# Pseudo-ABA patterns in pronominal morphology*

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**Abstract**

In this paper, I present an analysis of pseudo-ABA patterns of morphology found in pronominal forms. I argue that an analysis that assumes unrestricted phonologically null allomorphy or unrestricted impoverishment overgenerates, allowing all the logically possible patterns of syncretism to appear. An analysis that includes spanned portmanteau exponents generates all and only the attested patterns of syncretism. Pseudo-ABA patterns arise when the complete pronominal tree (the structure for the anaphor) is exponed by a spanned exponent for [A [D]] and an exponent for P. Spanned portmanteau exponents are compatible with an analysis in which A and D are cyclic nodes, and one in which they are not. However, the analysis in which A and D are cyclic nodes is incompatible with another morphological behaviour of pronominal forms, namely variable exponence. To provide a unified analysis of pseudo-ABA patterns and variable exponence, A and D cannot be cyclic nodes.
**Keywords:** ABA patterns, Distributed Morphology, portmanteau exponents, spanning, cyclicity, optional impoverishment

## 1 Introduction

In this paper, I present an analysis of pseudo-ABA patterns of morphology found in pronominal forms. The pronominal forms in question are anaphors, diaphors, and pronouns. By way of illustration, consider the pronominal forms of the Austronesian language Peranakan Javanese spoken in Semarang (henceforth PJS) in (1) (Cole *et al* 2007; 2015).

(1) *The pronominal forms of PJS*

a. Tono ketok **awake dheen dhewe** nggon kaca, Siti yaya.
Tono see **BODY DHEEN DHEWE** in mirror Siti also
'Tono$_i$ saw himself$_i$ in the mirror and Siti did too.'
→ Tono $\lambda x$ ($x$ saw $x$ in the mirror) and Siti $\lambda y$ ($y$ saw $y$ in the mirror)

b. Tono ngomong nek Bowo ketok **awake dheen** nggon kaca, Siti yaya.
Tono say C Bowo see **BODY DHEEN** in mirror Siti also
'Tono$_i$ said that Bowo saw him$_i$ in the mirror and Siti did too.'
→ Tono $\lambda x$ ($x$ said that Bowo saw $x$) and Siti $\lambda y$ ($y$ said that Bowo saw $y$)

c. Tono ngomong nek Bowo ketok **dheen** nggon kaca, Siti yaya.
Tono say C Bowo see **DHEEN** in mirror Siti also
'Tono$_i$ said that Bowo saw him$_j$ in the mirror and Siti did too.'
→ Tono $\lambda x$ ($x$ said that Bowo saw $z$) and Siti $\lambda y$ ($y$ said that Bowo saw $z$)

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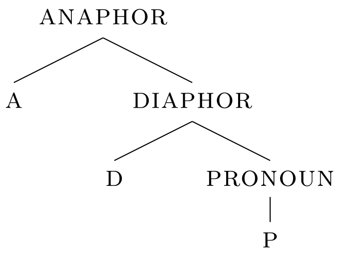
Anaphors are locally bound variables (1a), diaphors are non-locally bound variables (1b), and pronouns are free variables (1c) (Middleton 2020).[1]

Middleton 2020 ran a typological survey of the pronominal forms of 80 languages.[2] The morphological data uncovered by this research led Middleton to conclude that pronominal forms are structurally related to each other, such that anaphors contain diaphors, which in turn contain pronouns (2).

(2) *Tree structure for pronominal forms*




This structure is transparent in the morphology of the PJS pronominal forms, where *dheen* is the exponent of the pronoun feature P, *awake* is the exponent of the diaphor feature D, and *dhewe* is the exponent of the anaphor feature A. The features P, D and A introduce the interpretive restrictions on the pronominals: P is a variable associated with $\varphi$-features,[3] D introduces the restriction that the variable is now bound, and A adds the restriction that the anaphor's antecedent must be local (Middleton 2020).

In recent years there has been a profusion of studies into the absence of ABA patterns in morphology (e.g. Caha 2009; Bobaljik 2012; Moskal 2018; Smith *et al* 2019; Zompì 2019; Middleton 2020; Middleton *forthcoming*). Many of these studies have linked the absence of ABA patterns to the structure that underlies the morphological domain in question. For example, take the pronominal triplets in (3).

(3) *3rd person singular pronominal triplets* (Middleton 2020)

| | | | | | |
|---|---|---|---|---|---|
| ANAPHOR | ia | herself | ǰia ziji | awake dheen dhewe | X |
| DIAPHOR | ia | her | ǰia ziji | awake dheen | Y |
| PRONOUN | ia | her | ǰia | dheen | X |
| | AAA | AAB | ABB | ABC | *ABA |
| | Tongan | English | Xining Mandarin | Peranakan Javanese of Semarang | |

[1] The term *anaphor* for locally-bound variables is well-established, being derived from the Ancient Greek *aná* 'up' and *phérō* 'I carry'. Continuing with Ancient Greek, *diaphor* is a neologism, formed from *diá*, 'at variance' and *phérō*. This ensures that the term *diaphor* is consistent with the rest of the *phor* family: *anaphor*, *cataphor*, *endophor*, *exophor*, *logophor*.

[2] Middleton 2020 elicited the data for her survey in the following manner: The informant was told a story that disambiguates local binding (in which a person P is told about three people, X, Y and Z, such that X loves X, Y doesn't love Y, and Z doesn't love Z), and then asked to translate the corresponding sentence (*P thinks that only X loves x-self*) into their native language so that the translation is true for the story. This was then repeated for the stories and target sentences of the diaphor and pronoun. All data discussed in this paper can be found in the appendices of Middleton 2020: https://discovery.ucl.ac.uk/id/eprint/10105591/.

[3] Technically, the $\varphi$-features c-command P (Middleton 2020), as shown below when the 1st person pronouns of Tok Pisin, Dolakha Newar and Macushí are examined in (5), but as this level of decomposition is not necessary for the analysis of the patterns of syncretism found in pronouns, diaphors and anaphors, I don't represent it in (2).

The Polynesian language Tongan represents an AAA pattern of syncretism; whether the pronominal is a pronoun, a diaphor, or an anaphor, in the 3rd person the form is *ia.* English represents an AAB pattern of syncretism; 3rd person feminine pronouns and diaphors are exponed as *her*, while 3rd person feminine anaphors are exponed as *herself.* Xining Mandarin (Sino-Tibetan) represents an ABB pattern of syncretism; 3rd person pronouns are exponed as *jīa*, while 3rd person diaphors and anaphors are exponed as *jīa ziji.* PJS illustrates an ABC pattern of syncretism; its 3rd person pronoun is *dheen*, its 3rd person diaphor is *awake dheen*, and its 3rd person anaphor is *awake dheen dhewe.* Consistent with related morphological studies, Middleton 2020 found no cases of ABA patterns of syncretism where the pronoun and anaphor were syncretic to the exclusion of the diaphor in the 80 languages she surveyed.

But consider the pronominal paradigms of Babanki (Niger-Congo), Malayalam (Dravidian) and Yoruba (Niger-Congo) (Middleton 2020), which appear to pose a threat to this analysis (4).

(4) *The pronominal morphology of Babanki, Malayalam and Yoruba*

| | Babanki | Malayalam | Yoruba |
|---|---|---|---|
| ANAPHOR | əwénə́ wén | avanavan | ara rẹ́ |
| DIAPHOR | jì | tan | òun |
| PRONOUN | wén | avan | rẹ́ |

These are a problem for Middleton's analysis because they could arguably be analysed as three A-B-CA patterns. I call these pseudo-ABA patterns. The mystery is how the exponent for P is present within the anaphor, but absent from the diaphor.

Middleton 2020 analyses the morphological structures of pronominal forms in the Distributed Morphology framework (Halle & Marantz 1993). In this framework, the terminal nodes of trees are spelt out and sent to PF,[4] where they receive their phonological form. The phonological forms of the terminal nodes are determined by rules of exponence, which are found on the language's Exponent List (or Vocabulary List). The rules of exponence are governed by the Maximal Subset Principle (Kiparsky 1973; Halle & Marantz 1993). The Maximal Subset Principle states that for a given bundle of features, select the exponent that realises the maximal subset of that bundle of features. Thus, if the feature bundle is [F G], and there are two rules of exponence (F ⇔ eks, and [F G] ⇔ wai), the chosen exponent is *wai*, because *wai* realises the largest subset of features in that bundle. In the Babanki example in (4), there is a rule of exponence for P (P ⇔ wén) and a rule of exponence for [D [P]] ([D [P]] ⇔ jì). When the structure for the anaphor is sent to Spell Out, the feature bundle is [A [D [P]]]. The exponent for P should not appear in the morphology of the anaphor, because, by the Maximal Subset Principle, it is beaten by the exponent for [D [P]].

This problem is not restricted to anaphors, diaphors and pronouns. Examine the data of the Sino-Tibetan language Dolakha Newar (Genetti 2007, *via* Moskal 2018) and the Cariban language Macushí (Abbott 1991, *via* Moskal 2018) in (5).

