs from the Bonan example, where we only had a partially overlapping distribution. There is no good way to resolve this on a feature-manipulation view of syncretism that has to make do with underspecification and impoverishment, which was essentially the point that Baerman (2004) made.

This pattern is, of course, unproblematic for rules of referral. Here, the analysis is relatively straightforward. We can specify the forms *-us* and *-um* for nominative and accusative, respectively, as we see in class II (24). These basic rules are then superseded by the two specific rules of referral in (25), which state the respective take-overs from nominative and accusative in classes I and III.

(24) *Realization Rules for Latin*
   a. NOM → *-us*
   b. ACC → *-um*

	I	II	III
NOM	-um	-us	-us
ACC	-um	-um	-us

(25) *Rules of Referral for Latin*
   a. NOM ⇒ ACC in class I
   b. ACC ⇒ NOM in class III

For this reason, divergent BDS seems to pose a serious challenge for the DM approach to syncretism. In fact, it has also been argued to prove fatal for the idea that directional syncretism can be constrained by markedness (Stump 2001, Baerman et al. 2005). There is a very simple reason for this. If directional syncretism always involves blocking of insertion of a more marked exponent in favor of a less marked exponent, then we would have to conclude based on class I that the ACC form *-um* is more marked than the NOM form *-us*. This is directly contradicted by what we have to say about class III where *-us* spreads to the expected context for *-um*, meaning that *-us* is less marked than *-um*. Regardless of what we say about the markedness relation between the two forms, there will necessarily be a contradiction in cases of divergent BDS.

4. Proposal

We will show that there is a relatively straightforward solution to the apparent challenge that divergent BDS poses to the impoverishment approach once we adopt the view of impoverishment proposed in Noyer (1998). In order to account for systematic number neutralizations in Nimboran, Noyer (1998) proposes that impoverishment can feed insertion of a contextually unmarked value by a persistent redundancy rule (also see Harbour 2003; Calabrese 2011; Arregi and Nevins 2012 for similar proposals). In order to see how this works, we have to consider that traditional markedness hierarchies also correspond to our now decomposed case features. If we decompose NOM and ACC into [±a, ±b] as we have done, then the feature combination corresponding to NOM will count as less marked given the hierarchy in (26).

(26) *Markedness hierarchy for case*

$$\ldots \succ \underset{[+a,\,+b]}{\text{ACC}} \succ \underset{[+a,\,-b]}{\text{NOM}}$$

Another way of thinking about this is to say that [−b] is the unmarked value in the context of [+a] since together with [+a] it yields the unmarked case NOM.

Given these assumptions, Noyer's core proposal is that when impoverishment deletes the marked value of a particular feature combination, then a persistent redundancy rule can insert the corresponding unmarked value. So if we have an impoverishment rule deleting [+b] in the context of [+a] (27a), then the redundancy rule in (27b) can apply afterwards to insert the unmarked value in the context of [+a], namely [−b].

(27) a. *Impoverishment rule*
[+b] → Ø / ___ [+a]
b. *Redundancy rule*
Ø → [−b] / ___ [+a]

[+a, +b]	(ACC)
[+a,]	(by 27a)
[+a, −b]	(NOM) (by 27b)

As such Noyer's approach can turn an accusative context into a nominative context. Importantly, however, it could never turn a nominative into an accusative since by assumption there can be no redundancy rule inserting the marked value [+b] in the context of [+a] if only insertion of unmarked values is possible.

4.1 Reanalyzing divergent BDS

With this assumption in place, we can now derive the problematic case of divergent BDS in Latin. Let us again start by treating *-um* and *-us* as fully specified, as in (28). Focussing on the accusative in class III, we can adopt the impoverishment rule in (29) to delete the [+b] value in the accusative specification. Following Noyer's proposal, since this is the marked value in the context of [+a], the redundancy rule in (30) can insert the unmarked value in the context of [+a], namely [−b]. Now, the accusative context has been turned into a fully specified nominative context and the form in (28a) can be inserted.

(28) *Vocabulary Items for Latin*
a. [+a, −b] → *-us*
b. [+a, +b] → *-um*

(29) *Impoverishment rule I*
[+b] → Ø / ___ [+a], [III]

(30) *Redundancy rule*
Ø → [−b] / ___ [+a]

	I	II	III
NOM [+a, −b]	[+a, −b]	-us	-us
ACC [+a, +b]	-um	-um	[+a, +b] ⇓ [+a,] ⇓ [+a, −b] ⇒ -us

Now, we need to deal with the nominative in class I. In order to bleed insertion of the accusative form, we need to delete [−b] by means of the impoverishment rule in (31). If we then underspecify the *-um* exponent for the feature shared between NOM and ACC ([+a]), as in (32), then we can insert *-um* in both contexts for class I.

