The feature structure of pronouns: a probe into multidimensional paradigms*

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Abstract

This paper examines multidimensional paradigms, i.e. paradigms involving more than one feature dimension. I examine the concrete case of pronominal paradigms, which involve (at least) the dimensions of person and number. The problem that arises in such paradigms is that syncretisms may be observed in each dimension, i.e. they may occur both vertically (cross-person) and horizontally (cross-number). While classical nanosyntax embodies a theory of syncretism that can account for one dimension, it requires an extension to account for syncretisms in the other dimension(s). I discuss two such extensions, one making use of pointers (Caha & Pantcheva 2012), and another in terms of a revision of the Superset Principle (based on Caha 2014). I show that both approaches make subtly different empirical predictions. Most notably, the approach in terms of pointers is able to derive certain ABA-syncretisms. This consideration favours the approach in terms of the revised Superset Principle. On the other hand, the revised Superset Principle faces an empirical problem in the derivation of horizontal (cross-number) syncretism, which requires the introduction of a principle to determine a winner between candidates that are in a tie with respect to the Elsewhere Principle.

1 Introduction

Personal pronoun paradigms are multidimensional, as they involve (at least) the feature dimensions of person and number. Syncretisms in multidimensional paradigms may be horizontal and/or vertical:

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(1)

	sg	pl
1	A	B
2	A	C
3	D	E

	sg	pl
1	A	A
2	B	C
3	D	E

As I demonstrate below, deriving the horizontal or cross-number syncretism is unproblematic given the Superset Principle, but deriving the cross-person or vertical syncretism requires an extension of the theory.

The structure of this paper is as follows: in sections 2 and 3, I lay out some assumptions I shall make concerning the internal structure of the person and number feature complex, respectively. Section 4 examines some attested horizontal and vertical syncretisms and shows how the horizontal ones can be derived and why the vertical ones are problematic. Section 5 examines the solution to this problem in terms of the nanosyntactic mechanism of pointers, showing how they allow the derivation of ABA-patterns. Section 6 discusses another solution in terms of a revision of the Superset Principle. The different predictions these two approaches make are examined in detail in section 7. Section 9 addresses the issue of possible but unattested syncretisms. Finally, section **??** explores some further consequences of the revised Superset Principle.

The empirical evidence on which this paper is based is mostly taken from the typological study by Cysouw (2003). I have nevertheless applied a number of restrictions to this material. Cysouw discusses all kinds of person marking, i.e. both independent pronouns as well as inflectional person markers. I focus exclusively on person marking in independent pronouns. This restriction is made possible by the fact that Cysouw is generally quite explicit on this issue in his description of the data.

It is obvious that verbal agreement morphology also bears on the issue of the internal structure of the person feature complex. Yet at the same time there are some important empirical differences between both systems. As we shall see, syncretisms in the personal pronouns are extremely rare in the singular, almost to the point of being non-existent. The picture in the plural is more complicated, in ways that will become clear as we proceed. Syncretisms in the verbal inflection, on the other hand, are extremely common, both in the singular and the plural (see, for example, the findings by Baerman et al. 2005, Baerman & Brown 2013, Aalberse 2007, Aalberse & Don 2009, Ackema & Neeleman 2013). These studies have found that none of the possible person syncretism patterns is actually unattested in the verbal inflection, though not all of them are equally common. A second empirical difference between pronominal paradigms and inflectional agreement paradigms is that the latter are typically sensitive to feature dimensions lacking in the pronouns, such as tense and verb class, so that there may be several paradigms, each with their own syncretisms, within the same language. Independent pronouns

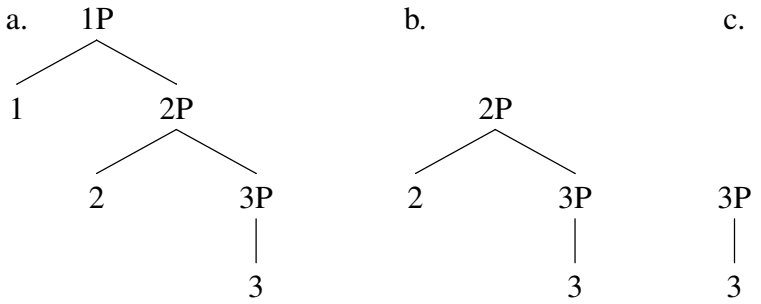
do not display any tense or class sensitivity, and therefore constitute a clearly distinct case. It is clear that a full investigation of the person feature will eventually have to incorporate the verbal inflection, but for now the restriction to independent pronouns seems well-motivated.

Another empirical domain that I shall leave aside in the present paper is the inclusive-exclusive distinction. Inclusive pronouns probably involve a composition of the features of first and second person pronouns, whereas exclusive ones only involve the features that enter into the makeup of the first person. However, since this is not the central topic of this paper, I leave leave this matter aside for now.

2 The person feature complex

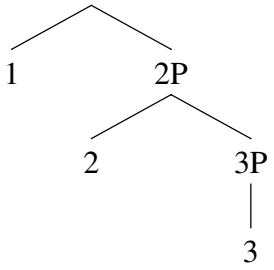
I adopt the proposal put forth by Starke (2013). This proposal assumes that there are three privative features [speaker], [participant], and [person]. The first person personal pronoun has all three of these features, since the first person is the speaker, a participant and a person. The second person pronoun only has participant and person, and the third only person. For expository purposes, I refer to these features by numbers (1 = [speaker], 2 = [participant], and 3 = [person]). The feature trees for the first, second, and third person personal pronouns are given in (2a), (2b), and (2c), respectively:

(2)

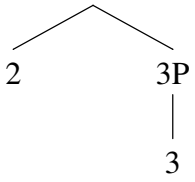


Given these syntactic feature trees, we expect to find syncretisms between 1 and 2 (AAB), 2 and 3 (ABB), and 1, 2, and 3 (AAA), but no syncretism of 1 and 3 across 2 (*ABA). Consider a hypothetical example of an ABB-pattern, i.e. a 2/3 syncretism. This pattern can be shown to result from lexical items as given in (3):

(3) a. </A/, 1P>



b. </B/, 2P>



In a 1P syntactic tree, (3a) will be the only candidate for insertion in virtue of the Superset Principle, since the lexical tree (3b) does not contain the syntactic tree as a subtree (I am assuming here the definition of the Superset Principle as given in Caha 2009:55). In the second person, both lexical items are candidates, but (3b) will win the competition over (3a) in virtue of the Elsewhere Principle, as it contains less superfluous material than (3a). The same is true in the third person: both items are candidates for insertion but (3b) will win as it is a closer match.