(5) *The pronominal morphology of Tok Pisin, Dolakha Newar and Macushí*

| | Tok Pisin | Dolakha Newar | Macushí |
|---|---|---|---|
| 1PL.INC | yu-mi-pela | chi-ji | uurî-nî-kon |
| 1PL.EXC | mi-pela | isi | anna |
| 1SG | mi | ji | uurî |

[4]This process is cyclic, but the amount of structure that falls into a single cycle can vary; the second half of this paper addresses the size of a cycle for pronominal structures.

Again we see that the morpheme for the 1SG pronoun appears in the 1PL.INC but not in the 1PL.EXC. The paradigm of Tok Pisin, a Papuan creole of New Guinea, in (5) shows that the $1^{\text{st}}$ person pronouns are related by containment, such that the 1SG is contained within the 1PL.EXC, which is in turn contained within the 1PL.INC (Moskal 2018, see also Smith *et al* 2019). This is best represented featurally (though I will give a full analysis of these cases later in the paper). The $1^{\text{st}}$ person pronouns can be distinguished from their $2^{\text{nd}}$ and $3^{\text{rd}}$ counterparts by the feature [+author]. A second feature is required to distinguish the plurals from the singular; since plural is marked with respect to singular (Universal 35, Greenberg 1963) the feature [−atomic] achieves this. Finally, a third feature is required to distinguish the inclusive from the exclusive. Within the system proposed by Harbour 2016, in which features apply semantically in a particular order, this feature would be [+participant]. These feature bundles are given in (6).[5]

(6) *Minimal feature bundles for $1^{\text{st}}$ person pronouns*

$$\begin{bmatrix} \text{1SG} \\ \\ \text{+author} \\ \\ \end{bmatrix} \begin{bmatrix} \text{1PL.EXC} \\ \\ \text{+author} \\ -\text{atomic} \end{bmatrix} \begin{bmatrix} \text{1PL.INC} \\ \text{+participant} \\ \text{+author} \\ -\text{atomic} \end{bmatrix}$$

Now that we have identified the accumulation of features that accounts for the containment of 1SG in 1PL.EXC, and the containment of 1PL.EXC in 1PL.INC, we can re-frame the problem thusly: the mystery is how the exponent for [+author] is present within the 1PL.INCL pronoun, but absent from the 1PL.EXC pronoun.

In this paper, I will argue that the problematic data from Babanki, Malayalam, Yoruba, Dolakha Newar and Macushí can be accounted for, and the containment relationships in (2) and (6) maintained, if our analysis (a) adopts spanned exponents (Svenonius 2012), and (b) takes the A and D nodes of the tree in (2) (and the $\pi$ and # nodes that host pronominal $\varphi$-features) to be non-cyclic.

The paper is structured as follows. In the first half of the paper, I address the problem of pseudo-ABA patterns. In §2, I show that null allomorphy and impoverishment analyses overgenerate. In §3, I present the alternative analysis, which makes use of portmanteau spanned exponents. In the second half of the paper, I turn to the question of cyclicity. There is precedent in the literature for certain morphological nodes to be cyclic (e.g. Embick 2010; Bobaljik 2012; Moskal 2015), but the amount of structure that falls into a single cycle can vary. I address this issue here. In §4, I expand on the cyclic analysis of Bobaljik 2012, and show how it successfully accounts for the present data. In §5, I show that the only analysis that is compatible with an independently required analysis of variable exponence is the one in which the A and D nodes are not cyclic. I conclude in §6.

## 2 Ruling out null allomorphy and impoverishment

I will focus on the data in (4), and will return to the data in (5) in §3. Let's begin by considering an allomorphy account of the pseudo-ABA patterns of syncretism. In this analysis, P and D each have two allomorphs: a phonologically overt one (*ré̩* and *òun* respectively), and a phonologically null one (7).[6,7]

[5] I will return to these examples later in the paper.

[6] It would also be possible to posit two phonologically overt allomorphs of P (*ré̩*, and *òun* in the presence of D), and have D realised by a phonologically null exponent; both analyses produce the required paradigm.

[7] I assume that all pronominals merge with the Case head K when complete.

(7) *Exponents of Yoruba (Take 1)*

| | | |
|---|---|---|
| P | ⇔ | ∅ / [K [D [ __ ]]] |
| P | ⇔ | ré̩ |
| D | ⇔ | ∅ / [A [ __ [P]]] |
| D | ⇔ | òun |
| A | ⇔ | ara |

(8) *A hypothetical exponent for* A

| | | |
|---|---|---|
| P | ⇔ | ∅ / [K [D [ __ ]]] |
| P | ⇔ | ré̩ |
| D | ⇔ | ∅ / [A [ __ [P]]] |
| D | ⇔ | òun |
| **A** | **⇔** | **∅** |

The rules of exponence in (7) generate the paradigm for Yoruba (and Babanki and Malayalam) exactly. However, suppose the feature A was realised by a phonologically null exponent instead of the phonologically overt *ara* (8).[8] This is equivalent to not being realised at all, and there is ample evidence from cases of underspecification that features are frequently unrealised at PF. Replacing the phonologically overt exponent for A with a phonologically null one results in a true ABA pattern for Yoruba, yet no such pattern was found in any of the 80 languages in Middleton's survey; this is exactly the kind of pattern the theory must fail to generate.

A reviewer notes that in the Distributed Morphology framework all terminal nodes must be sent to Spell Out, and asks whether it follows from this that all terminal nodes must receive a phonological form at PF, including phonologically null exponents for those terminal nodes that are unpronounced. While it is true that in the Distributed Morphology framework every terminal node must be sent to Spell Out, it does not follow that every terminal node that is unpronounced bears a phonologically null exponent. All terminal nodes are sent to Spell Out, but when they reach PF and the Exponent List is consulted, it is perfectly possible that there is no rule of exponence for a particular terminal node. This node is then phonologically silent, *but does not have a phonologically null exponent.*[9]

Phonologically null exponents are required however. Take the English nouns *sheep*, *aircraft*, *moose*, *shrimp*, *fish*, *deer* and *grouse*. These are identical in the singular and plural. Since there is a default plural marker in English (-*s*), these irregular plural forms can only be accounted for in a Distributed Morphology analysis if there is a more highly specified phonologically null plural marker for this particular set of nouns (9), which 'beats' the default plural marker -*s* as per the Maximal Subset Principle.

(9) *An irregular rule of exponence for the English plural*

$$[-\text{atomic}] \Leftrightarrow \varnothing \;/\; \left\{ \begin{array}{c} \sqrt{sheep}\_\_ \\ \sqrt{aircraft}\_\_ \\ \sqrt{moose}\_\_ \\ ... \end{array} \right\}$$

While this English data shows that phonologically null exponents are motivated, it does not follow that phonologically null exponents can be posited without restriction. Here I show that they should only be posited when positively motivated, as in the English examples in (9); if they aren't our theory is too powerful, and any morphological paradigm can materialise.

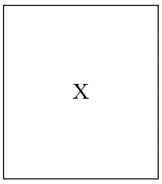
[8] Thanks to Klaus Abels, Yasu Sudo and Stan Zompì for pointing this problem out to me.

[9] This is simply an extension of underspecification. The English 3$^{rd}$ person feminine accusative and 3$^{rd}$ person feminine genitive pronouns are identical: *her*. This is accounted for in the Distributed Morphology framework by the case features ACC and GEN not receiving phonological exponence at PF when the pronoun is 3$^{rd}$ person feminine. By extension, then, it is perfectly possible that a terminal node hosts a feature or bundle of features, none of which receive a phonological exponent at PF. In other words, there is no rule in Distributed Morphology like (i).

(i) *A non-existent rule in Distributed Morphology*
At least one feature of a terminal node must receive a phonological exponent at PF.

Let's pause for a moment to consider all of the logically possible morphological patterns available to the tree structure [A [D [P]]]; all − including true ABA patterns − can be generated by a theory that assumes unrestricted phonologically null exponents. In the case of a monopartition of the paradigm, only an AAA sycretism pattern is possible. Here, only the exponent for P is overt; the exponents for D and A are phonologically null (10). I represent the exponent for P abstractly as X.

(10) *An abstract representation of the AAA syncretism paradigm*

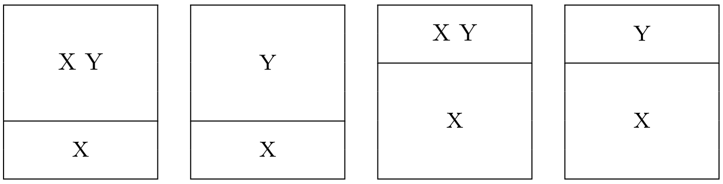



AAA

| Exponents | | |
|---|---|---|
| P | ⇔ | X |
| D | ⇔ | ∅ |
| A | ⇔ | ∅ |

In the case of a bipartition, we get ABB and AAB syncretism patterns. Two overt exponents are required: X and Y. If both exponed features can be realised overtly together we see the paradigms of $ABB_1$ and $AAB_1$. But if only one exponent is overt at any given time ($ABB_2$ and $AAB_2$) (11), a phonologically null exponent for P is also required (12).

