Feature (non-)insertion in a minimalist approach to spellout

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1 Abstract

Most current theories of inflection violate basic minimalist principles by assuming the doubling of structure-building operations in the lexicon or a big variety of morphological rules and constraints (e.g. Halle and Marantz, 1993). In this paper, I propose an approach to morphological spellout which is restricted to the application of a single generalized transformation which deletes morphosyntactic features and inserts phonological features specified lexically in vocabulary items. Based on data from Georgian, I show that this approach allows to account for Elsewhere effects and feature neutralization. I argue that Nimboran data provided by Harbour (2000) as evidence against a minimalist approach to spellout are consistent with this model if syntactic features are represented in a feature-geometric model as in Harley and Ritter (2002).

2 Morphology and structure-building operations

Lexicalist approaches to morphology (e.g. DiSciullo and Williams, 1987; Wunderlich and Fabri, 1994) assume that there are at least two structure-building modules of the grammar, syntax and an independent presyntactic morphology component. Distributed Morphology (DM; e.g. Bonet, 1991; Noyer, 1992; Halle and Marantz, 1993) avoids this doubling of structure-building devices by locating the morphology module *after* syntax. Morphology in DM does not create new structure, but interprets the output of syntax by inserting vocabulary items (VIs, i.e. pairs of morphosyntactic features and phonological forms) into syntactic heads lacking any phonological content. Before Vocabulary Insertion, a number of language-specific operations apply which modify the output of syntax to account for syntax-morphology mismatches. The most important types of such operations are listed in (1):

(1) a. **Impoverishment:** deletes morphosyntactic features
b. **Fusion:** fuses different heads into one
c. **Fission:** dissects a single head into different separate heads

Similarly to Vocabulary Insertion, these operations do not create new structure. Instead they delete syntactic features or group already existing features in different ways. In Trommer (1999), I propose to reduce all post-syntactic operations of standard DM to one, namely insertion of a (possibly phonologically zero) vocabulary item, which is always accompanied by feature deletion. This generalized transformation is formulated in (2):

(2) **Vocabulary Insertion:** If *M* is a VI with syntactic features α and phonological features β, and *S* is a head with features γ, where α is a subset of γ, then delete the features of α in γ and add β to the phonological representation associated with *S*.

I call the resulting model *Minimalist Distributed Morphology* (MDM) since it completely abandons insertion of features after syntax, and, following the Minimalist Program in syntax (Chomsky, 1995, 2000), reduces grammatical machinery to minimal and virtually indispensable operations.

However, Noyer (1998) argues, based on data from the Papuan language Nimboran, that postsyntactic feature insertion is necessary even in DM, and Harbour (2000) takes the same data to be direct counterevidence against Minimalist DM. In this paper, I show that the arguments by Noyer and Harbour are not compelling once their representation of features, which is problematic for independent reasons, is abandoned. I demonstrate that MDM actually allows a simpler analysis of the relevant data. In section 3, I illustrate the functioning of Minimalist DM using data from Georgian verb agreement and compare this analysis with the one of Halle and Marantz (1993). In section 4, I introduce the Nimboran data from Noyer (1998) and show why they seem to be problematic for MDM. I present an alternative analysis without feature insertion in section 5. In section 6, I argue that this approach - while flexible enough to handle the Nimboran data - imposes substantive restrictions on possible syncretisms in number agreement. Section 7 provides a short summary of the paper.

3 Georgian verb agreement: minimalist DM vs. standard DM

In Georgian (Carmack, 1997), verb agreement with subjects and objects is partly achieved by prefixes, and partly by suffixes. Thus for all forms in (3), second person of the object is marked by the prefix *g-*. 3pl subject agreement is marked by the suffix *-en* in (3b,d) and plurality of the object by the suffix *-t* in (3c).

(3) a. *g-xedav*
O2-see
'I see thee'

b. *g-xedav-en*
O2-see-S3p
'they see thee'

c. *g-xedav-t*
O2-see-PL
'I see you (pl.)'

d. *g-xedav-en/*g-xedav-en-t/*g-xedav-t-en*
O2-see-S3p
'they see you (pl.)'