(31) *Impoverishment rule II*
[−b] → Ø / ___ [+a], [I]

(32) *Vocabulary Items for Latin*
a. [+a, −b] → *-us*
b. [+a] → *-um*

	I	II	III
NOM [+a, −b]	[+a, −b] ⇓ [+a,] ⇒ -um	-us	-us
ACC [+a, +b]	-um	-um	-us

At this point, one might wonder why the redundancy rule in (30) does not also apply in this case. If [−b] were re-inserted at this point, then we would arrive back at a nominative specification and expect the exponent *-us* to be inserted in class I nominatives. We can avoid this Duke-of-York derivation, however, if we adopt Noyer's assumption that, once deleted, an unmarked value may not be reinserted.[2] With this assumption, we have two distinct contexts for the two corner cells targetted by directional syncretism: one involves a feature change from an accusative to a fully specified nominative, and the other involves a change from a nominative to an underspecified context. It is this distinction, made possible by Noyer's system, that allows us to provide an analysis of the challenging pattern of divergent BDS.

4.2 Unmarkedness Hypothesis

One might wonder whether this account is still compatible with the Unmarkedness Hypothesis in (8), which stated that directional syncretism always involves insertion of a less marked form over a more marked one. The answer is clearly no. Given the entries for the Latin case suffixes that we assumed above, *-um* is less specific and should therefore count as less marked than *-us* (33).

(33) *Markedness of Latin Vocabulary Items*
a. [+a, −b] → *-us*
b. [+a] → *-um*
↓ less marked

Nevertheless, in class III, the more marked exponent *-us* spreads to ACC (blocking less marked *-um*). This is not compatible with the Unmarkedness Hypothesis as it was stated in (8). But this is not the only way to conceive of markedness, as it relates to syncretism. Noyer actually suggests a different view of markedness that does not talk about markers but rather about contexts: 'Impoverishment-plus-Insertion will always move from a more marked to a less marked state' (Noyer 1998:282). If we reformulate the Unmarkednes Hypothesis in the following way, this is no longer problematic:

(34) *Unmarkedness Hypothesis (version 2)*
If a cell X takes the exponent associated with another cell Y, then there must be a reduction in the markedness of the feature specification of X.
(Directional syncretism involves a change from a more marked to a less marked feature combination.)

[2] Noyer (1998:276, fn.6) suggests that this may follow from disjunctive blocking.

This shows that even divergent BDS, which involves contradictory directional spreading on the surface, can be reconciled with a unidirectional restriction on markedness. This requires that we now distinguish three levels of relative markedness, as impoverishment can have two distinct outcomes in the current approach. For a given combination of features, there is the contextual marked value ([+b]), the contextually less marked value ([−b]), and the contextually least marked value ([Øb], i.e. the absence of [b]):

(35) *Three-level contextual markedness*

most marked	≻	**less marked**	≻	**least marked**
[+a, +b]		[+a, −b]		[+a, Øb]
ACC		NOM		under-determined

On this view, contextual markedness is reduced in each of the directional syncretisms involved in divergent BDS (36).

(36)

	I	II	III
NOM [+a, −b]	[+a, −b] ⇓ [+a, Ø]	-us	-us
ACC [+a, +b]	-um	-um	[+a, +b] ⇓ [+a, −b]

In conclusion, not only is it possible to reconcile divergent BDS with an impoverishment-based approach, it is also possible to uphold the Unmarkedness Hypothesis in light of this apparent counterexample to it (*pace* Stump 2001, Baerman 2004).

4.3 Reanalyzing convergent BDS

An interesting consequence of this proposal is that it allows us to reanalyze cases of convergent BDS, too. Recall from section 3.1 that we required two impoverishment rules and a partially overlapping distribution of the two case markers in Bonan in order to derive convergent BDS. In Noyer's system, we can actually assume that *-de* is the underlying accusative marker that is underspecified to fit both ACC and DAT contexts, as in (37). We then require just the impoverishment rule in (38) (which feeds a persistent redundancy rule) to cause the genitive marker *-ne* to spread to the accusative in nouns.

(37) *Vocabulary Items for Bonan*
a. [+a, −b] → *-ne*
b. [+b] → *-de*

(38) *Impoverishment rule*
[+b] → Ø/ ___ [+a], [NOUN]

(39) *Redundancy rule*
Ø→ [−b] / ___ [+a]

	NOUN	PRON
GEN [+a, −b]	-ne	-ne
ACC [+a, +b]	[+a, +b] ⇓ [+a,] ⇓ [+a, −b] ⇒ -ne	-de
DAT [−a, +b]	-de	-de

On this analysis, convergent BDS is not actually bidirectional syncretism at all. There is a single instance of directional syncretism. Furthermore, the Unmarkedness Hypothesis dictates which of the syncretisms is directional. We can turn ACC into less marked GEN (spreading *-ne*) but not into more marked DAT (spreading *-de*). One could then argue that this analysis is simpler than the one in (16) as it only requires one impoverishment rule, instead of two (we take redundancy rules to be universal). Given Ockham's Razor, it should therefore be preferred.

5. Conclusion

Bidirectional syncretism, in particular cases of divergent BDS, has been argued to pose a fatal challenge to impoverishment-based analyses of directional syncretism. Spencer (2019:25) claims that BDS is 'exclude[d] categorically' by DM theories, while Stump (2001:236) argued that BDS 'empirically disconfirm[s]' the Unmarkedness Hypothesis. As we have illustrated, once the nuances of Noyer's proposal are taken into account, this is simply not true.

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