(11) *Morphological possibilities for the ABB and AAB syncretism paradigms*




$ABB_1$ $ABB_2$ $AAB_1$ $AAB_2$

(12) *Exponents for the ABB and AAB paradigms under a null allomorphy account*

| $ABB_1$ | | | $ABB_2$ | | | $AAB_1$ | | | $AAB_2$ | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| P | ⇔ | X | P | ⇔ | X | P | ⇔ | X | P | ⇔ | X |
| D | ⇔ | Y | P | ⇔ | ∅ / [D [ __ ]] | A | ⇔ | Y | P | ⇔ | ∅ / [A [D [ __ ]]] |
| | | | D | ⇔ | Y | | | | A | ⇔ | Y |

We now come to the triparition, which generates ABC and ABA patterns of syncretism. There are 12 logically possible morphological realisations to consider. In all 12 cases, P is realised by an exponent {X}. When P merges with D to form the diaphor, either both features are overtly exponed ($ABC_{1-6}$ and $ABA_4$), or only D is, and P is phonologically null ($ABC_{7-12}$ and $ABA_{11}$). For each of these realisations of the diaphor, there are seven possibilities for the exponence of the anaphor. Firstly, the anaphor could be made up of both P's and D's exponents, plus a new one: Z. Secondly, the anaphor could be composed of only two morphemes; {X Y}, {X Z}, or {Y Z}. Finally, the anaphor could be realised by only one morpheme; {X}, {Y} or {Z}.[10] All these possibilities can be generated with phonologically null exponents, as the diagrams in (13) and Exponent Lists in (14) show.

[10]The seven possible realisations of the anaphor do not result in 14 possible ABC and ABA patterns, because two are ABB patterns: when both the diaphor and anaphor are {X Y} or {Y}.

(13) *Morphological possibilities for the ABC and ABA syncretism paradigms*

| | | | | | |
|---|---|---|---|---|---|
| X Y Z | X Z | Y Z | X | Y | Z |
| X Y | X Y | X Y | X Y | X Y | X Y |
| X | X | X | X | X | X |
| ABC$_1$ | ABC$_2$ | ABC$_3$ | ABA$_4$ | ABC$_5$ | ABC$_6$ |

| | | | | | |
|---|---|---|---|---|---|
| X Y Z | X Y | X Z | Y Z | X | Z |
| Y | Y | Y | Y | Y | Y |
| X | X | X | X | X | X |
| ABC$_7$ | ABC$_8$ | ABC$_9$ | ABC$_{10}$ | ABA$_{11}$ | ABC$_{12}$ |

(14) *Exponents for the ABC and ABA paradigms under an allomorphy account*

| ABC$_1$ | | | ABC$_2$ | | | ABC$_3$ | | |
|---|---|---|---|---|---|---|---|---|
| P | $\Leftrightarrow$ | X | P | $\Leftrightarrow$ | X | P | $\Leftrightarrow$ | X |
| D | $\Leftrightarrow$ | Y | D | $\Leftrightarrow$ | Y | P | $\Leftrightarrow$ | $\varnothing$ / [A [D [ __ ]]] |
| A | $\Leftrightarrow$ | Z | D | $\Leftrightarrow$ | $\varnothing$ / [A [ __ ]] | D | $\Leftrightarrow$ | Y |
| | | | A | $\Leftrightarrow$ | Z | A | $\Leftrightarrow$ | Z |
| **ABA$_4$** | | | **ABC$_5$** | | | **ABC$_6$** | | |
| P | $\Leftrightarrow$ | X | P | $\Leftrightarrow$ | X | P | $\Leftrightarrow$ | X |
| D | $\Leftrightarrow$ | Y | P | $\Leftrightarrow$ | $\varnothing$ / [A [D [ __ ]]] | P | $\Leftrightarrow$ | $\varnothing$ / [A [D [ __ ]]] |
| D | $\Leftrightarrow$ | $\varnothing$ / [A [ __ ]] | D | $\Leftrightarrow$ | Y | D | $\Leftrightarrow$ | Y |
| | | | | | | D | $\Leftrightarrow$ | $\varnothing$ / [A [ __ ]] |
| | | | | | | A | $\Leftrightarrow$ | Z |
| **ABC$_7$** | | | **ABC$_8$** | | | **ABC$_9$** | | |
| P | $\Leftrightarrow$ | X | P | $\Leftrightarrow$ | X | P | $\Leftrightarrow$ | X |
| P | $\Leftrightarrow$ | $\varnothing$ / [K [D [ __ ]]] | P | $\Leftrightarrow$ | $\varnothing$ / [K [D [ __ ]]] | P | $\Leftrightarrow$ | $\varnothing$ / [K [D [ __ ]]] |
| D | $\Leftrightarrow$ | Y | D | $\Leftrightarrow$ | Y | D | $\Leftrightarrow$ | Y |
| A | $\Leftrightarrow$ | Z | | | | D | $\Leftrightarrow$ | $\varnothing$ / [A [ __ ]] |
| | | | | | | A | $\Leftrightarrow$ | Z |
| **ABC$_{10}$** | | | **ABA$_{11}$** | | | **ABC$_{12}$** | | |
| P | $\Leftrightarrow$ | X | P | $\Leftrightarrow$ | X | P | $\Leftrightarrow$ | X |
| P | $\Leftrightarrow$ | $\varnothing$ / [D [ __ ]] | P | $\Leftrightarrow$ | $\varnothing$ / [K [D [ __ ]]] | P | $\Leftrightarrow$ | $\varnothing$ / [D [ __ ]] |
| D | $\Leftrightarrow$ | Y | D | $\Leftrightarrow$ | Y | D | $\Leftrightarrow$ | Y |
| A | $\Leftrightarrow$ | Z | D | $\Leftrightarrow$ | $\varnothing$ / [A [ __ ]] | D | $\Leftrightarrow$ | $\varnothing$ / [A [ __ ]] |
| | | | | | | A | $\Leftrightarrow$ | Z |

As the diagrams in (13) and Exponent Lists in (14) show, a theory that assumes unrestricted phonologically null allomorphs generates two true ABA patterns (ABA$_4$ and ABA$_{11}$) and three pseudo-ABA patterns (ABC$_7$, ABC$_8$ and ABC$_9$). But none of the languages in Middleton's 80-strong sample demonstrates a true ABA pattern of syncretism, and only Babanki, Malayalam and Yoruba demonstrate pseudo-ABA patterns. Indeed, of the 17 logically possible patterns, only eight are attested. Examples of these are given in (15).

(15) *Attested patterns of syncretism* (Middleton 2020)

| | | | | |
|---|---|---|---|---|
| ia | jīa ziji | casin | herself | itseään |
| | jīa | ku | her | häntä |
| AAA | ABB$_1$ | ABB$_2$ | AAB$_1$ | AAB$_2$ |
| Tongan | Xining Mandarin | Korean | English | Finnish |

| | | |
|---|---|---|
| awake dheen dhewe | ara rẹ́ | dirinya |
| awake dheen | òun | diri |
| dheen | rẹ́ | dia |
| ABC$_1$ | ABC$_9$ | ABC$_{10}$ |
| Peranakan Javanese of Semarang | Yoruba | Malay |

Ergo, an account that assumes unrestricted phonologically null allomorphy is too permissive; phonologically null exponents should only be posited when there is clear evidence for them, as in the English examples in (9). The same problem applies to an account that assumes unrestricted impoverishment. Suppose we have the rules of exponence for Yoruba given in (16).

(16) *Exponents of Yoruba (Take 2)*

P ⇔ rẹ́
D ⇔ òun
A ⇔ ara

(17) *Two rules of impoverishment*[11]

P → ↯ / [K [D [ __ ]]]
D → ↯ / [A [ __ [P]]]

To explain the absence of the morpheme *rẹ́* from the Yoruba diaphor, the feature that would be the target of impoverishment is P, and the environment for that impoverishment is in the presence of D and K(ase) (17). To explain the absence of the morpheme *òun* from the Yoruba anaphor, the feature that would be the target of impoverishment is D, and the environment for that impoverishment is in the presence of P and, crucially, A (17).

But, as was the case with the null allomorphy account, it would also be possible to have a rule of impoverishment that applied to A (so that the morpheme *ara* never surfaces), generating an unattested ABA pattern. Extending this reasoning further, if every rule of phonologically null allomorphy in (12) and (14) were replaced by its equivalent rule of impoverishment, we see immediately that all 17 of the logically possible patterns of syncretism available to the tree structure [A [D [P]]] can be generated. In conclusion, a theory that assumes unrestricted phonologically null allomorphs or unrestricted impoverishment is too permissive; we want a more restrictive theory.