Interestingly, plural *-t* is suppressed when the subject is 3pl (3d). In other words, the number contrast for 2nd person objects is neutralized with 3pl subjects, thus (3b) and (3d) are identical. Considerably simplifying with regard to the complex Georgian case system, I assume here that subject agreement affixes are

characterized as [+Nom] and object agreement affixes as [+Acc]. Thus, we get the following vocabulary items:

(4) **Vocabulary items for Georgian**

g- : [+Acc+2]
-en : [+Nom+3+pl]
-t : [+pl]

With Nash-Haran (1992) and Halle and Marantz (1993), I assume that all prefixal agreement and the number suffix *-t* spell out clitic heads, while all other suffixal agreement realizes agreement proper. Thus the form 'they see you (pl.)' corresponds roughly to the (partial) syntactic representation [+Acc+2+pl] [+V] [+Nom+3+pl]. (5) shows the derivation of this form (right column) and 'I see you (pl.)' according to the analysis of Halle and Marantz (1993):[1]

(5) **Derivation of 1sg → 2pl and 3pl → 2pl forms in standard DM**

	2pl ← 1sg	**2pl ← 3pl**
Syntax	[+Acc+2+pl] V	[+Acc+2+pl] V [+Nom+3+pl]
Fission	**[+Acc+2]** V **[+pl]**	**[+Acc+2]** V [+Nom+3+pl] **[+pl]**
Impoverishment	[+Acc+2] V [+pl]	[+Acc+2] V [+Nom+3+pl] ∅
Vocabulary Insertion	***g-*:**[+Acc+2] V ***–t*:**[+pl]	***g-*:**[+Acc+2] V ***–en*:**[+Nom+3+pl]

The first operation which applies is Fission which takes the features of the head [+Acc+2+pl] in both inputs and distributes it into two different heads [+Acc+2] and [+pl]. Note that there are actually no linear-order relations between heads before Vocabulary Insertion. Thus, the ordering of the heads in (5) reflects just expository convenience. An Impoverishment rule deletes the plural head in the context of [+Nom+3+pl], and effects the number neutralization which was discussed above. Finally, vocabulary items are inserted into the resulting heads. The main theoretical advantage of MDM is that it eliminates the big variety of rule types found in standard DM. I will use the forms in (5) to show this point and will start with Impoverishment.

In standard DM, zero VIs and Impoverishment have identical effects in cases where underlying syntactic heads are not overtly expressed. Thus in (5), the Impoverishment rule which is roughly (6a) could be replaced by the zero vocabulary item in (6b):

[1] Halle and Marantz characterize objects as DAT (dative). To enease comparison of my analysis with theirs , I replace this in the following by [+Acc].

(6) a. [+pl] → ∅ / [+Nom+3+pl]
b. ∅:[+pl] / [+Nom+3+pl]

I take this ambiguity which allows different formal mechanisms to effect the same neutralization effects as evidence that the theory is too rich because it does not sufficiently constraint possible grammars. One might object that insertion of zero VIs is only equivalent to complete, but not to partial Impoverishment of a head, but this is not true when Fission is taken into account. Since part of a head can be fissioned of and a zero VI can then be inserted into the detached feature bundle, zero Vocabulary Insertion (in tandem with Fission) can simulate the effect of partial Impoverishment. Indeed, this is what would happen in (5) if (6a) is replaced by (6b): From the local perspective of Vocabulary Insertion all features of a head ([+pl]) are deleted, but from the more global perspective of spellout, only part of the head as it comes from syntax ([+Acc+2+pl]) is deleted. Thus it seems that zero Vocabulary Insertion can in practice mimic Impoverishment. Theoretically, there are two important differences in standard DM between these two rule types:

- After Impoverishment, further spellout operations are possible, but not after Vocabulary Insertion
- Impoverishment consumes features, (zero) Vocabulary Insertion does not

In MDM, these differences are eliminated: Vocabulary Insertion, just as Impoverishment, always deletes features, and the stipulation that only one VI can be inserted into one head is dropped. Thus there is no more use for Impoverishment as an independent rule type. However, the stipulation that only one VI can be inserted into a given head can be derived in many cases as a byproduct of feature deletion. Thus, in German plural verb agreement such as in (7) for the verb *waten*, 'to wade', the items *-en*:[+pl] and *-et*:[+2+pl] compete for insertion:

(7) **Present tense indicative paradigm of German *waten,* 'to wade'**

	sg	**pl**
1	*wat-e*	*wat-en*
2	*wat-est*	*wat-et*
3	*wat-et*	*wat-en*

For 1pl ([+1+pl]) and 3pl ([+3+pl]) inputs, only *-en*:[+pl] can be inserted, but for the input [+2+pl] (2pl), both VIs would be possible. The Elsewhere Principle[2] ensures that *-et*:[+2+pl] specifying a superset of the syntactic features of *-en:*[+pl] has precedence.