3 Number

Before going on to a discussion of the actual syncretism data, we need to say something about the syntactic representation of number. Some languages form the plural of pronouns with the same morpheme that is used with nouns (or certain noun classes). This is illustrated for Mandarin Chinese in (4) (Corbett 2000:76):

(4)

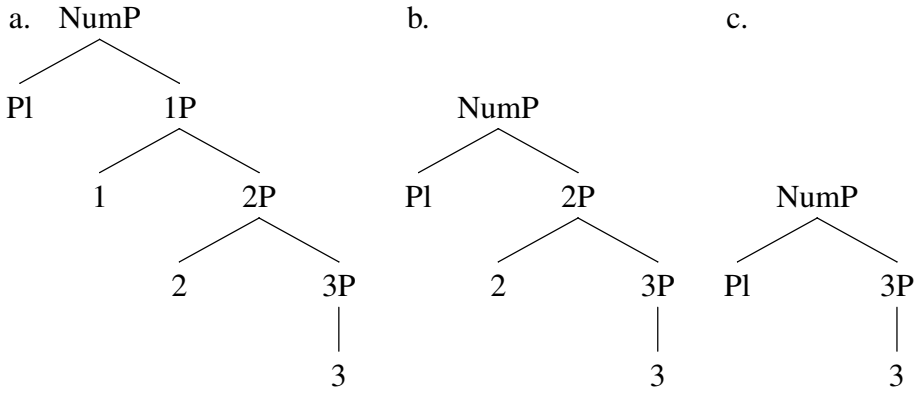
	sg	pl
1P	wǒ	wǒ-men
2P	nǐ	nǐ-men
3P	tā	tā-men

(5) xuésheng xuésheng-men
student student-PL

Other languages displaying this pattern include Sierra Popoluca (Elson 1960), Trumai, Korean, Canela-Kraho, and Miskitu (Cysouw 2003, Corbett 2000; see Daniel 2013 for additional discussion).

Exploiting the analogy illustrated in (5), I conclude that plural number sits on top of the person feature complex, as shown in (6):

(6)



In Mandarin Chinese, a lexical item as in (7) can be assumed, which spells out the plural morpheme:

(7) </men/, NumP >
Pl

Spell-out driven movement ensures that the complement of Pl in (6) moves into the Spec of NumP, after which *-men* spells out NumP. We shall have reason to modify the trees in (6) later, but for now they represent a good initial assumption on the position of the number dimension in the feature hierarchy.

4 Attested syncretisms

4.1 Types of patterns

Having outlined some of the background theoretical assumptions of this paper, we are now in a position to take a closer look at the types of syncretisms that one can observe in the personal pronouns. Basically, three general types of patterns can be distinguished, numbered I-III in (8).

(8)

	I		II		III	
	sg	pl	sg	pl	sg	pl
1	C	A	A	A	A	A
2	D	B	B	C	B	A
3	E	B	D	E	C	D

In the first pattern, one finds vertical, or cross-person, syncretisms. The second type of pattern instantiates horizontal, or cross-number, syncretism. The third type of pattern is a nonlinear one (i.e. cross-person and cross-number). All of these

patterns are attested, and I shall now discuss them in turn, starting out with the horizontal syncretisms, as they are the simplest ones to derive.

4.2 Horizontal syncretisms

The horizontal syncretism can be restricted to a single person, two persons, or arise in all three persons. The following table lists the attested patterns:[1]

(9)

3P	Sinhalese, Sentani, Asmat, SALISH
2P (rare)	English, Xokleng
1P (rare)	Marind
2P and 3P	Berik, Kuman
1P and 3P (rare)	Tairora
all persons	Salt-Yui (3P: demonstratives)

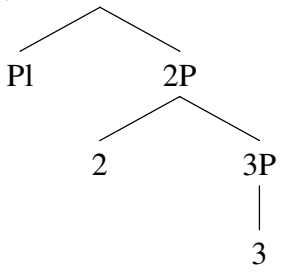
By way of example, consider the case of Berik (New Guinea):

(10)

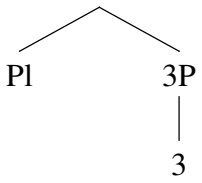
	sg	pl
1P	ai	ne
2P	aame	aame
3P	je	je

The relevant lexical items are given in (11); they assume that plural pronouns are characterised by the presence of a single additional feature as compared with their singular counterparts.

(11) a. </aame/, NumP >



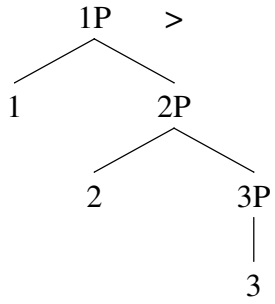
b. </je/, NumP >



The item *aame* (11a) can spell out 2P, both singular and plural, by the Superset Principle: the tree of the singular pronoun is a subtree of the plural pronoun tree.

[1] Small capitals indicate language families rather than individual languages. Quite a number of languages feature no 3P pronouns, but replace them by demonstratives instead. I shall leave it as an open question whether this state of affairs is to be considered an instance of a lexical gap, filled by the demonstratives, or whether we are dealing with a syncretism between third person personal pronouns and demonstratives. The systematic nature of the filling of the gap by demonstratives suggests that the latter interpretation is correct.

