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# The AMAR mechanism: nominal expressions in the Bantu languages are shaped by apposition and reintegration

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**Abstract:** Nominal expressions in the Bantu languages have extraordinary typological characteristics. Their word order patterns are extremely diverse and some of the attested patterns are crosslinguistically very rare, or even unique. The same diversity can be found in the number of agreement marker paradigms. Equally remarkable are the prosodic idiosyncrasies found at the level of nominal expressions, especially the existence of prosodic boundaries associated with certain types of adnominal modifiers. Although logically unrelated, I argue that these typological characteristics can be accounted for by a single diachronic scenario here called the AMAR mechanism: a double tendency in the Bantu languages for the emergence of construals in which a nominalized modifier is in apposition to the phrase that contains its semantic head and for such appositional construals to be gradually reintegrated into a single nominal constituent. This paper aims to summarize some of the more remarkable typological characteristics of nominal expressions in the Bantu languages and to lay out the AMAR mechanism as a hypothetical diachronic explanation for many of them.

**Keywords:** agreement; apposition; Bantu languages; historical syntax; prosody; word order

## 1 Introduction

The Bantu languages show an extraordinary range of crosslinguistic and intra-linguistic constructional variation in their nominal expressions. The theoretical interest of this variation has been noted in the domain of word order typology right from the start, with Greenberg's Universal 20 (1963: 87). Greenberg had found "powerful constraints" in the languages of the world on the mutual ordering of

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Demonstrative, Numeral and Adjective when this is fixed. In his sample, these modifiers have to occur in the order DEM NUM ADJ if any or all precede the noun and in the mirror image ADJ NUM DEM if all of them follow. However, Universal 20 also allows the order DEM NUM ADJ among postnominal modifiers, because Greenberg knew it exists in the Bantu language Kikuyu [kik] (Kenya). When Hawkins (1983) reformulated Universal 20 on the basis of a sample of 300 languages, he concluded that no absolute predictions can be made on the mutual ordering of the three modifiers if all of them follow the noun. The presence in his sample of the Bantoid languages Aghem [agq] and Noni [nhu] (both Cameroon) was responsible for this further weakening of Universal 20. They have the orders N ADJ DEM NUM and N DEM {ADJ NUM} respectively.<sup>1</sup>

Nevertheless, the languages of the world show an extremely strong statistical preference for ordering patterns that are iconic or “homomorphic” (Culbertson et al. 2020) in reflecting the differences in scope between types of modifiers. Following Rijkhoff (2008), adnominal modifiers can be divided into five functional types. In increasing order of scope these are: *classifying*, *qualifying*, *quantifying*, *localizing* and *discourse-referential*. For instance, in a complex noun phrase like *these three delightful examples of semantic agreement*, the classifying modifier *of semantic agreement* specifies what kind of examples are denoted. The qualifying modifier *delightful* specifies a property of the classified noun *examples of semantic agreement*. In turn, the quantifying modifier *three* has scope over the qualifying modifier, the classifying modifier and the head noun. Finally, the modifier *these* locates everything in space or discourse and has scope over all the other modifiers. Although the match between functional types of modifiers and word classes is not perfect, classifying and qualifying modifiers can be mapped to adjectives, qualifying modifiers to numerals and localizing and discourse-referential modifiers to demonstratives. Therefore, out of the twenty-four logically possible orders between the four morphosyntactic elements included in Universal 20 only the eight orders in (1) are iconic (Rijkhoff 2008: 800). Based on counts in Dryer (2018), N ADJ NUM DEM is by far the most widely attested patterns in the languages of the world.

- (1)
- |     |     |     |   |     |     |
|-----|-----|-----|---|-----|-----|
| DEM | NUM | ADJ | N |     |     |
|     | DEM | ADJ | N | NUM |     |
|     | NUM | ADJ | N | DEM |     |
|     |     | ADJ | N | NUM | DEM |

---

<sup>1</sup> The Bantoid family comprises the Bantu languages (also called Narrow Bantu) and their closest relatives. The exact delimitation of Narrow Bantu is more a matter of convention than of the application of a clear set of genealogical criteria. Curly brackets around sets of modifiers indicate that their mutual ordering is syntactically free.

DEM	NUM	N	ADJ	
	DEM	N	ADJ	NUM
	NUM	N	ADJ	DEM
		N	ADJ	NUM DEM

A survey of the mutual ordering of these modifiers in the Bantu languages when they are all in postnominal position shows that every single logical possibility is attested (Table 1). In other words we find that every non-iconic, crosslinguistically rare pattern is exemplified in Narrow Bantu, despite this being a low-level genealogical unit with a time depth of only four to five thousand years (Bostoen and Van de Velde 2019: 4).<sup>2</sup>

**Table 1:** Logically possible mutual orderings of numerals, adjectives and demonstratives and an example of a doculect where they are mentioned as the default word order pattern.