## 3 An alternative analysis

I propose that the solution to the problem of pseudo-ABA patterns of syncretism is exponents that spell out structurally adjacent nodes. The diaphors *jì*, *tan* and *òun* appear to be completely suppletive,

[11] I use the lightning symbol {↯} for impoverishment, and the empty set symbol {∅} for a phonologically null exponent.

exponing [D [P]]. If they expone this larger structure, then the exponents that appear only in the anaphors – *ə̀wə́nə́*, the reduplicated morpheme *avan*, and *ara* – cannot spell out A alone. This is because by the Maximal Subset Principle (Kiparsky, 1973; Halle & Marantz 1993), the exponents for P would never be a component of the anaphor forms; the diaphor portmanteaux would always 'beat' the exponents for P. The exponents *ə̀wə́nə́*, the reduplicated *avan*, and *ara* must therefore spell out a structure that is complex enough to 'beat' the exponents of [D [P]] for insertion without 'beating' the P exponents. This is possible if the structure these exponents spell out is [A [D]] (18).

(18) *The exponents of Babanki, Malayalam and Yoruba (final)*

| Babanki | | | Malayalam | | | Yoruba | | |
|---|---|---|---|---|---|---|---|---|
| P | ⇔ | wə́n | P | ⇔ | avan | P | ⇔ | rẹ́ |
| [D [P]] | ⇔ | jì | [D [P]] | ⇔ | tan | [D [P]] | ⇔ | òun |
| [A [D]] | ⇔ | ə̀wə́nə́ | [A [D]] | ⇔ | REDUP | [A [D]] | ⇔ | ara |

The notion of a single exponent spelling out structurally adjacent nodes that do not form a constituent has been given the name *Spanning* in the recent literature (see for example, Svenonius 2012).[12] The exponent that spells out the span of A and D combines with the exponent for P to spell out the whole structure of the anaphor. This blocks the use of the portmanteau that spells out [D [P]], because there is no exponent for A alone; the combination of an exponent for P and another for A and D 'beats' the portmanteau of [D [P]] by the Maximal Subset Principle.

This analysis relaxes the ban on competition between exponents (in the sense of Embick & Marantz 2008) a fraction; competition between exponents is now possible when multiple terminal nodes spell out in a single cycle. In other words, within a single cycle of Spell Out, the Maximal Subset Principle must hold. Since I assume (and argue in §5) that P, D and A are not cyclic nodes, they will all spell out in the same cycle when the pronominal merges with higher structure (presumably K(ase)), and competition between exponents is thus allowed.

It is impossible to generate a true ABA pattern of syncretism in such a system.[13] Consider why. There will always be an exponent for P: X. The diaphor could be exponed by two exponents, one for D alongside that of P, as is the case in the first three paradigms in (19), or it could be exponed by a portmanteau for [D [P]], as is the case in the last three paradigms in (19).

(19) *True ABA patterns of syncretism are impossible*

| ABC$_1$ | ABC$_2$ | ABC$_6$ | ABC$_9$ | ABC$_{10}$ | ABC$_{12}$ |
|---|---|---|---|---|---|
| X Y Z | X Z | Z | X Z | Y Z | Z |
| X Y | X Y | X Y | Y | Y | Y |
| X | X | X | X | X | X |

There are then three possible ways in which A could be exponed (20). If A is exponed alone by Z (20a), the anaphor will be realised as /X Y Z/ or /Y Z/ (ABC$_1$ and ABC$_{10}$). If A is exponed in a span with D (20b), then the anaphor will be realised as /X Z/ (ABC$_2$ and ABC$_9$). And if A is exponed by a

[12]Exponents that spell out multiple nodes that form a constituent are simply a special type of span.

[13]A reviewer notes that there is the homophony loophole: a true or pseudo- ABA pattern of syncretism could arise if the exponent for [A [D [P]]] or the exponent for A is accidentally homophonous with the exponent for P. Bobaljik 2012 notes the same problem for *ABA suppletion patterns in the adjectival domain, and argues that while the grammar doesn't exclude this possibility per se, there is a general antihomophony bias in acquisition which accounts for the absence of homophonous exponents (Bobaljik 2012:35).

portmanteau that expones both D and P as well (20c), the the anaphor will be realised as /Z/ ($ABC_6$ and $ABC_{12}$).

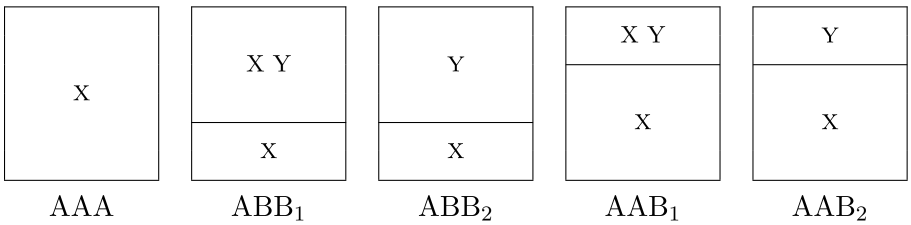
(20) *Possible ways to expone* A

a. A ⇔ Z
b. [A [D]] ⇔ Z
c. [A [D [P]]] ⇔ Z

Note that the structure of the anaphor ensures that there will never be a morpheme that spells out P and A to the exclusion of D; this would be possible in an analysis in which the anaphor did not necessarily contain the diaphor, or in an analysis in which the three features bundle together on a single terminal node. Thus, the absence of exponents that spell out P and A to the exclusion of D (i.e. the absence of the Z morpheme in $ABC_3$) lends support to the structural analysis of pronominal forms.

Now let's look at the remaining logically possible patterns of syncretism. Generating the AAA, ABB and AAB patterns of syncretism is straightforward; I repeat the diagrams below (21), and give the required exponents in (22).

(21) *Morphological possibilities for AAA, ABB and AAB syncretism paradigms*




(22) *The exponents for the AAA, ABB and AAB patterns of syncretism*

| AAA | ABB$_1$ | ABB$_2$ | AAB$_1$ | AAB$_2$ |
|---|---|---|---|---|
| P ⇔ X | P ⇔ X | P ⇔ X | P ⇔ X | P ⇔ X |
| | D ⇔ Y | [D [P]] ⇔ Y | A ⇔ Y | [A [D [P]]] ⇔ Y |

Accounting for the attested and unattested ABC and ABA patterns of syncretism initially appears to be less successful: the new theory generates twice as many patterns as are attested in Middleton's (2020) language sample (including all the attested cases), but this is still an improvement, as it generates half as many as the null allomorphy analysis does. I repeat the diagrams below (23), and give the required exponents in (24).

(23) *Morphological possibilities for the ABC and ABA syncretism paradigms*

| $ABC_1$ | $ABC_2$ | $ABC_3$ | $ABA_4$ | $ABC_5$ | $ABC_6$ |
|---|---|---|---|---|---|
| X Y Z | X Z | Y Z | X | Y | Z |
| X Y | X Y | X Y | X Y | X Y | X Y |
| X | X | X | X | X | X |
| Attested Generated | **Unattested Generated** | Unattested | Unattested | Unattested | **Unattested Generated** |

| $ABC_7$ | $ABC_8$ | $ABC_9$ | $ABC_{10}$ | $ABA_{11}$ | $ABC_{12}$ |
|---|---|---|---|---|---|
| X Y Z | X Y | X Z | Y Z | X | Z |
| Y | Y | Y | Y | Y | Y |
| X | X | X | X | X | X |
| Unattested | Unattested | Attested Generated | Attested Generated | Unattested | **Unattested Generated** |

(24) *The exponents for the ABC and ABA patterns of syncretism*

| $ABC_1$ | $ABC_2$ | $ABC_3$ | $ABA_4$ |
|---|---|---|---|
| P ⇔ X | P ⇔ X | | |
| D ⇔ Y | D ⇔ Y | – | – |
| A ⇔ Z | [A [D]] ⇔ Z | | |

| $ABC_5$ | $ABC_6$ | $ABC_7$ | $ABC_8$ |
|---|---|---|---|
| | P ⇔ X | | |
| – | D ⇔ Y | – | – |
| | [A [D [P]]] ⇔ Z | | |

| $ABC_9$ | $ABC_{10}$ | $ABA_{11}$ | $ABC_{12}$ |
|---|---|---|---|
| P ⇔ X | P ⇔ X | | P ⇔ X |
| [D [P]] ⇔ Y | [D [P]] ⇔ Y | – | [D [P]] ⇔ Y |
| [A [D]] ⇔ Z | A ⇔ Z | | [A [D [P]]] ⇔ Z |

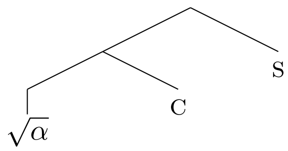
$ABC_3$ cannot be generated, because this would require either a rule of exponence in which [P A] is realised by an exponent Z, which is impossible due to the intervening D, or a phonologically null allomorph for P that appears in the anaphor. The other five patterns that cannot be generated are also ruled out unless phonologically null allomorphs are allowed back into the analysis without restrictions: $ABA_4$ requires a phonologically null allomorph for D in the anaphor; $ABC_5$ requires a phonologically null allomorph for P in the anaphor; $ABC_7$ requires a phonologically null allomorph for P in the diaphor, which does not appear in the presence of a phonologically overt A; and $ABC_8$ and $ABA_{11}$ require a phonologically null allomorph for P in the diaphor, which does not appear in the presence of a phonologically null A.