For the same reason, (11b) can spell out 3P, both singular and plural. A problem arises, however, when we consider the lexical item for the 1P sg pronoun *ai*:

(12) </ai/, 

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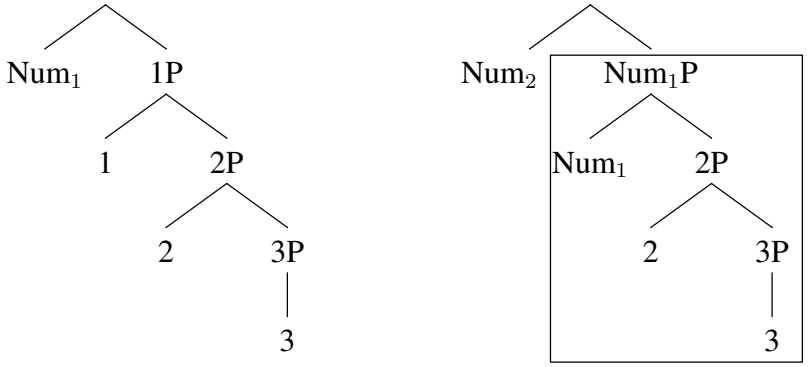
The problem is that in the 2P sg, there is a tie between (11a) and (12): (11a) *aame* and (12) *ai* each contain exactly one feature more than the syntactic node of a 2P sg pronoun. This problem is easily solved by assuming that the number projection is internally complex, i.e. singular number also involves the presence of a number feature (Num_1), plural number involves two features (Num_2 and Num_1).[2]

(13) a. </ai/, Num_1P > b. </aame/, Num_2P >



Now (13b) *aame* can still spell out 2P, both singular and plural: in the plural it is a perfect match, and in the singular the lexical tree contains the syntactic tree as a subtree (highlighted in (13b)). However, (13a) *ai* can no longer spell out the 2P sg, since it does not contain the syntactic tree as a subtree. This solution crucially requires that singular pronouns contain a Num_1 feature: the presence of Num_1 in (13a) prevents the tree from being a match for a 2P syntactic tree. Informally, one

[2]I leave open the question of the precise nature of these number heads. A. Rocquet (p.c.) suggests that the first number head (Num_1), which is always present in the pronouns, could be a layer of 'definiteness' or a 'count' layer, since personal pronouns usually refer to definite/count entities. The number projection is certain to be more complex than suggested here, as it does not make provisions for the well-known property of dual number (Corbett 2000). Since the analysis of the number projection is not the topic of this paper, I shall leave this as an issue for further research.

can describe this as an impossibility of a lexical tree to 'shrink' in the middle to match a syntactic tree. While trees can 'shrink' at the top to match a syntactic tree, they cannot shrink in the middle. The other attested patterns of horizontal syncretism work in the same way, and can be derived in the same way.

Summarizing, the horizontal syncretisms support the claim that singular number is not the absence of number, but the presence of a singular number feature. The existence of horizontal syncretisms further rests on the possibility to build trees with an incomplete person f_{seq}, i.e. with person features missing at the top of the person sequence, as well as the possibility of 'shrinking' the number projection at the top of the tree, as allowed by the Superset Principle.[3]

4.3 Vertical syncretisms

Cross-person syncretisms in the singular pronouns are extremely rare: Cysouw (2003) finds only two languages (out of the 90 for which independent pronoun paradigms are listed) showing ABB or AAB, Qawesqar and Winnebago.[4] Vertical or cross-person syncretisms do occur in the plural, however. Some languages that display them are listed below:

(14) a. AAB: many Athabascan languages (e.g. Slave, Chiricahua Apache, Navaho, Kato, Hupa), Awa, Southern Haitian Creole
b. ABB: Nez Perce, Warekena, Wolof (object pronouns), Mauritian Creole[5]

The account of the AAB and ABB syncretisms is not straightforward. Consider the AAB-pattern in Slave (Cysouw 2003:124):

(15)

	sg	pl
1P	si̯	naxi̯
2P	ni̯	naxi̯
3P	ʔedi̯	ʔegedi̯

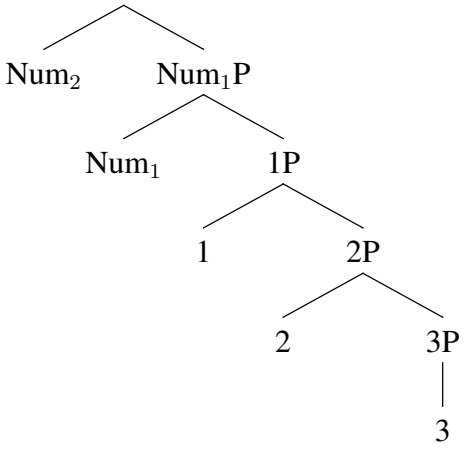
The lexical tree for the 1P plural pronoun is given in (16):

[3]The metaphor of tree shrinking used here is unrelated to the concept of impoverishment in DM. Rather, it refers to the fact that a lexical tree may map onto a syntactic tree that is smaller, i.e. the lexical tree may be overspecified in comparison with the syntactic tree.

[4]Concerning Qawasqar, M. Cysouw (p.c.) informs me that work by Oscar Aguilera reveals that the data in Clairis (1985) are probably not entirely reliable, and that Qawasqar has different forms for 1P and 2P sg, and either a null pronoun or a demonstrative in 3P sg. A language not mentioned by Cysouw is Sanapaná (Gomes 2013), which has an ABB pattern both in the singular and the plural.

[5]According to Baker (1972) and Stein (1984), but not Adone (1994), who gives an ABC-pattern in the plural.

(16) </naxi̯/, Num_2P >



This can spell out the syntactic tree of a 1P pl pronoun, but not of a 2P pl one, since the latter lacks the 1P node and is therefore not a subtree of (16). To derive the AAB-pattern, the tree would have to be able to shrink in the middle (from 1P to 2P). For the same reason, the ABB-pattern cannot be derived either, as the lexical item for 2P cannot shrink to 3P.

A solution to the problem of the existence of both horizontal and vertical syncretisms in multidimensional paradigms has been proposed by Caha & Pantcheva (2012), which relies on the mechanism of pointers. More recently, Caha (2014) has proposed a reformulation of the Superset Principle, which can be applied to the problem of multidimensional paradigms as well. I shall now discuss these two solutions in turn.

5 Pointers

5.1 Suppletion

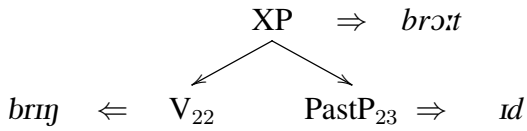
A pointer is a node in the tree of a lexical item that points to another, existing, lexical item (Starke 2011). Starke proposes pointers as a mechanism to account for cases of suppletion.[6] For example, the lexical item of the suppletive past tense *brought* contains a pointer to the lexical items for *bring* on the one hand, and the past tense morpheme on the other.