N ADJ NUM DEM	Chichewa [nya] (Bentley and Kulemeka 2001: 21)
N ADJ DEM NUM	Ngazidja [zɗj] (Patin et al. 2019: 602)
N NUM ADJ DEM	Chimpoto [mpa] (Botne 2019: 709)
N NUM DEM ADJ	Mbugwe [mgz] (Wilhelmsen 2019: 559)
N DEM ADJ NUM	Ikoma [ntk] (Aunio et al. 2019: 516)
N DEM NUM ADJ	Kikuyu [kik] (Mugane 1997: 39)

In order to make sense of these violations of his principle of iconicity, Rijkhoff suggests that Bantu nominal expressions may be non-integral, i.e., that semantic modifiers of a noun are not in a direct construction with that noun, but rather in a distinct phrase at the level of the clause, in apposition with the semantically modified noun (Rijkhoff 2002: 274–275, 2008: 804). However, Dryer (2018: 827) points out that there is usually no independent evidence for the appositional nature of the constructions that violate Rijkhoff’s principle of iconicity. Dryer’s skepticism proves to be valid when we consider the Kikuyu language, whose default N DEM NUM ADJ order is radically non-iconic, yet synchronically clearly does not involve apposition. As indeed pointed out by Mugane (1997: 39), every departure from the default word order asks for special comma intonation. In other

<sup>2</sup> Some languages also allow certain modifiers to be in prenominal position. We will come back to that in Section 3. The absence of curly brackets in Table 1 does not necessarily imply the absence of word order flexibility in the represented languages. Information on complex noun phrases is often based on elicitation. Grammarians may not verify the possibility of alternative word orders and consultants may be reluctant to produce pragmatically marked orderings out of context. Moreover, dialectal or even idiolectal variation is likely to exist.

words, it is the iconic word order that would require an intonational pattern that is indicative of apposition.

I argue that Rijkhoff's and Dryer's seemingly contradictory observations are both valid for the Bantu languages, in that the typologically unusual word order patterns are due to a scenario of morphosyntactic change that involves the emergence of appositional structures which are subsequently reintegrated into more coherent noun phrases. I will call this scenario the AMAR mechanism, short for *Adnominal Modifier Apposition and Reintegration*. Independent evidence for the AMAR mechanism is found in other typologically unusual characteristics of Bantu nominal expressions that are logically independent but partially correlated. One such characteristic is the recurrent presence of determiner-like morphemes on adnominal modifiers. A related one is the proliferation of paradigms of agreement markers. A third relevant typological peculiarity is the presence of strong prosodic boundaries within nominal expressions. These characteristics will be discussed in the following sections. Section 2 explains how the AMAR mechanism works. Section 3 elaborates on word order. The idea that erstwhile nominalizers are reinterpreted as agreement markers is further explored in Section 4 on agreement within the noun phrase, where I will argue that the existence of multiple paradigms of agreement markers can be accounted for by the AMAR mechanism and that this might also be true for the presence of semantic agreement on the majority of adnominal modifiers. Section 5, finally, will look at prosodic boundaries within nominal expressions as vestiges of appositional structures.

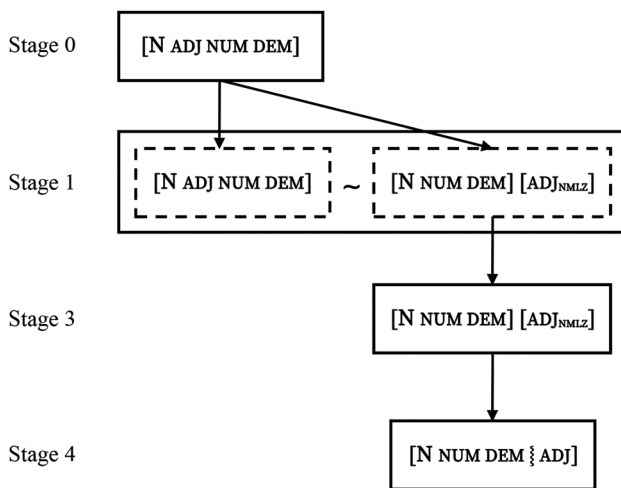
## 2 The AMAR mechanism

The AMAR mechanism is made up of three tendencies that feed into each other and thus form stages in a scenario of morphosyntactic change. The first is the emergence of a construal for modifiers as an alternative to their adnominal use in an integral noun phrase, viz. as independent referring expressions in apposition to the phrase that contains the head noun. Such modifiers are marked for their referring use by formal means such as the addition of a determiner (or a zero head which then asks for a determiner, depending on one's theoretical preferences). This tendency leads to the existence of alternative construals paraphrasable in English as 'the big men' versus 'the men, the big ones'. The second tendency is for some such appositional structures to conventionalize and generalize, replacing the adnominal use of the modifier. The third tendency is for the appositional structure to be gradually reinterpreted as a single integral noun phrase.