[2] The Elsewhere Principle in its application to morphology is also called "Subset Principle" in much of the DM literature (e.g. Halle and Marantz, 1993).

(8) **Derivation of agreement in German plural verb forms**

[+1+pl]	[+2+pl]	[+3+pl]	
~~———————~~	~~[+2+pl]~~ ***-et***	~~———————~~	*-et*:[+2+pl]
[+1~~+pl~~] ***-en***	~~———————~~	[+3~~+pl~~] ***–en***	*-en*:[+pl]

The fact that *-en*:[+pl] is not inserted in addition to *-et*:[+2+pl] follows from the deletion of [+2+pl] at the insertion of *–et*, which leaves no features which could be targeted by subsequent Vocabulary Insertion. Thus, the assumption that feature deletion is an essential part of Vocabulary Insertion excludes in many cases insertion of further VIs.

Nonetheless, multiple insertion of VIs into the same head is a technical possibility of the system and should hence be empirically attested. Indeed, as noted by Noyer (1992) and Halle (1997), Fission can be interpreted as successive Vocabulary Insertion. Interpreting Fission in this way also has the welcome consequence that Fission just as Impoverishment can be eliminated from the theory of grammar as an independent operation type. In MDM, its effects follow from the only operation available: Vocabulary Insertion. (9) shows how the Georgian cases of Fission can be captured. First, in both forms, *g-*:[+Acc+2] is inserted deleting the features [+Acc+2] of the clitic head but leaving [+pl] untouched which hence remains a target for successive insertion of *-t:*[+pl]. Additionally, in the 3pl → 2pl form, the zero VI from (6b) is inserted before *-t*:[+pl] can target the plural feature. Since [+pl] is deleted, *-t*:[+pl] cannot be inserted any more:[3]

(9) **Multiple Vocabulary Insertion into the same head in MDM**

2pl ← 1sg	**2pl ← 3pl**	
[+Acc+2+pl] V	[+Acc+2+pl] V [+Nom+3+pl]	
~~[+Acc+2]~~ ***g-*** V [+pl]	~~[+Acc+2]~~ ***g-*** V [+Nom+3+pl] [+pl]	*g-*:[+Acc+2]
~~———————~~	*g-* V [+Nom+3+pl] ~~[+pl]~~	*∅:*[+pl] / +Nom+3+pl]
g- V ***-t*** ~~[+pl]~~	~~———————~~	*-t:*[+pl]
~~———————~~	*g-* V ***-en*** ~~[+Nom+3+pl]~~	*-en*:[+Nom+3+pl]

Note that this derivation is not only simpler in using fewer *types* of operations than the standard DM analysis in (5), it also involves fewer *instances* of operation steps. Thus the derivation in (5) requires insertion steps for all overt VIs, and additionally Fission and Impoverishment. The derivation in (9) requires, apart of overt Vocabulary Insertion, only insertion of one zero VI. Thus, abandoning

[3] I assume that clitic heads in Georgian are generally spelled out before agreement. This explains why *-en* is inserted last in the derivation. For the rest, the more specific VI is again inserted first according to the Elsewher Principle. The order of *g-*:[+Acc+2] and : *∅:*[+pl] / [+Nom+3+pl] is problematic to determine but irrelevant, since both possible orders lead to the same outputs.