(17) a. $<_{24}$ /brɔːt/, $[_{XP}$ 22 23]>
b. $<_{22}$ /briŋ/, V>
c. $<_{23}$ /ɪd/, PastP>

[6]Starke (2014) presents a slightly different take on suppletion, but not one that has different effects, as far as I can tell.

Informally, the pointer may be represented in a tree using an arrow instead of a plain branch:

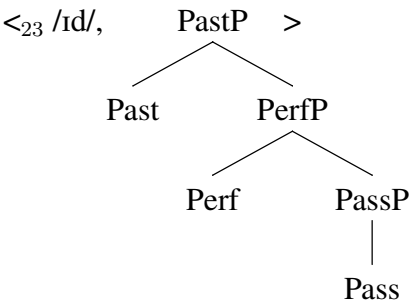
(18)



Each of the lexical items pointed to is subject to independent cyclic spellout. This creates *bring+ed*, which is overwritten at the top node by *brought*, but only in case the nodes dominated by XP have previously been spelled out by *bring* and *-ed*, respectively, since we do not want *brought* to spell out the combination of *walk+ed* (or any other verb, for that matter). Given the syncretism between Past-Perfect-Passive illustrated in (19), we must conclude that *-ed* has more internal structure, so that instead of (17c), we have (20):

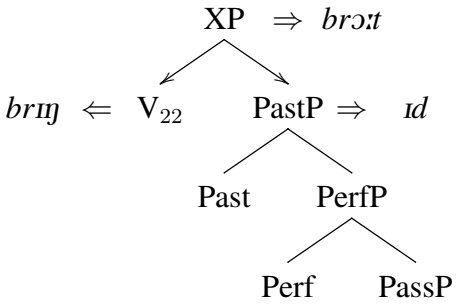
(19) a. They elected George.
b. They have elected George.
c. George was elected.

(20)



The *-ed* suffix can spell out a past tense, a perfect, or a passive syntactic tree: this is because the lexical tree can shrink at the top, due to the Superset Principle. Now the suppletive form *brought* shows the same Past-Perfect-Passive syncretism. This means that in the item with the pointer (19), the item pointed to (20) must be also allowed to shrink to any subtree.

(21)

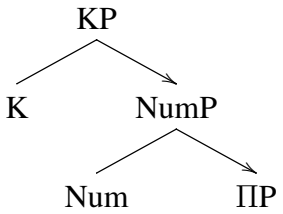


That is, the shrinking that can only take place at the top in (20) can also take place in the middle of the tree in (21). The substructure dominated by the pointer defines its own superset domain for purposes of lexicalization candidacy. This is a natural consequence of the mechanism of cyclic spellout: the item pointed to is an independent lexical item and can shrink at the top, even if it is contained in a larger lexical tree in virtue of the pointer relationship. As a result, the lexical item *brought* can spell out three different syntactic trees, just like the suffix *-ed* can.

5.2 Multidimensional paradigms

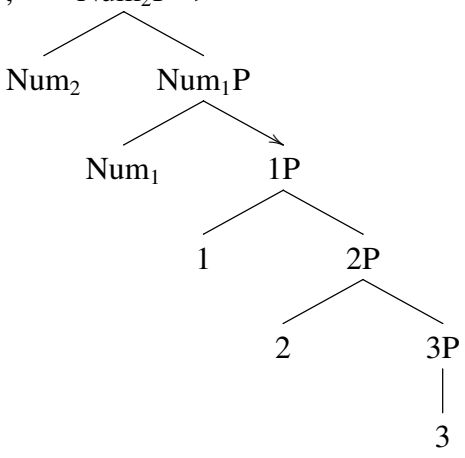
Let us return now to the vertical syncretisms in the pronoun paradigms in the plural. As we saw above, pronouns spell out multiple feature dimensions: Case, number, person, and gender. Let us assume that the lexical items for pronouns can also contain pointers at the juncture of the dimensions (in the tree below, KP represents the Case sequence, NumP the number sequence, and ΠP the person sequence):

(22)



This assumption allows the derivation of the problematic vertical syncretisms, since the tree can now shrink in the middle (from 1P to 2P to 3P). Recall the lexical tree for the Slave pronoun *naxi̯*, syncretic for 1P pl and 2P pl (see (16) above). We now add a pointer to this tree:

(23) </naxi̯/, Num_2P >



This representation allows us to derive the AAB-pattern. The lexical item in (23) can spell out a 1P pl pronoun, but also a 2P pl one, because of the presence of the pointer. The lexical item for the 3P pl pronoun *ʔegedi̯* does not contain the 1P and 2P projection. As a result, it will win the competiton from (23) in the 3P pl because of the Elsewhere Principle.

In a similar fashion, vertical ABB syncretisms can be derived. Assume a lexical item like (22) but without a pointer. This is the A-pronoun, which can only spell out 1P pl, since it does not contain a pointer. In addition, assume a B-pronoun like (22) (with a pointer) but without the 1P node. This B-pronoun does not compete with the A-pronoun in the 1P, since it lacks the 1P node. The B-pronoun contains a pointer and can spell out both 2P pl and 3P pl.

5.3 Pointers introduce ABA

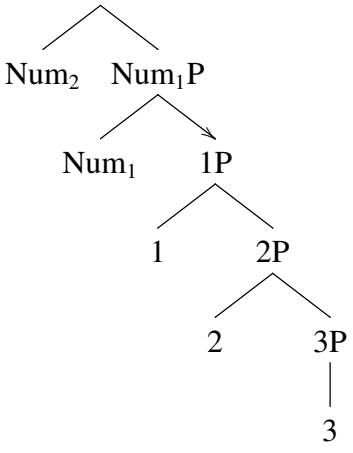
Allowing pointers also allows a certain type of ABA-pattern in the plural, in agreement with an abstract prediction made by Taraldsen (2012).