The first stage of the AMAR mechanism is discrete and relatively easily observable. The second and third stages are incremental and potentially

overlapping. They give rise to constructions that cannot be straightforwardly typologized as either having or lacking a rigid phrase structure (Louagie and Reinöhl this issue). Evidence for AMAR is found in formal remnants of erstwhile appositional structures. Figure 1 is a schematic representation of the AMAR scenario applied to an adjective. The symbol § between the demonstrative and the adjective in Stage 4 symbolizes any traces of the former appositional structure, such as a prosodic boundary or the altered shape of the agreement prefix of the adjective due to fusion between a nominalizer and the original agreement prefix.

An illustration of Stage 1 can be found in Bemba [bem] (Zambia, DRC, Tanzania, Botswana). The original order in Bemba between a cardinal number and a qualifying adjective is the iconic *ADJ NUM* (2a). The reverse order is only possible if the adjective has been nominalized by means of an agreeing prefix called *augment* in Bantu linguistics, as in (2b).<sup>3</sup> Otherwise, *NUM ADJ* order is ungrammatical (2c).



**Figure 1:** The AMAR mechanism.

<sup>3</sup> The augment will be further discussed in Section 3.1. The following abbreviations are used in examples: 1, 2, 3 ... noun classes; *APR* Adjectival Prefix; *AUG* augment; *CAUS* causative; *CON* connective ( $\approx$ genitive) relator; *FV* final vowel (a TAM suffix); *DEM* demonstrative; *EPT* Numeral Prefix; *LOC* locative; *NEG* negative; *NMLZ* nominalizer; *NPT* nominal prefix; *OPR* Object Prefix; *PERF* perfect; *POSS* possessive; *PPT* Pronominal Prefix; *PRO* personal pronoun; *PST* past; *RPR* Relative Prefix; *TAM* tense-aspect-modality marker; *VPR* verbal prefix.

(2) Bemba<sup>4</sup>

- a. *à-báá-ntù*                      *bà-kúlú*    *bà-bìlì*  
 AUG<sub>UR</sub>-NPR<sub>2</sub>-person    NPR<sub>2</sub>-big    NPR<sub>2</sub>-two  
 ‘the two big men’
- b. *à-báá-ntù*                      *bà-bìlì*                      *á-bà-kúlú*  
 AUG<sub>2</sub>-NPR<sub>2</sub>-person            NPR<sub>2</sub>-two                      AUG<sub>2</sub>-NPR<sub>2</sub>-big  
 ‘the two big men’ (lit. ‘the two men, the big ones’)
- c. \**à-báá-ntù bà-bìlì bà-kúlú*  
 (Kasonde 2009: 167)

There are strong arguments for analyzing the Bemba construction in (2b) as appositional. First, the adjective has an augment in this particular construction, versus elsewhere. Second, the augment can be used in contemporary Bemba to derive a referring expression ‘the *x* one’ from a modifying adjective *x*. And third, whenever the adjective has the augment, it has to be placed after other modifiers of the noun. The adjective’s final position and its augment are therefore due to and explainable by its appositional nature in (2b).

In contrast, there are constructions in Bantu languages where adjectives are also in final position of nominal expressions and/or have an augment, but where the presence versus absence of an augment does not correlate with a special, final position. Digo [dig] (Kenya, Tanzania), for instance, has the order DEM N NUM ADJ. The phrase final position of the adjective is non-iconic and crosslinguistically rare, but in Digo it is its default position. There is no alternative construction and therefore no possible correlation with the presence of a nominalizer (Nicolle 2013). In Nyakyusa [nyy] (Malawi, Tanzania), word order among adnominal modifiers is largely free, but adjectives are preferably in final position and normally have an augment (3). Again, there is no contrast between a construction with a phrase-final augmented adjective and a construction with a non-phrase final, non-augmented adjective.