The patterns generated but unattested in the pronominal domain are $ABC_2$, $ABC_6$ and $ABC_{12}$. If we consider data from domains other than the pronominal one, the missing ABC patterns emerge. Take the English data in (25) and the relevant tree structure for comparatives (C) and superlatives (S) in (26). From a survey of the adjectival morphology of over 300 languages, Bobaljik 2012 concluded that comparatives contain adjectives, and superlatives contain comparatives. The English data for *tall* exactly matches the missing pattern in $ABC_2$, as is shown in (27).

(25) *English: 'tall'*

| | |
|---|---|
| Adjective | *tall* |
| Comparative | *tall-er* |
| Superlative | *tall-est* |

(26) *The adjectival tree* (Bobaljik 2012)




(27) *Evidence for* $ABC_2$*: English comparatives and superlatives*

| $ABC_2$ | English |
|---|---|
| X Z | tall-est |
| X Y | tall-er |
| X | tall |

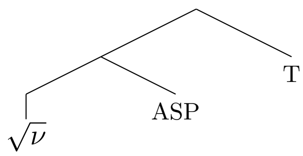
| Exponents | | |
|---|---|---|
| $\sqrt{tall}$ | ⇔ | tall |
| [S [C]] | ⇔ | -est |
| C | ⇔ | -er |

Observe the Ingush (Nakh, North East Caucasian) data in (28) (Veselinova 2006:76). Following Cinque 1999, Radkevich 2010 and Moskal 2015, I assume the verbal structure to be that given in (29). I assume that the present tense is denoted by the absence of the Aspect and Tense nodes, and if we assume that the Witnessed Past Tense includes some denotation of Aspect, the Ingush data exactly matches the morphological pattern of $ABC_6$, as can be seen in (30).

(28) *Ingush (Nakh): 'give'*

| | |
|---|---|
| *lu* | GIVE.PRES |
| *lu-ora* | GIVE.PRES-IMPF |
| *d-alar* | ⚥CL-GIVE.WIT.PAST |

(29) *The verbal tree*




(30) *Evidence for* $ABC_6$*: Ingush verbs*

| $ABC_6$ | Ingush |
|---|---|
| Z | alar |
| X Y | lu-ora |
| X | lu |

| Exponents | | |
|---|---|---|
| [WIT.PAST [ASP [$\sqrt{give}$]]] | ⇔ | alar |
| $\sqrt{give}$ | ⇔ | lu |
| IMPF | ⇔ | -ora |
| ⚥ CLASS | ⇔ | d- |

The $ABC_6$ pattern can also be seen in the pronoun domain for Case. The following data is from Smith *et al* 2019. The unmarked Case is contained within the marked Case, and the marked Case is contained within the oblique Case: [Oblique [Marked [Unmarked]]] (Smith *et al* 2019; Zompì 2019).

(31) *More evidence for ABC$_6$: Pronouns inflected for Case*

| | ABC$_6$ | Yanyuwa 3SG.M | Gooniyandi 1SG | Gooniyandi 3SG |
|---|---|---|---|---|
| Oblique | Z | ayu | ngaddagi | nhoowoo |
| Marked | X Y | alhi-nja | nganyi-ngga | niyi-ngga |
| Unmarked | X | alhi | nganyi | niyi |

| | Jingulu 1SG | Jingulu 2SG | Wardaman 3SG | Wardaman 3PL |
|---|---|---|---|---|
| Oblique | ngarr- | ngaank- | gunga | wurrugu |
| Marked | ngaya-rni | nyama-rni | narnaj-(j)i | narnjbulu-yi |
| Unmarked | ngaya | nyama | narnaj | narnajbulu |

Finally, behold the Georgian data in (32) (Hewitt 1995:471). The relevant structure remains the verbal one in (29). It is evident from the data presented (and further data provided in Hewitt 1995) that the Imperfective Aspect is unmarked, while the Perfective is marked; I conclude that the absence of the Aspect node indicates the Imperfective. The root *tell* is thus exponed as -*ubn*- when a more specific exponent is unavailable. When Perfective Aspect merges above *tell*, the two are exponed together as -*txar*-. If we assume that the Future Tense of *tell* includes some denotation of Aspect,[14] then Future Tense, Aspect and *tell* are exponed as the portmanteau -*t'q'v*-, and we have an instance of the the morphological pattern of ABC$_{12}$ (33).

(32) *Georgian (Kartvelian): 'tell'*[15]

| | |
|---|---|
| *v-e-**ubn**-eb-i* | 1SG-*vv*-**TELL.IPFV**-THM-IND |
| *v-e-**ubn**-eb-od-i* | 1SG-*vv*-**TELL.IPFV**-THM-THM-IND |
| *v-u-**txar**-i* | 1SG-*vv*-**TELL.PFV**-IND |
| *v-e-**t'q'v**-i* | 1SG-*vv*-**TELL.FUT**-IND |

(33) *Evidence for ABC$_{12}$: Georgian verbs*

| ABC$_{12}$ | Georgian |
|---|---|
| Z | -t'q'v- |
| Y | -txar- |
| X | -ubn- |

| Exponents | | | | | |
|---|---|---|---|---|---|
| [FUT [ASP [$\sqrt{tell}$]]] | ⇔ | -t'q'v- | 1SG | ⇔ | v- |
| [PFV [$\sqrt{tell}$]] | ⇔ | -txar- | *vv* | ⇔ | -e-/-u- |
| $\sqrt{tell}$ | ⇔ | -ubn- | THM | ⇔ | -eb-/-od- |
| | | | IND | ⇔ | -i |

[14] The alternative would be to conclude that the Aspect node is absent from the verbal tree when the Tense is Future; this would require an impoverishment rule deleting ASP in the context of FUT, which is impossible due to the Russian Doll Deletion Constraint (Ackema & Neeleman 2018); see Example (54) in §5.

[15] THM = Thematic Marker.

The $ABC_{12}$ pattern can also be seen in the pronominal domain. In (34), for example, are two cases; Khinalugh (Northeast Caucasian) 1SG pronouns which inflect for Case (Smith *et al* 2019), and Bukiyip (Austronesian) 2nd person pronouns, inflected for Number (Smith *et al* 2019). Plenty more examples of pronouns that display the $ABC_{12}$ pattern with Number inflection can be found in Smith *et al* 2019.

(34) *More evidence for $ABC_{12}$: Pronouns inflected for Case and Number*

| | Khinalugh 1SG | | Bukiyip 2π | |
|---|---|---|---|---|
| Oblique | as(ir) | Dual | bwiepu | [# −atomic +minimal] |
| Marked | jä | Plural | ipak | [# −atomic] |
| Unmarked | zi | Singular | nyak | [#] |

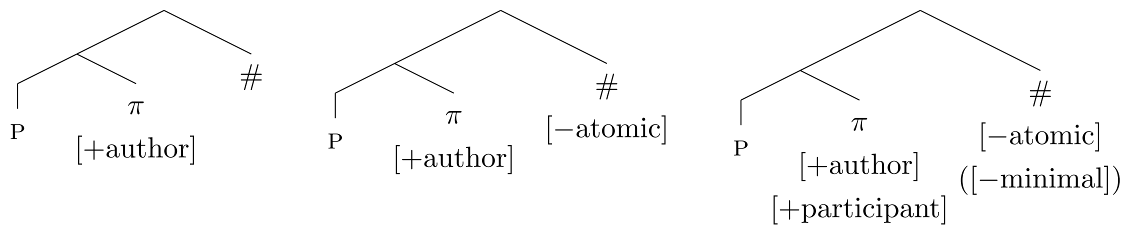
We can now return to the data from Dolakha Newar and Macushí, $ABC_9$, which is repeated in (35) with the relevant feature bundles (Harbour 2014; 2016).

(35) *The pronominal morphology of Dolakha Newar and Macushí*

| | Dolakha Newar | Macushí | |
|---|---|---|---|
| 1PL.INC | chi-ji | uurî-nî-kon | [+author −atomic +participant (−minimal)] |
| 1PL.EXC | isi | anna | [+author −atomic −participant] |
| 1SG | ji | uurî | [+author] |

The tree structures that host the pronouns' $\varphi$-features are those in (36) (Moskal 2018, see also Middleton 2020:§2.3.3).

(36) *The tree structures of the 1st person pronouns*




1SG 1PL.EXC 1PL.INC

The rules of exponence for Dolakha Newar are straightforward, and given in (37).