(24)

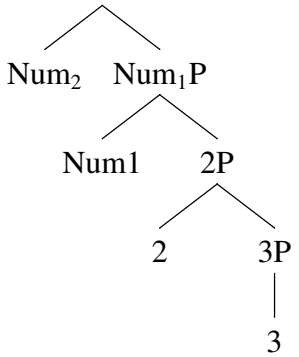
	sg	pl
1P	C	A
2P	D	B
3P	E	A

Let us see how the derivation of this pattern follows from the system outlined above. For A, assume a lexical entry with a pointer, as in (25a), which is flexible at the number-person joint: due to the shrinkability of items with pointers, the lexical item A can spell out all the plural pronouns. The lexical item for B, given in (25b), does not contain a pointer, and is therefore rigid (i.e. not shrinkable in the middle).

(25) a. </A/, Num_2P>



b. </B/, Num_2P>



If the syntactic tree is 3P plural, (25a) A is the only candidate, since (25b) cannot shrink in the middle to spell out 3P pl. If the syntactic tree is 2P plural, B wins the competition from A, even though their trees are identical (modulo the shrinking of (25a) at the juncture), because of the Elsewhere Principle. This is because the lexical item (24b), without the pointer, applies in a proper subset of the environments of the lexical item (25a), with the pointer: (25a) can shrink both at the top and in the middle and therefore applies to 9 structures, whereas (25b) can only shrink at the top and applies to only 4 structures. If the syntactic tree is 1P plural, B is not a competitor since it lacks a 1P node; A can (and does) spell out the tree. These findings agree with an abstract prediction made by Taraldsen (2012), who argues that ABA-patterns may arise in multidimensional paradigms, given Caha & Pantcheva's analysis in terms of pointers.

In sum, we have seen that vertical syncretisms in the pronouns can be derived by means of assuming the presence of pointers in lexical representations. But assuming pointers opens the door to ABA-patterns. Given the central role that syncretisms play in establishing feature hierarchies, this is a potentially rather undesirable conclusion.[7] I now therefore turn to another solution, which involves a revision of the Superset Principle, and which does not allow the derivation of ABA-patterns.

6 Reformulating the Superset Principle

In this section, I investigate a different way of analysing multidimensional paradigms, which will allow us to capture both horizontal and vertical syncretisms in multidimensional paradigms, but which at the same time does not make ABA

[7]It is an open question whether ABA is actually attested in the independent pronouns. I am aware of two claims in the literature to that effect. Baerman et al. (2005) quote the case of Dakar Wolof (Nussbaum et al. 1970) as an example of a language with a 1/3 syncretism in the independent pronouns. However, this case is moot. Stewart & Gage (1970:38) give the following paradigm for the Dakar Wolof independent pronouns, which does not show the 1/3 syncretism:

(i)

	sg	pl
1	man	ñum
2	yow	yeen
3	moon	ñoom

There is, to be fair, a 1/3 syncretism in the plural of the so-called dependent pronouns, but these behave more like clitics than like independent pronouns, to the point where one could wonder if they had not better be analysed as inflectional markers. The second case involves Bagirmi, a Nilo-Saharan language spoken in Chad (Gaden 1909), which Cysouw (2003) claims has an ABA-pattern in the plural pronouns. This does, however, appear to be an isolated case, from a relatively undocumented language. Since a detailed study of these pronominal systems is beyond the scope of the present article, I shall leave them as a matter for future research.

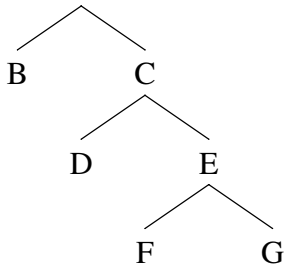
derivable. It relies on a reformulation of the Superset Principle, which is inspired by (but not identical to) a proposal made by Caha (2014). It is given in (26):

(26) *Revised Superset Principle (RSP)*
A lexical entry L may spell out a syntactic node SN iff the features of L are a superset of the features dominated by SN.

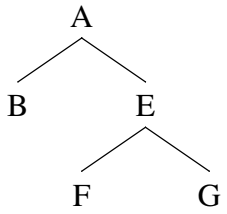
As we saw earlier, vertical syncretisms require the 'shrinking in the middle' of the lexical tree. Consider the following abstract example, where (27a) is a lexical item and (27b) the syntactic tree:

(27)

a. </α/, A >



b.



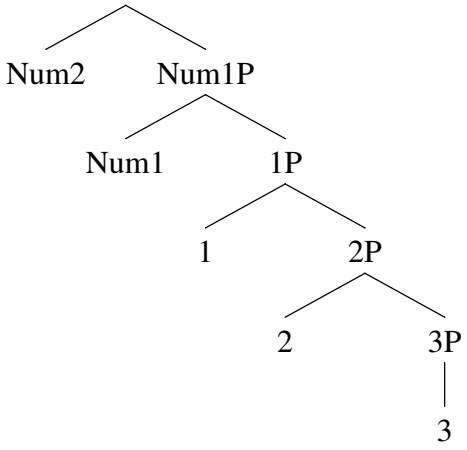
The RSP makes (27a) a possible spellout for the syntactic tree (27b), even though the syntactic tree misses the C and D nodes that occur in the middle of the lexical tree. All the RSP requires is that the features of the lexical item (which are {B, D, F, G}) be a superset of the features of the syntactic tree (which are {B, F, G}. This condition is obviously met in (27). Put more informally, the lexical tree can 'shrink' in the middle to become identical to the syntactic tree.