Impoverishment and Fission in MDM does not lead to more complex analyses, but on the contrary to the elimination of derivational complexity. Additional evidence for this point comes from a closer inspection of Georgian prefixes (clitics). Plurality of 1st and 2nd person arguments is in most cases expressed by the suffix *-t* (10a,b). 1st person singular object agreement is marked by the prefix *m-*:

(10) a. *v-xedav-t*
S1-see-PL
'we see (him)'

b. *g-xedav-t*
O2-see-PL
'I see you (pl.)'

c. *m-xedav*
O1-see
'you (sg.) see me'

However, *m-* and *-t* are suppressed in the expression of 1st person and plural for 1pl objects, where we find the 1pl object prefix *gv-* instead (11a). Note that *-t* is not generally blocked in 1pl object forms where it expresses plurality of 2nd person plural subjects (11b):

(11) a. *gv-xedav/*gv-xedav-t/*m-xedav-t*
O1p-see
'you (sg.) see us'

b. *gv-xedav-t/*gv-xedav*
O1p-see-PL
'you (pl.) see us'

In a standard DM analysis which is based on fissioning of [+pl] in the forms in (10), it must be explained why there is no fissioning for the 1pl object head in (11). Halle and Marantz (1993:118) achieve this by stipulating an exception statement in the formulation of their Fission rule:

(12) Cl + Stem → [+pl] +Cl +Stem (linear order irrelevant)
|
[+pl] *unless* the [+pl] is part of a [+1], ACC argument

Consider now the MDM derivation of the same facts. For the 2pl object form, Fission is effected as discussed above, but for the 1pl object, *gv-*:[+Acc+1+pl] is inserted which deletes [+1] and [+pl] and thus blocks by its insertion further insertion of *-t:*[+pl] and *m-*:[+Acc+1]:

(13) **Fission in MDM**

2pl ← 1sg	**1pl ← 2sg**	
[+Acc+2+pl] V	[+Acc+1+pl] V	
———	~~[+Acc+1+pl]~~ ***gv-***V	*gv-*:[+Acc+1+pl]
[~~+Acc+2~~ +pl] ***g-***V	———	*g-*:[+Acc+2]
———	———	*m-*:[+Acc+1]
~~[+pl]~~ *g*-V***-t***	———	*-t*:[+pl]

Thus in MDM, not only the Fission rule itself is eliminated. It also becomes unnecessary to stipulate any exception statement for 1pl object agreement. That *gv-* and not *m-* and *-t* are inserted in the first place follows from the Elsewhere Principle. Thus, an arbitrary exception in the standard DM analysis is reduced to the invocation of a general principle of linguistic theory. Again, the minimalist rule inventory of MDM leads to simpler not to more complex analyses.

4 Apparent feature insertion in Nimboran

While the minimalist approach to spellout is conceptually simpler and leads to simpler analyses in many cases, Harbour (2000) based on Noyer (1998) argues that it is untenable since it crucially relies on the assumption that all morphological operations are feature-deleting. Harbour and Noyer provide data from the Papuan language Nimboran (Anceaux, 1965; Inkelas, 1993) which seem to imply that feature-insertion at spellout is inevitable. In this section, I introduce the basic data and show why they are a potential problem for MDM. In section 5, I argue that these data can be captured without feature insertion once the feature system proposed by Harley and Ritter (2002) is assumed.

Nimboran has a rich suffixal morphology. Subject agreement is represented by two position classes, in many cases separated by other affixal material, where person and gender are mainly expressed by affixes of the more rightwards position class (*-u, -am, -e, -um*), while number is spelled out by affixes of the more leftwards position class (*-i, -k*):[4]

(14) **Subject agreement affixes (normal environment)**

	SINGULAR	**DUAL**	**PLURAL**
1	*. . . u*	*k. . . u*	*i. . . u*
12	*maN. . .ám*	*k. . .ám*	
2	*. . . e*	*k. . . e*	
3MASC	*. . . am*	*k. . . am*	*i. . . am*
3FEM/INAN	*. . . um*	*k. . . um*	

In special environments, such as the presence of the durative affix *-tam,* the distribution of these markers is slightly different:

[4] The 12 (first person inclusive) affix *-maN* is somewhat problematic for this characterization since it is specific to singular and 1st/2nd person. *-i* is actually a floating feature inducing palatalization under complex phonological conditions. However, the exact position of number and person in position classes is irrelevant for the following discussion.