(37) *Rules of Exponence for Dolakha Newar and Macushí*

| Dolakha Newar | | | Macushí | | |
|---|---|---|---|---|---|
| [+participant −atomic] | ⇔ | chi- | [+participant −atomic] | ⇔ | -kon |
| [+author −atomic] | ⇔ | isi | [+author −atomic] | ⇔ | anna |
| [+author] | ⇔ | ji | [+author] | ⇔ | uurî |
| | | | [−minimal] | ⇔ | nî |

The Macushí data decomposes in the same way, but with an additional exponent for [−minimal], *nî*, which is absent in the 1DL.INC (*uurî-kon*).

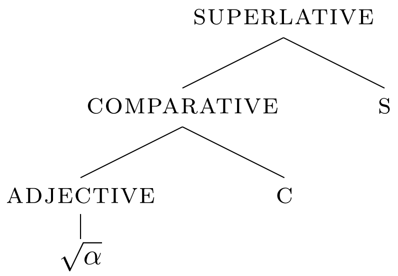
In conclusion, exponents that spell out adjacent nodes in trees generate all and only the patterns of syncretism that I am aware are attested.

## 4 Bobaljik 2012: A cyclic analysis

The discussion so far has taken it for granted that the nodes A and D are not cyclic, and the domain for Vocabulary Insertion is the complete pronominal tree. This goes against the precedent in the literature, where it has generally been assumed that trees spell out cyclically (e.g. Embick 2010; Bobaljik 2012; Moskal 2015). In this section, I present Bobaljik's 2012 cyclic analysis of patterns of suppletion in the adjectival domain, and demonstrate that if A and D are cyclic nodes, this analysis will account for the syncretism data with identical results.[16]

As mentioned briefly before, from a survey of the adjectival morphology of over 300 languages, Bobaljik 2012 concluded that comparatives contain adjectives, and superlatives contain comparatives (38).

(38) *The adjectival tree* (Bobaljik 2012)




The particular phenomenon at the heart of this study was suppletion of the adjectival root. There are ten logically possible morphological paradigms for suppletion, two for each pattern of suppletion. In the first paradigm of each pair (the top row of (39)), both the comparative and superlative suffixes -$\beta$ and -$\delta$ appear overtly in the superlative, while in the second paradigm (the bottom row of (39)), only the suffix -$\delta$ appears. Allomorphs of the root are X, Y and Z (although in $\mathrm{AAB_{II}}$ and $\mathrm{ABC_{II}}$, Y and Z will be analysed as portmanteaux of the root and comparative suffix; see below for discussion). I number the patterns of suppletion with Roman numerals, to distinguish them from patterns of syncretism, which are given Arabic numerals.

[16] I will focus on the analysis in Bobaljik 2012, because the differences between this analysis and those in Embick 2010 and Moskal 2015 are to do with non-adjacent nodes conditioning suppletion. Since the data being investigated in the present paper concerns syncretism, not suppletion, Bobaljik's 2012 analysis suffices to represent cyclic analyses more generally.

(39) *Morphological possibilities for suppletion of the root*

| | | | | |
|---|---|---|---|---|
| X $\beta$ $\delta$ | Y $\beta$ $\delta$ | X $\beta$ $\delta$ | Y $\beta$ $\delta$ | Z $\beta$ $\delta$ |
| X $\beta$ | X $\beta$ | Y $\beta$ | Y $\beta$ | Y $\beta$ |
| X | X | X | X | X |
| $AAA_I$ | $AAB_I$ | $ABA_I$ | $ABB_I$ | $ABC_I$ |

| | | | | |
|---|---|---|---|---|
| X $\delta$ | Y $\delta$ | X $\delta$ | Y $\delta$ | Z $\delta$ |
| X $\beta$ | X $\beta$ | Y $\beta$ | Y $\beta$ | Y $\beta$ |
| X | X | X | X | X |
| $AAA_{II}$ | $AAB_{II}$ | $ABA_{II}$ | $ABB_{II}$ | $ABC_{II}$ |

In Bobaljik's 2012 survey, only five of the ten possible paradigms are attested. Examples of each are shown in (40).

(40) *Examples of suppletion* (Bobaljik 2012)

| | | | | |
|---|---|---|---|---|
| leg-nagy-obb | tall-est | nej-men-ši | be-st | opt-imus |
| nagy-obb | tall-er | men-ši | bett-er | mel-ior |
| nagy | tall | mal-ý | good | bon-us |
| $AAA_I$ | $AAA_{II}$ | $ABB_I$ | $ABB_{II}$ | $ABC_{II}$ |
| Hungarian | English | Czech | English | Latin |
| *big* | *tall* | *small* | *good* | *good* |

Missing from Bobaljik's survey are all of the AAB and ABA patterns of suppletion, and the $ABC_I$ pattern. In §5.3.2 of his book, Bobaljik proposes an analysis that invokes cyclicity domains which accounts for the attested and unattested data. This analysis requires three things: (a) the assumption that the comparative and superlative heads are cyclic nodes, (b) a Cyclic Condition, and (c) a Suspension Condition. I outline the analysis here.

It is traditionally assumed that Spell Out occurs cyclically, starting from the bottom of the structure and working up (41) (Mascaró 1976; Chomsky 2001; Bobaljik 2000). The trigger for Spell Out is a cyclic node (Marantz 2007; Embick & Marantz 2008; Newell 2008; Embick 2010; Bobaljik 2012). Cyclic nodes are assumed to be category-defining nodes (and likewise, category-defining nodes are assumed to be cyclic).

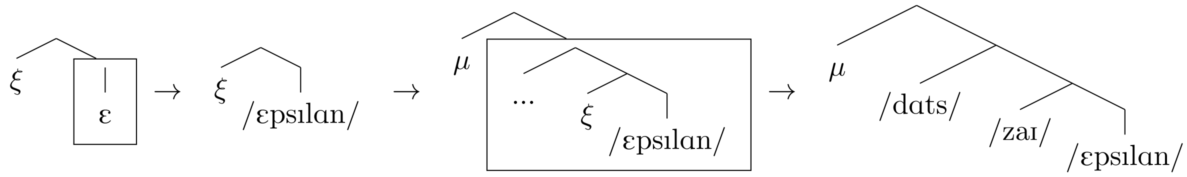
(41) *The Cyclic Condition* (Bobaljik 2012:152)

a. A cyclic node triggers Spell Out of its complement; Spell Out includes rules of exponence.

b. A node that has been spelled out is inaccessible to further application of rules of exponence.

In essence, the Cyclic Condition states that when a cyclic node merges into a tree, its complement is spelled out, which renders the complement's syntactic information inaccessible for future rounds of Spell Out. The Cyclic Condition is illustrated with the trees in (42). In these trees, the cyclic nodes are $\mu$ and $\xi$.

(42) *An abstract tree*




When ɛ's mother merges with $\xi$, $\xi$ triggers Spell Out of ɛ. The feature ɛ is then replaced by phonological material. The structure [$\xi$ [/ɛpsɪlɑn/]] merges with some non-cyclic material (...) and then $\mu$, which triggers Spell Out of $\xi$ and the non-cyclic material that c-commands it. As ɛ has already been spelt out, it is inaccessible to further rules of exponence (Bobaljik 2000; Embick 2010).

The Cyclic Condition rules out the ABC, AAB and ABA patterns of suppletion, because the adjectival root is spelled out before the superlative head merges into the structure, preventing the superlative head from conditioning the allomorphy of the root. The Cyclic Condition also rules out the $\text{AAA}_{\text{II}}$ and $\text{ABB}_{\text{II}}$ paradigms, because the portmanteau $\beta$ cannot be inserted for [S [C]] when these nodes are spelled out in different cycles. The Cyclic Condition alone is thus too strong. To ensure that the $\text{AAA}_{\text{II}}$, $\text{ABB}_{\text{II}}$ and $\text{ABC}_{\text{II}}$ paradigms can be generated, Bobaljik proposes the Suspension Condition (43).

(43) *The Suspension Condition* (Bobaljik 2012:153)

a. Spell Out of a domain, D, (41a) is suspended, if a rule of exponence *spans* D.

b. A rule *spans* D if it involves X and Y in the configuration $[[\text{X}]_{\text{D}}\ \text{Y}]_{\text{D+1}}$.