The RSP derives both horizontal and vertical syncretisms in multidimensional paradigms without the need for pointers, and at the same time makes ABA-patterns underivable. To see how this works, reconsider the AAB-pattern in Slave, with the lexical tree for the 1P plural pronoun given in (29):

(28)

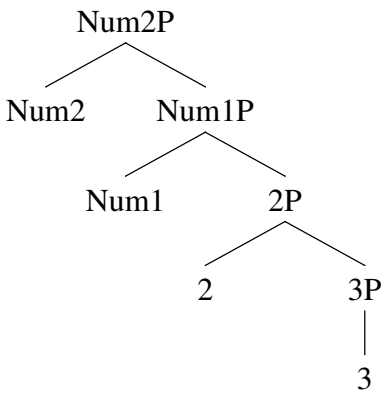
	sg	pl
1P	si̯	naxi̯
2P	ni̯	naxi̯
3P	ʔedi̯	ʔegedi̯

(29) </naxi̯/, Num2P >



The lexical item (29) will be able to spell out a syntactic tree for 1P pl, as both trees are fully identical. What we need to show is that (29) can also spell out the syntactic tree for 2P pl, given the RSP. The relevant syntactic tree is given in (30):

(30)



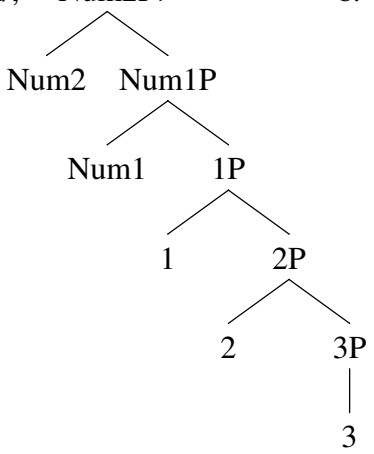
The lexical item (29) can spell out the syntactic tree (30), given that its features are a superset of those of the syntactic tree. Note that the lexical tree does not contain the syntactic tree as a subtree: in this example, the node 1P of the lexical tree is not found in the syntactic tree. While this situation is ruled out by the classical Superset Principle, it is allowed by the RSP.

The RSP does not allow the derivation of ABA-patterns. Recall the ABA-pattern discussed above, and the corresponding lexical items in (32) (but now without a pointer).

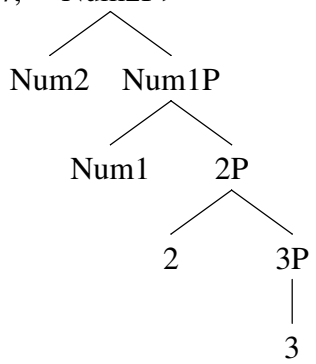
(31)

	sg	pl
1P	C	A
2P	D	B
3P	E	A

(32) a. </A/, Num2P>



b. </B/, Num2P>



Given the RSP, both A and B can shrink in the middle, i.e. both can now spell out 2P and 3P. As a result, both lexical items will compete in 2P pl and 3P pl. The Elsewhere Principle now ensures that B will win the competition both in the 2P pl and the 3P pl. As a result, *ABA holds in full generality, i.e. ABA-patterns are underivable in principle. I return to some further ramifications of the RSP in section **??** below.

In sum, both the approach in terms of pointers and the RSP allow the derivation of multidimensional paradigms. However, the pointers approach opens the door to the derivation of ABA-patterns. The RSP is more restrictive and does not allow the derivation of ABA-patterns. In what follows, I investigate a series of nonlinear syncretisms, showing where both approaches make different predictions.

7 Nonlinear syncretisms

7.1 Shapes and sizes

In this section, I discuss syncretisms which are not exclusively horizontal, and not exclusively vertical either. These come in a variety of shapes and sizes, which are summed up in (33):

(33) a. L-shaped, contiguous
b. double L, without ABA
c. diagonal (non-contiguous)

d. L-shaped, with ABA
e. double L, with ABA

The interest of the discussion is that the two approaches for dealing with multidimensional paradigms outlined above make different predictions as to the possible existence of these patterns. In what follows, attested patterns are illustrated by an example, and unattested patterns by an abstract representation of the syncretism type in terms of capital letters.

7.2 L-shaped, contiguous

There are basically four different logically possible L-shapes, only one of which is attested. This is the type of L that is found in Usarufa (Cysouw 2003):

(34)

	sg	pl
1P	ke	ke
2P	e	ke
3P	we	ye

This syncretism is derivable under the pointers approach: the 1P lexical item *ke* contains a pointer, which means that it can spell out all persons and numbers. However, *ke* loses the competition to more specific lexical items without pointers (*e, we, ye*).

The pattern is also derivable with the RSP: here too, *ke* can spell out all persons and numbers. In 2P sg, *ke* loses the competition to the more specific lexical item *e*, which lacks the 1P node. In 2P pl, *ke* is the only candidate, because *e* lacks the plural number node, and *we* and *ye* lack the 2P node. In 3P, *we* and *ye* win against all the other items because they lack the 2P and 1P nodes.

The second type of L is one that is a mirror symmetry of the first one:

(35)

	sg	pl
1P	A	A
2P	A	B
3P	C	D

This pattern is also derivable under the pointers approach: the A-item can spell out all persons and numbers because it can spell out 1P pl and because it contains a pointer. It will lose against the more specific B, C, and D items where these occur because these do not contain a pointer. In the RSP approach, however, this pattern is underivable. The A-item is maximal and can spell out all persons and numbers. The B-item can spell out anything that is nonfirst person. As a result, the Elsewhere Principle will yield a win of the B-item over the A-item in 2P,

both in the singular and the plural, and this makes the pattern in (35) effectively underivable.

Both of these patterns have a variant where the L-shape is one row lower in the paradigm. Our conclusions on (34) and (35) extend directly to these variants, so that we shall not discuss them in detail here.

Two other types of L-shaped patterns involve a 180° rotation of the two previous patterns:

(36)

	sg	pl	sg	pl
1P	A	B	B	A
2P	A	A	A	A
3P	C	D	C	D

These are both derivable under the pointers approach, for essentially the same reason as above: A can spell out all persons and numbers and contains a pointer, but loses against B, C and D where these occur because they do not contain pointers. Neither pattern is derivable under the RSP approach, however. The left hand one has an A-item that can spell out all persons and numbers since it can spell out 1P and plural number. But the B-item can do so, too, as it spells out 1P pl. As a result, there will be a tie between A and B in all cells of the paradigm that are nonthird person. The paradigm on the right of (36) is underivable because A cannot win against B in 2P sg, as B is more specific in never occurring in the plural. The same conclusions hold for the variants of these patterns where the L is one row lower in the paradigm.

In sum, of the four logically possible L-shapes (excluding their variants), only one is actually attested. This is also the only one derivable under the RSP, whereas all four types are derivable under the pointers approach. The RSP approach therefore provides a much better fit with the data here than the pointers approach.