(15) **Subject agreement affixes (special environment)**

	SINGULAR	DUAL	PLURAL
1	*. . .u*	*i. . .u*	
12	*maN. . .ám*	*i. . .ám*	
2	*. . .e*	*i. . .e*	
3 MASC	*. . .am*	*i. . .am*	
3 FEM/INAN	*. . .um*	*i. . .um*	

For reasons of space, I will restrict myself here to the number agreement of non-singular forms which exhibits the crucial problems for an approach without feature insertion.[5] Thus, we have to account for the distribution in (16):

(16) **Normal environment**

	DUAL	PLURAL
1	*k. . .*	*i. . .*
12	*k. . .*	
2	*k. . .*	
3	*k. . .*	*i. . .*

Special environment

	DUAL	PLURAL
1	*i. . .*	
12	*i. . .*	
2	*i. . .*	
3	*i. . .*	

The basic problem with these data is that there is neutralization in two opposite directions: In the 2nd person plural of the normal environment, the apparent plural marker *-i* is neutralized to the apparent dual marker *-k*, while *-k* is neutralized to *-i* for all forms of the special environment. If neutralization always involves feature deletion, features must be removed from the plural configuration to get the dual representation. To achieve neutralization in the opposite direction, features of the dual structure must be removed to get the plural structure. Simple mathematics suggests that this cannot work. This, of course, is a critical point for MDM where all neutralization involves insertion of zero VIs and hence feature deletion.

To make this point more clear, I will present here the analysis proposed by Noyer (1998) which explicitly involves feature insertion. Noyer assumes that number in Nimboran is represented as in (17) and subject number affixes by the VIs in (18):

(17) **Features**

SINGULAR = [+sg -pl]
DUAL = [-sg -pl]
PLURAL = [-sg +pl]

(18) **Vocabulary items**

-i : [+pl]
-k : [-sg]

[5] In Trommer (2001), I treat further details of Nimboran subject agreement.

This accounts immediately for the forms corresponding to the shaded cells in (19). Only *-k* can be inserted in the dual forms which are incompatible with *-i*:[+pl]. On the assumption that an additional mechanism ensures preference *of -i* over *–k,* and only one VI can be inserted into a given head, *-i* is expected for all plural forms:

(19) **Normal environment**

	DUAL	**PLURAL**
	[-sg -pl]	**[-sg +pl]**
1	*k*. . .	*i*. . .
12	*k*. . .	*k*. . .
2	*k*. . .	*k*. . .
3	*k*. . .	*i*. . .

Noyer captures the fact that *-k* extends to the plural forms in 2nd person forms of the normal environment by the Impoverishment rule in (20), which deletes [+pl] in non-singular 2nd person forms:

(20) **Impoverishment:** [+pl] → ∅ / [+2 -sg]

(21) shows the derivation of a 2pl form. After deletion of [+pl], *-k*:[-sg] is free to be inserted:

(21) **Derivation of 2pl forms**

[+2 +pl-sg]	Rule (20)	**IMPOVERISH**
[+2 –sg]	*-i* :[+pl]	———
[+2 –sg]	*-k*: [-sg]	**INSERT**
-k		

While the analysis so far gets the distribution of number affixes right for the normal environment, it gets the wrong results for all the forms corresponding to unshaded cells in (22), due to the mentioned neutralization to *-i* in this context:

(22) **Special environment**

	DUAL	**PLURAL**
1	*i*. . .	*i*. . .
12	*i*. . .	*i*. . .
2	*i*. . .	*i*. . .
3	*i*. . .	*i*. . .

Noyer needs three further rules to capture this (23). All three are implicitly

assumed to apply only in the special environment. (23a) deletes [-pl] so that dual ([-sg -pl]) is reduced to [-sg]. (23b) is characterized by Noyer as a "persistent redundancy rule" which inserts the unmarked value (w.r.t [-sg]) of [+/-pl] whenever this is unspecified. (23c) finally deletes all instances of [+/-sg]. (24) shows the derivation of a special environment 2nd person dual form, which is in effect transformed from dual to plural:

(23) **Special rules**

a. [-pl] → ∅
b. [-sg] → [+pl]
c. [αsg] → ∅

(24) **Derivation for 2nd dual form**

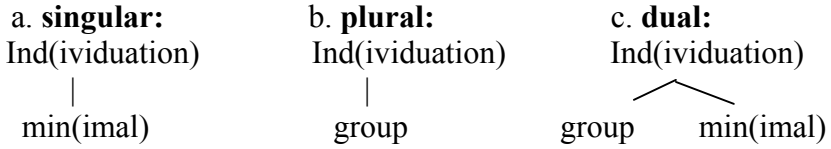
[-sg -pl]
[-sg]
[-sg +pl]
[+pl] ⇒ ***-i:*** [+pl]

Noyer's analysis involves several problems: First, it requires a feature-inserting rule ([-sg] → [+pl]). Second, he needs three different rules to account for a single neutralization process (neutralization to *-i* in the special environment). Finally, the feature system he assumes is highly implausible since it represents dual which is typologically marked w.r.t. singular and plural (Greenberg 1963; Corbett, 2000) as the unmarked number category ([-sg -pl]). In the following section, I will replace this feature system by the well-motivated feature-geometric approach of Harley and Ritter (2002). Based on this system, I show that a more economic analysis of the Nimboran data is possible which dispenses with feature insertion and is fully compatible with Minimalist DM.

5 A minimalist analysis of the Nimboran data

Harley and Ritter (2002) represent number features by feature-geometric structures instead of unordered bundles of binary features. (25) shows the tree representations they assume for singular, plural and dual:

(25)



"Individuation" is the node which dominates all number features. "group" denotes a group with a cardinality greater than 1, and "minimal" the minimal number consistent with the remaining features, hence normally one. From the combination of "group" and "minimal", we get naturally the interpretation "dual" since two is the size of a minimal group.

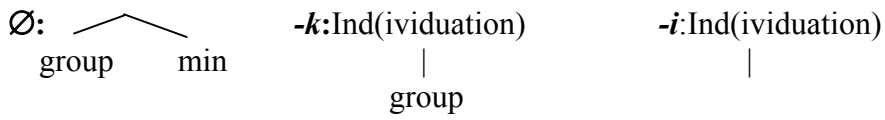
These representations are justified by a big number of crosslinguistical observations. For example, the Greenbergian universal that a language will not have a dual if it does not have a plural number (Greenberg, 1963) follows from the fact

that the configuration for dual is composed from the features characteristic for plural and singular. In contrast to Noyer's feature system, dual is formally the most complex number category. Apart from the structures in (25), the geometry allows one further structure, the configuration in (26) with a bare individuation node:

(26) **???**
Ind(ividuation)
|

Harley and Ritter (2002) argue that this configuration is semantically interpreted by default as singular (i.e., equivalent to (25a)). But this is a statement about the semantic interface (LF). At morphological spellout there are still four different possible configurations for the number node. Thus, a head which is singular (25a) in the syntax might arrive at morphological spellout in this form or in the impoverished shape of (26) leading potentially to different VIs. In the following analysis of Nimboran, I will exploit the possibility of this fourth configuration to capture number neutralization without feature insertion.[6] (27) shows the VIs which account for most of the data in the normal environment:[7]

(27) a. b. c.



-i corresponds straightforwardly to plural, and *-k* to the bare individuation node (26). That ∅ is inserted before *-i* into dual heads (and consequently deletes the group feature which could trigger *-i*) follows from the Elsewhere Principle. The zero VI in (27a) ensures that "group" and "min" of plural heads are completely deleted such that *-k* can be inserted in the next step. Crucially, I assume that a vocabulary item *V* cannot be inserted into a node N_1 which dominates another node N_0 unless *V* also consumes N_0. Thus the VI for *-k* cannot be inserted into any of the basic configurations in (25), and is only possible in the dual if the specific number features have been deleted by (27a).

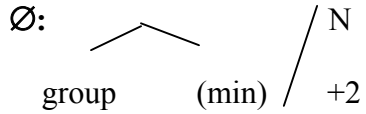
The VIs in (27) account for the distribution in all paradigm cells of the normal environment apart from the second person plural forms, where *-i* should be inser-

[6] See also Vinka (2001) for a treatment of related data in Saami. In Trommer (2001), I give an analysis of the Nimboran data based on a slightly different feature geometry.