I illustrate the Suspension Condition with the Old Irish (Bobaljik 2012:145) and Serbo-Croatian (Bobaljik 2012:106) paradigms for *good* (44) and (45). Starting with Old Irish, if the adjective does not merge with C, it will be spelled out as *maith.* But if it merges with C, C will trigger Spell Out of $\alpha$ because C is a cyclic node. Spell Out of $\alpha$ will be suspended however, because there is a rule of exponence that spans both $\alpha$ and C. If the comparative doesn't merge with S, the comparative structure will be spelled out as *fer.* But if it merges with S, S will trigger Spell Out of its complement, [C [$\alpha$]], because S is a cyclic node. Spell Out will be suspended a second time though, because there is a rule of exponence that spans both [C [$\alpha$]] and S. The superlative will finally spell out as *dech.*

(44) *Old Irish 'good'*

| |
|---|
| dech |
| fer |
| maith |

Old Irish

| Exponents | | |
|---|---|---|
| $\alpha$ | ⇔ | maith |
| [C [$\alpha$]] | ⇔ | fer |
| [S [C [$\alpha$]]] | ⇔ | dech |

(45) *Serbo-Croatain 'good'*

| |
|---|
| naj-bol-ji |
| bol-ji |
| dobar |

Serbo-Croatian

| Exponents | | |
|---|---|---|
| $\alpha$ | ⇔ | dobar |
| $\alpha$ | ⇔ | bol / [C [ __ ]] |
| C | ⇔ | -ji |
| S | ⇔ | naj- |

In Serbo-Croatian the story is much the same, but here Spell Out is suspended by the environment of contextual allomorphy. The adjective spells out alone as *dobar*, but if $\alpha$ merges first with C, C will trigger Spell Out of $\alpha$. Because the environment of the contextual allomorph of $\alpha$ spans both $\alpha$ and C, Spell Out of $\alpha$ will be suspended. It doesn't matter what the structure merges with next, as there are no more rules of exponence that will suspend Spell Out, so [C [$\alpha$]] will spell out as *bol-ji*, accompanied by the prefix *naj-* if it's embedded within the superlative.

We can now give the exponents required to derive the attested paradigms of suppletion in Bobaljik's survey (46).

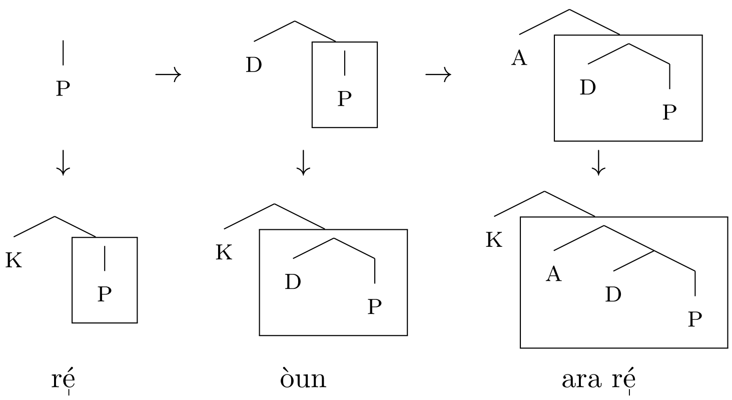
(46) *Exponents for suppletion*

| $AAA_{I}$ | | | $ABB_{I}$ | | | $ABC_{II}$ | | |
|---|---|---|---|---|---|---|---|---|
| $\alpha$ | ⇔ | X | $\alpha$ | ⇔ | Y / [C [ __ ]] | [C [$\alpha$]] | ⇔ | Z / [S [ __ ]] |
| C | ⇔ | $\beta$ | $\alpha$ | ⇔ | X | $\alpha$ | ⇔ | Y / [C [ __ ]] |
| S | ⇔ | $\delta$ | C | ⇔ | $\beta$ | $\alpha$ | ⇔ | X |
| | | | S | ⇔ | $\delta$ | C | ⇔ | $\beta$ |
| | | | | | | S | ⇔ | $\delta$ |

| $AAA_{II}$ | | | $ABB_{II}$ | | |
|---|---|---|---|---|---|
| $\alpha$ | ⇔ | X | $\alpha$ | ⇔ | Y / [C [ __ ]] |
| [S [C]] | ⇔ | $\delta$ | $\alpha$ | ⇔ | X |
| C | ⇔ | $\beta$ | [S [C]] | ⇔ | $\delta$ |
| | | | C | ⇔ | $\beta$ |

If we were to assume that the pronominal nodes A and D are cyclic, this theory of cyclic Spell Out generates exactly the same paradigms of syncretism that were generated by the non-cyclic analysis in §3 with the same exponents that were needed in (22) and (24). I illustrate here with the exponents for Yoruba (47).

(47) *Exponing the Yoruba pronominals*

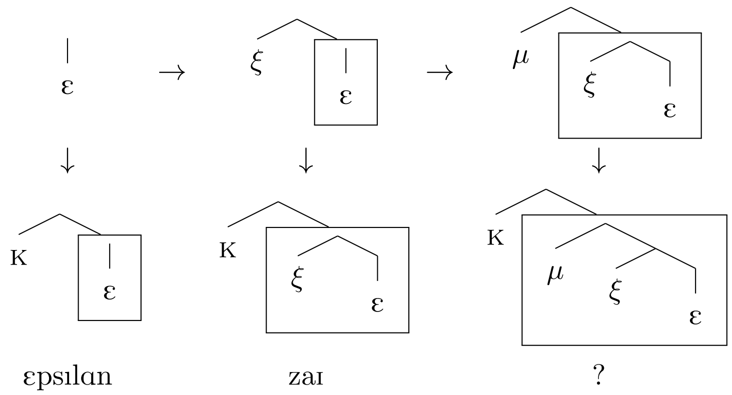



| Exponents | | |
|---|---|---|
| P | ⇔ | ré̩ |
| [D [P]] | ⇔ | òun |
| [A [D]] | ⇔ | ara |

If P merges directly with the Case head, it will spell out as *ré̩*. But if P first merges with D, D will trigger Spell Out of P. However, there is a rule of exponence that spans both P and D, so Spell Out will be suspended. If the tree then merges with K, the diaphor will be spelt out as *òun*. If the diaphor merges with A first, however, A will trigger Spell Out of [D [P]]. Spell Out will be suspended again, due to the third rule of exponence, which spans D and A. When this structure merges with the K head, all three nodes will spell out at the same time, and in accordance with the Maximal Subset Principle, will be realised by the exponents *ara* and *ré̩*, because together these expone all three features; no other combination of exponents achieves this.

As was the case with the non-cyclic analysis, it is impossible to generate a true ABA syncretism pattern in this system. Consider the tree in (48) and its exponents. If [ε] merges with K and is spelled out alone, it will be realised as /ɛpsılɑn/. But if it merges first with $\xi$, Spell Out will be delayed, because the rule of exponence for [$\xi$ [ε]] spans both $\xi$ and ε. This exponent will spell out the structure if [$\xi$ [ε]] then merges with K, giving us /zaı/.

(48) *Another hypothetical pronominal tree, demonstrating *true ABA patterns*




| Exponents | | |
|---|---|---|
| ε | ⇔ | εpsılɑn |
| [ξ [ε]] | ⇔ | zaɪ |
| *and one of* | | |
| [μ [ξ [ε]]] | ⇔ | mju |
| [μ [ξ]] | ⇔ | mju |
| μ | ⇔ | mju |

If a true ABA pattern is to materialise, when [ξ [ε]] merges with $\mu$, ε must be exponed as /εpsılɑn/, and $\xi$ must fail to be exponed. However, this can never happen, because there is no combination of exponents that can derive this. If the exponent for [$\mu$ [$\xi$ [ε]]] is used, /mju/ will expone the entire tree; if the exponent for [$\mu$ [$\xi$]] is used, the tree will be spelled out as /mju εpsılɑn/; if the exponent for $\mu$ is used the result will be /mju zaɪ/; and if there is no exponent that realises $\mu$ at all, the exponent for [$\xi$ [ε]] will win. Hence, a cyclic analysis in which A and D are cyclic nodes and exponents can spell out non-terminal nodes generates the pseudo-ABA pattern of syncretism found in Babanki, Malayalam and Yoruba, but fails to generate true ABA patterns.

## 5 Establishing their status: A and D are not cyclic nodes

I have shown that the pseudo-ABA patterns of syncretism can be accounted for in an analysis in which A and D are not cyclic nodes (§3), and also in one in which they are (§4). In this section, I conclude the paper by presenting the puzzle and analysis of variable exponence (Middleton 2020; *forthcoming*), a problem which is (a) independent of the problem of pseudo-ABA patterns of syncretism, and (b) only compatible with the analysis of pseudo-ABA patterns in which A and D are not cyclic nodes.

### 5.1 Variable exponence

The pronominal forms of Peranakan Javanese of Semarang (PJS) overlap in their possible interpretations (Cole *et al* 2007; 2015). The relevant examples are given in (49), in which *awake dheen dhewe* and *awake dheen* are both able to be used as the anaphor, and (50), in which *awake dheen* and *dheen* are both able to be used as the diaphor. Cole *et al* 2007 report that there is no syntactic or semantic predictor for the variation; the trigger must be pragmatic or sociolinguistic.