7.3 Double L, without ABA

This abstract pattern is illustrated in (37) and (38):

(37)

	sg	pl
1	A	A
2	B	A
3	B	B

(38)

	sg	pl
1	A	A
2	A	B
3	B	B

Neither of these patterns is derivable under the pointers approach. The reason is that there are two competing items, which both contain pointers. The A-item is maximal and flexible, and can express all persons and numbers. The B-item is more specific, since it does not contain a 1P projection, but it is also flexible, and can apply to both 2P and 3P and to both singular and plural. This will ensure a win of A in the first person, but also a win of B in all the other persons. In particular, in the second person the B-item will win both in the singular and in the plural, because the A-item applies to more cases than the B-item.

The same reasoning applies to the approach in terms of the RSP. Since B can express both sg and pl number, it will win against A both in the singular and in the plural.

7.4 Diagonal

Diagonal syncretisms contradict spatial accounts of syncretism (e.g. McCreight & Chvany 1991). As we shall see, there are quite a number of logically possible types of diagonal syncretisms, but only one of these types is attested. This is the pattern illustrated by the following example from Suki:

(39)

	sg	pl
1P	ne	e
2P	e	de
3P	u	i

This pattern is derivable under the pointers approach. The lexical tree of the *e*-pronoun is maximal and flexible, i.e. shrinkable at the joint (from 1P to 2P). As a result, *e* can express all the persons and numbers, but it loses the competition to the rigid items for the other persons and numbers since they contain less superfluous material.

Diagonal syncretisms of this type are underivable with the RSP. Here too, the lexical item *e* can spell out all persons and all numbers. In 2P sg, there are two more specific items, however: *ne* (because it cannot spell out plural) and *de* (because it cannot spell out first person). We now have three candidates for spellout, of which *e* is the one with most superfluous structure; we therefore do not predict *e* in this position in the paradigm.

Now look at another type of diagonal, which is minimally different from (39), but which is unattested:

(40)

	sg	pl
1P	A	B
2P	C	A
3P	D	E

This type of diagonal is not derivable with pointers nor with the RSP. Both the A and the B-item can spell out all numbers and all persons: B because it spells out the maximal tree of 1P pl, and can consequently spell out any smaller tree. Likewise A can spell out any person or number, as it can spell out 1P (the maximal person) as well as plural (the maximal number). As a result, the lexical trees of A and B are identical (except for the presence of a pointer in A under the pointers approach). This results in a tie between A and B in 1P (sg and pl), and in 2P pl, as both A and B contain the same amount of superfluous material. I take this to be an inadmissible situation in the domain of pronouns.

Two other types of diagonal patterns are also unattested:

(41)

	sg	pl	sg	pl
1	B	C	B	C
2	D	A	A	D
3	A	E	E	A

Only the left hand one is derivable with pointers; the RSP allows the derivation of neither of these patterns. The two diagonals in (41) have basically the same shape as the first two in this section, and the same reasoning applies.

A combination of both diagonals yields the double diagonal patterns in (42), both unattested; the right hand one is derivable with pointers, whereas the RSP allows the derivation of neither of these:

(42)

	sg	pl	sg	pl
1	A	B	B	A
2	C	A	A	C
3	A	D	D	A

Summarizing so far, there are six types of diagonal syncretisms allowed by the pointers approach, only one of which is actually attested, and derivable with pointers. All types of diagonals are ruled out by the RSP.

We now proceed with a discussion of some further types of diagonals, which combine the diagonal with an L-shaped syncretism. These syncretisms are underivable under either approach. An overview of the possible patterns is given in (43):

(43)

	sg	pl	sg	pl	sg	pl	sg	pl
1P	C	A	A	C	B	B	B	B
2P	A	B	B	A	B	A	A	B
3P	B	B	B	B	A	C	C	A

These are underivable with pointers because both A and B contain a pointer. The problem arises in the rows where A competes with B in the same row: either B

wins the competition both in the singular and the plural (as in the two patterns on the left), or A wins both in the singular and the plural (as in the two patterns on the right). The patterns are also underivable with the RSP, as are all patterns involving diagonals.

There are some further logically possible diagonal syncretisms, which combine a diagonal syncretism with an ABA pattern, as illustrated in (44):

(44)

	sg	pl
1	C	A
2	D	B
3	B	A

This is not derivable under the pointers approach, again because both A and B must be assumed to contain pointers, both the vertical and the diagonal syncretism requiring pointers, as explained above. As a result, B will win against A in the 3P pl. Neither are syncretisms with ABA derivable under the RSP, for the reasons explained above. There are more logically possible patterns which combine a diagonal (or a double diagonal as in (42)) with an ABA (or a double ABA), but since they are all underivable we shall not discuss them any further here.

7.5 L-shaped, with ABA

An L-shaped syncretism with ABA would be one instantiating the abstract pattern in (45):

(45)

	sg	pl
1	A	A
2	C	B
3	D	A

The syncretism is derivable in the pointers approach: the A-item is maximal and flexible, and it loses out to the more specific C-B-D items where the latter occur. The pattern is underivable with the RSP, as are all cases involving ABA, for the reasons outlined earlier.

7.6 Double L, with ABA

One instance of this abstract pattern is illustrated in (46):

(46)

	sg	pl
1	A	A
2	B	B
3	B	A

This is not derivable under the pointers approach for the same reason as the other double L patterns discussed above: there are two competing items, both containing pointers, with the tree for B smaller (and therefore more specific) than the tree for A. This will ensure a win for A in 1P, as required. The problematic cell is 3P pl, where B is expected to win against A since its tree is smaller than the tree of A. The pattern is also underivable under the approach in terms of the RSP, since it involves an ABA pattern in the plural.

7.7 Summary of findings

Summarizing our findings so far, we can say that both the approach in terms of pointers and the one in terms of the Revised Superset Principle face some empirical problems. The RSP approach is more restrictive in general, but perhaps too strongly so, in that it rules out the existence of a pattern which is actually attested. This is the diagonal pattern found in Suki. According to Cysouw (2003:121), this pattern is 'commonly found in the contemporary Aztecan languages', although the evidence he quotes involves subject prefixes rather than independent pronouns. On the other hand, the pointers approach is perhaps too liberal, in that it allows far more syncretisms than are actually attested. The situation can be represented in a subset-superset subset hierarchy, where neither the approach in terms of the RSP nor the one in terms of pointers provides an exact match with the attested data.