[7] Recall that also in Noyer's approach an additional mechanism is necessary in addition to the VIs for *–i* and *–k* to ensure that *–i* has preference over –k in plural forms. Thus both analyses are roughly of the same complexity at this point.

ted just as in the other plural forms. The neutralization to *-k* in 2nd person forms is captured by the VI in (28) which deletes “group” (and “min”, if present) in the context of 2nd person (+2) and normal environment ("N"): For all 2nd person nonsingular forms, a bare individuation node results which triggers insertion of *-k*.

(28)



(29) shows the derivation of 1st and 3rd person dual and plural forms in the normal environment, and (30) the corresponding derivations for 2nd person forms:

(29) **Derivation of 1st/3rd person forms in the normal environment**

Ind | group	———		***-i*:**	———
Ind group min	———	**Ind**	———	***-k*:**
	∅: N group (min) +2	∅: group min	***-i*:**Ind | group	***-k*:**Ind |

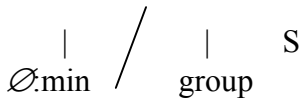
(30) **Derivation of 2nd person forms in the normal environment**

Ind | group	**Ind**	———	———	***-k*:**
Ind group min	**Ind**	———	———	***-k*:**
	∅: N group (min) +2	∅: group min	***-i*:**Ind | group	***-k*:**Ind |

The VIs introduced so far also account for all plural forms in the special environ-

ment. (28) does not apply in this context. Thus (27a) applies to all plural forms (including the second person form) and leads to subsequent insertion of *-i*. Hence, the only data which still have to be accounted for are the dual forms in the special environment for which we expect *-k* just as in the corresponding forms of the normal environment. This is achieved by the zero VI in (31) which deletes the feature "minimal" in the special environment ("S") and thus neutralizes dual to the plural configuration which leads again to insertion of *–i*:

(31)



(32) shows the derivation of all forms in the special environment. The VI in (28) which is restricted to the normal environment is omitted here.

(31) **Derivation of forms in the special environment**

Ind | group	———	———	***-i:***	———
Ind group min	**Ind** | **group**	———	***-i:***	———
	| S **∅:**min group	**∅:** group min	***-i*:**Ind | group	***-k*:**Ind |

In contrast to Noyer's three rules, neutralization to *–i* in the special environment is now captured by just one VI. Since for the rest of the analysis the VIs I assume correspond roughly to the VIs and rules of Noyer[8], the minimalist analysis is more parsimonious than the one using Impoverishment and feature insertion.

6 Double neutralization and restrictiveness

Double Neutralization[9] as in Nimboran, where plural is neutralized to dual in some contexts, and dual to plural in others, seems to be crosslinguistically rare. Thus, a formal account should restrict it to the cases where it actually occurs. While it is possible in MDM in a three-number system (singular/plural/dual), it is excluded in more common singular-plural systems. To see this, assume a (by assumption impossible) singular-plural language which has different VIs for

[8] Cf. also footnote 7.

[9] See also Trommer (to appear) for a similar case of double neutralization in Hungarian.

singular and plural, and two neutralization processes which neutralize singular to plural in some contexts and plural to singular in others. If the singular VI is represented by the feature "minimal" as in (33), none of these neutralizations is possible in MDM since both require feature insertion:

(33)
Ind		Ind	Ind		Ind	
|	* ⇒	|	|	* ⇒	|	
group		min	min		group	

Neutralization of plural to singular is possible in a system where singular corresponds to a bare individuation head[10], but not neutralization in the opposite direction:

(34)
Ind		Ind	Ind		Ind	
|	⇒	|	|	* ⇒	|	
group			group			

Thus, Minimalist DM while allowing for the attested case of double neutralization in Nimboran, does not extend to seemingly unattested cases of double neutralization in singular/plural systems.

7 Summary

In this paper, I have shown that the reduction of most postsyntactic operations to one generalized transformation combining deletion of morphosyntactic features and insertion of phonological features is technically viable, and leads generally to simpler analyses. The data from Nimboran number agreement which have been used as counterevidence against the claim that all spellout operations are feature-deleting have been shown to be fully compatible with this approach.

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[10] See Ortmann (2002) for a crosslinguistic survey of cases where plural neutralizes to singular.

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