(49) *Anaphoric interpretations* (Cole *et al* 2007:25;27)

a. Tono ketok **awake dheen dhewe** nggon kaca, Siti yaya
   Tono see AWAKE DHEEN DHEWE in mirror Siti also

b. Tono ketok **awake dheen** nggon kaca, Siti yaya
   Tono see AWAKE DHEEN in mirror Siti also

c. 'Tono$_i$ saw himself$_i$ in the mirror and Siti did too.'
   → *Tono λx (x saw x in the mirror) and Siti λy (y saw y in the mirror)*

(50) *Diaphoric interpretations* (Cole *et al* 2007:26;24)

a. Tono ngomong nek Bowo ketok **awake dheen** nggon kaca, Siti yaya.
Tono say C Bowo see **AWAKE DHEEN** in mirror Siti also

b. Tono ngomong nek Bowo ketok **dheen** nggon kaca, Siti yaya.
Tono say C Bowo see **DHEEN** in mirror Siti also

c. 'Tono$_i$ said that Bowo saw him$_i$ in the mirror and Siti did too.'
→ *Tono* $\lambda x$ *(x said Bowo saw x) and Siti* $\lambda y$ *(y said Bowo saw y)*

Middleton (2020; *forthcoming*) observes that this variation is unexpected if one assumes the Maximal Subset Principle, since more highly specified exponents should always be inserted when competing for a position with a less specified exponent. Cases of variable exponence in which one exponent spells out a proper subset of the features of the other have been found in several unrelated languages (e.g. Malay (Cole & Hermon 2005), Yoruba (Adesola 2006), various dialects of English (Nevins & Parrott 2010)). In order to explain the interpretive overlaps of these exponents, Middleton reasons, there must be some mechanism that can circumnavigate or neutralise the Maximal Subset Principle. The mechanism Middleton adopts is Optional Impoverishment, from Nevins & Parrott 2010, whereby rules of impoverishment apply optionally (51) (Middleton 2020; *forthcoming).*

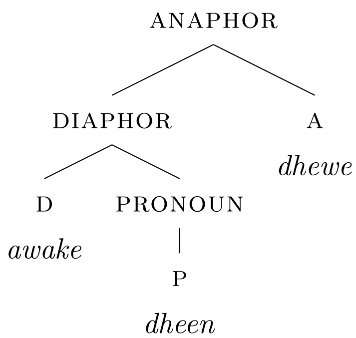
(51) *Optional Impoverishment*
Impoverishment rules enact a structural change only probabilistically, rather than deterministically, when their structural description is met.

That is to say, rules of impoverishment do not have to apply whenever their structural description is met; whether or not they are invoked depends on morphosyntax-external factors, such as sociolinguistic or pragmatic circumstances.[17]

The PJS pronominal tree is given in (52a), with the relevant exponents given in (52b).

(52) *The pronominal paradigm of PJS*

a.




b.

| *Exponents* | | |
|---|---|---|
| A | ⇔ | dhewe |
| D | ⇔ | awake |
| P | ⇔ | dheen |

Impoverishment rules apply to syntactic structures after Spell Out and before Exponent Insertion at PF. To account for the PJS data, two impoverishment rules are required, one to delete A (allowing insertion of *awake dheen* for the anaphor), and one to delete D (which allows for the insertion of *dheen* for the diaphor). However, if these impoverishment rules are allowed to apply at random, havoc will ensue. For example, if D is deleted but the other nodes of the anaphoric tree remain intact, the predicted pronominal form would be *dheen dhewe* (52b). To constrain PJS's optional rules of impoverishment such that only the attested overlaps are possible, Middleton proposes firstly that the rules are ordered (53), and secondly that the pronominal structures are subject to the Russian Doll Deletion Constraint (54), (adapted from Ackema & Neeleman 2018).

[17]An impoverishment rule can, of course, apply 100% of the time, which accounts for occasions when impoverishment rules appear to be deterministic.

(53) *PJS Optional Impoverishment Rules, (a) > (b)*[18]

a. $^{\%}$D → ↯ b. $^{\%}$A → ↯

(54) *The Russian Doll Deletion Constraint*
Only the outermost layer of the structure is available for impoverishment.

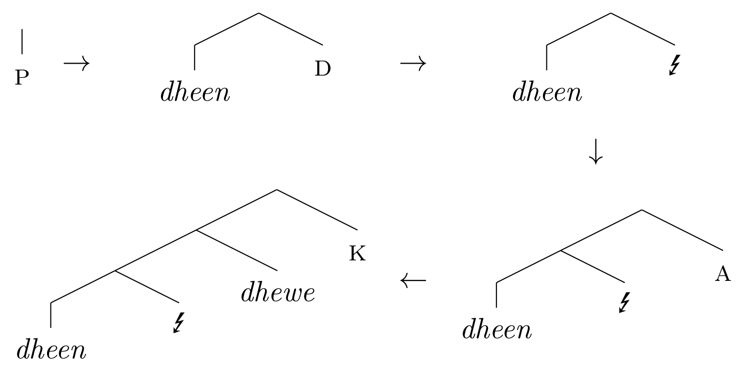
Middleton's analysis captures the PJS data exactly. If we begin with the structure of the anaphor, [A [D [P]]], and neither of the impoverishment rules apply, the exponent will be *awake dheen dhewe.* If the first impoverishment rule applies, (53a), nothing will happen, due to the Russian Doll Deletion Constraint. Then (53b) could apply, deleting A and allowing the exponent *awake dheen* for the anaphoric reading.

If we start with the structure of the diaphor, [D [P]], and neither of the impoverishment rules apply, the exponent will be *awake dheen.* But the first rule of impoverishment could apply, (53a), deleting D, and resulting in the diaphor being exponed as *dheen.*

### 5.2 Wrapping up: A and D are not cyclic nodes

It necessarily follows from this analysis of variable exponence that these impoverishment rules apply to syntactic structures *after* the structure has been built and *before* Exponent Insertion at PF. To illustrate why, consider how this would work in an analysis in which A and D are cyclic nodes. The diagram in (55) shows the derivation of the structure of the PJS anaphor.

(55) *Building the PJS anaphor if* A *and* D *were cyclic nodes*




| Exponents | | |
|---|---|---|
| P | ⇔ | *dheen* |
| D | ⇔ | *awake* |
| A | ⇔ | *dhewe* |
| **Impoverishment Rules** | | |
| $^{\%}$D | → | ↯ |
| $^{\%}$A | → | ↯ |

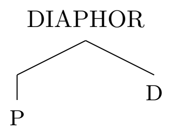
P would first merge with D, and D being cyclic would trigger Spell Out of P: *dheen.* According to the Russian Doll Deletion Constraint, the outermost layer of the tree is available for impoverishment, so the rule of impoverishment that deletes D can apply. The tree, currently composed of the exponent *dheen* and the empty node which hosted D, then merges with A, which is exponed by *dhewe* when the structure merges with the Case head K. This results in the PJS anaphor being spelled out as *dheen dhewe*, which is unattested in PJS. Alternatively, the second rule of impoverishment could apply before the tree merges with K, resulting in the anaphor being exponed by the single morpheme *dheen.* As with the example illustrated in (55), this is unattested in PJS. We are thus forced to conclude that the nodes A and D cannot be cyclic if the optional impoverishment analysis of variable exponence is maintained.

To see that the attested variation is derived in an analysis in which A and D are not cyclic nodes, consider the structures in (56). If these structures are built *before* Exponent Insertion, then PJS's ordered rules of impoverishment (if they apply) can only delete D in the diaphor and A in the anaphor, due to the ordering restriction and the Russian Doll Deletion Constraint.

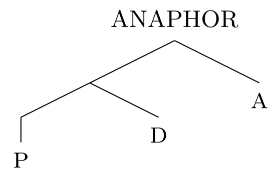
[18] I use the lightning symbol {↯} for impoverishment, and the empty set symbol {∅} for a phonologically null exponent.

(56) *The complete structures of the diaphor and anaphor*

a.




b.




The structures would then be exponed as *dheen* and *awake dheen* respectively. Since these are the attested variations in PJS, this analysis is superior to the one in which A and D are cyclic nodes.

## 6 Conclusion

In conclusion, an analysis that assumes unrestricted phonologically null allomorphy or unrestricted impoverishment overgenerates, allowing all the logically possible patterns of syncretism to appear. An analysis that includes spanned portmanteau exponents generates all and only the attested patterns of syncretism. In this analysis, the pronominal tree spells out when it merges with K(ase) (or some higher node). Pseudo-ABA patterns arise when a spanned exponent for [A [D]] and an exponent for P together spell out more of the pronominal structure than any other combination of exponents.

Spanned portmanteau exponents are compatible with an analysis in which A and D are cyclic nodes, and one in which they are not. However, only the analysis of pseudo-ABA patterns of syncretism in which A and D are *not* cyclic nodes is compatible with the broader analysis of the morphology and morphological behaviour of pronominal forms. The alternative analysis, in which A and D *are* cyclic nodes, is incompatible with the analysis of variable exponence found in pronominal forms, which adopted the notion of optional impoverishment from Nevins & Parrott 2010.

## Declarations

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