(47) logically possible $\supset$ derivable with pointers $\supset$ attested $\supset$ derivable with RSP

On conceptual grounds, the approach in terms of the RSP seems preferable, as it rules out all cases of ABA, and it therefore leaves the syncretism diagnostic, a cornerstone of the nanosyntactic method, fully intact. At the same time, it remains an empirical question whether in certain cases ABA-patterns are attested or not. The empirical domain investigated here is that of the independent pronouns, where they are indeed vanishingly rare, but in the domain of verb agreement the existence of 1-3 syncretisms is uncontroversial (see e.g. Ackema & Neeleman 2013). Note further that even under the pointers approach, ABA-patterns could not arise in the dimension that is structurally highest. In the nominal domain, this is arguably the Case dimension. Even if a lexical item could contain a pointer in the Case sequence, this would not lead to any ABA-patterns in the Case dimension. It would only create the possibility for spelling out sequences that the syntax cannot

create, assuming there to be no gaps in the functional sequence for Case. The possibility of ABA is only created in dimensions that sit lower in the hierarchy than Case, such as number and person.

8 A Further Consequence

In this section, I would like to discuss a problem for the RSP. The problem concerns horizontal syncretisms in the nonfirst person. The abstract pattern is given in (48):

(48)

	sg	pl
1P	A	B
2P	C	C
3P	D	E

Here, both the lexical items A and C are candidates for spelling out a 2P sg syntactic tree, but the Elsewhere Principle does not designate either one as a winner. C can spell out 2P sg because it can spell out 2P pl, i.e. it contains exactly one more feature than the syntactic tree. The same is true for A: assuming either pointers or the RSP, A can spell out 1P sg and therefore also 2P sg; like C, the lexical item for A contains exactly one feature more than the syntactic tree. Since A and C contain an equal amount of superfluous material, the Elsewhere Principle cannot determine a winner, an unwelcome result. This is in fact a problem that we encountered earlier (in connection with the horizontal syncretism of Berik discussed in section (9) above), and that we solved by assuming that singular number involved a separate number feature, rather than the absence of number. This solution worked as long as we only considered horizontal syncretisms, i.e. trees that only could shrink at the top. But now that we have introduced mechanisms that allow trees to shrink in the middle as well, the problem reappears. In the pointers approach, there is an easy way to solve it: the only assumption needed is that A contains no pointer, and therefore is no candidate for spelling out 2P sg. C only has to shrink at the top and will therefore spell out 2P sg. In the RSP, however, an additional assumption needs to be made to ensure that C is the winner. This follows from the fact that the RSP gives up the subtree requirement that is present in the classical Superset Principle, and only looks at the features. Since C and A both have exactly one feature more than the syntactic tree, they are both candidates, and both contain exactly the same amount of superfluous material. A solution consists in claiming that the Elsewhere Principle must be supplemented with the following principle:

(49) Prefer spellouts where the mismatch between the lexical tree and the syn-

tactic tree is restricted to the top of the tree.

An informal version of this principle could be formulated as 'Prefer High Junk', or 'Minimize Gaps'. This will ensure a win of C over A in 2P sg: C only differs from the syntactic tree at the top, whereas A differs from it in the middle. In sum, in order to derive horizontal syncretisms, the RSP needs to be supplemented with the principle in (49).

9 Possible but unattested syncretisms

In this section, I want to address a rather striking case of a possible but virtually unattested syncretism, which is the vertical syncretism in the singular. It turns out that in the domain of case as well, syncretisms are unevenly distributed. Baerman et al. (2005:44) observe that case syncretisms are sensitive to an animacy hierarchy, given in (50):

(50) 1sg > 2sg > 1incl du > 1incl pl > 2du > 2pl > 3 > this > that > indefinite > animate > *meat, vegetable* > other inanimate

What they note is that in nominative/accusative case systems, NOM-ACC syncretisms are more likely to occur towards the right-hand side of the hierarchy, i.e. in the less animate nominals. For instance, Indo-European languages regularly have NOM-ACC syncretism in nouns but typically lack it in pronouns. The systematic NOM-ACC syncretism found in neuter nouns in Indo-European (e.g. Greek and Latin) can also be seen as an instance of this correlation, in so far as these nouns typically have inanimate referents. In languages with split ergativity, on the other hand, the correlation is opposite, i.e. ERG-ABS syncretisms are more likely to occur with items higher on the hierarchy.

The hierarchy in (50) in fact conflates a number of different subhierarchies:

(51) a. Person: 1 > 2 > 3
b. Number: sg > du > pl
c. Animacy: animate > inanimate
d. Definiteness: definite > indefinite
e. Word class: pronoun > demonstrative > noun

Given the number subhierarchy (sg > non-singular), one expects this correlation to also be found with respect to number, i.e. non-singular number should favour NOM-ACC syncretism, and singular number ERG-ABS syncretism. However, this prediction is not borne out. Instead, both patterns of syncretism are more likely in the non-singular than in the singular. Similarly, gender syncretism occurs more easily in the non-singular than in the singular, as in e.g. Germanic, where gender

distinctions are typically lost in the plural. Obviously, this tendency for syncretism to occur more easily in the non-singular than in the singular strikingly resembles the one we observe in the pronoun paradigms under discussion here. Another reflex of the correlation between animacy and syncretism can be found in the fact that horizontal (cross-number) syncretism is far more common in the third person than in the first and second persons (see (9) above). These observations do not in and of themselves constitute an explanation for derivable but unattested (or rarer) syncretisms, but they do point to more general patterns that can be observed in other domains as well.

10 Conclusion

I have shown that the analysis of syncretism in multidimensional paradigms requires an extension of classical nanosyntactic theory. I have discussed two such extensions, one in terms of pointers, and another in terms of a Revised Superset Principle. Both approaches make different empirical predictions, notably with respect to the possible existence of ABA-patterns, and of certain types of diagonal syncretisms. Empirically, neither approach provides a perfect fit with the available data, but conceptually, the RSP is to be preferred as it rules out the derivation of ABA-patterns in principle.

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