## (3) Nyakyusa

- ũ-n-yambala*    *jũ-mo*                      *u-n-dondo*                      *fijjo*  
 AUG<sub>1</sub>-NPR<sub>1</sub>-man    NPR<sub>1</sub>-one                      AUG<sub>1</sub>-NPR<sub>1</sub>-poor                      very  
 ‘one very poor man’  
 (Lusekelo 2009: 320)

The absence of an allostruct with a non-final, augmentless adjective means that the Nyakyusa construction in (3) is no longer in stage 1, i.e., that at one point the appositive structure has conventionalized. However, here, as in many other cases,

<sup>4</sup> I am grateful to Nancy Kula for having confirmed the well-formedness of Examples (2a)–(2b).

it is hard to determine whether the structure is still best analyzed as two referring expressions in apposition (stage 2) versus one, more formally integrated nominal expression (stage 3). This is partly due to a lack of detailed grammatical analyses in this domain, e.g., taking prosody into account, but partly also to the fact that formal integration is an incremental process.

I do not know what motivates the emergence of the appositional structure in stage 1, nor what the semantic-pragmatic differences are between the integral and the appositional allostructs at that stage, if any. The few available analyses remain vague and point in different directions. One possibility is that adnominal adjectives are used non-selectively as qualifying modifiers, whereas nominalized and apposed adjectives are initially used selectively as localizing modifiers.<sup>5</sup> This distinction is sometimes characterized in terms of emphasis (i.e., contrastivity?), sometimes in terms of definiteness. For instance, Ashton et al. (1954: 387) report on the existence of allostructs in Ganda [lug] (Uganda) similar to those illustrated for Bemba in (2a–b), but involving a numeral. When a numeral and a qualifying adjective are combined, the default construal has N<sub>NUM</sub> ADJ order and no augment on the numeral (4a). When the numeral follows the adjective, it acquires an augment, and the augment of the adjective apparently becomes optional (4b). This construction is said to be used “to emphasize the numeral.” Hyman and Katamba (1991: 41) explicitly state that the presence of the augment on numerals often results in a definite interpretation, and this idea is also reflected in the English translation of (4b) provided by Ashton et al.

(4) Ganda

- a. *e-m-buzi*                      *bbiri*                      *e-n-nungi*  
 AUG<sub>10</sub>-NPR<sub>10</sub>-goat    10.two    AUG<sub>10</sub>-APR<sub>10</sub>-fine  
 ‘two fine goats’
- b. *e-m-buzi*                      *(e-)n-nungi*                      *e-bbiri*  
 AUG<sub>10</sub>-NPR<sub>10</sub>-goat    (AUG<sub>10</sub>-)APR<sub>10</sub>-fine    AUG<sub>10</sub>-10.two  
 ‘the two fine goats’  
 (Ashton et al. 1954: 387)

No difference in definiteness is reported by Rascher (1958; as cited by Wald 1973: 253), for the Haya [hay] (Tanzania, Uganda) examples in (5), where the augmented adjective (5b) is said to be emphatic, the augment fulfilling the function of stress in English.

<sup>5</sup> See Idiatov (forthcoming, Section 6.5.1.2) for a similar proposal regarding the function of the nominalizer *mà-* in the Jarawan Bantu language Mbula [mbu] (Nigeria).



## (5) Haya

- a. *o-mu-ntu*                      *mu-rungi*  
 AUG<sub>1</sub>-NPR<sub>1</sub>-person    NPR<sub>1</sub>-beautiful  
 ‘the gòod lǎoking **pèrson**’
- a. *o-mu-ntu*                      *o-mu-rungi*  
 AUG<sub>1</sub>-NPR<sub>1</sub>-person    AUG<sub>1</sub>-NPR<sub>1</sub>-beautiful  
 ‘the **góod-lòoking** pèrson’  
 (Wald 1973: 253; citing; Rascher 1958)

But Haya can be used to illustrate how difficult it is to interpret the statements available in the literature on the conditions of use of augments on modifiers. Wald notes that his own native speaker consultant generally omits the augment on adjectives but accepts its addition when explicitly asked. This same native speaker found it impossible to describe any difference in meaning or use between augmented and unaugmented adjectives. In sharp contrast, according to Chagas (1977: 36), the adjective usually has to be augmented whenever the head noun is, which is in most cases. This may indicate that the use of the augment depends strongly on the discourse and syntactic context, limiting the usefulness of elicitation. In more complex nominal constructions, the correlation between having an augment and being in final position (or apposed?) appears to be clear, though. According to Byarushengo (1977), the default order in Haya is N NUM DEM ADJ when these three modifiers co-occur, as in (6). Based on this description, Haya is the only language in Dryer’s worldwide sample of 576 languages that has this order (Dryer 2018: 822).<sup>6</sup>

## (6) Haya

- e-n-jú*                      *z-anje*                      *i-bily’*                      *êz’*                      *é-zi-loge*  
 AUG<sub>10</sub>-NPR<sub>10</sub>-house    PPR<sub>10</sub>-my                      EPR<sub>10</sub>-two                      10.these                      AUG<sub>10</sub>-APR<sub>10</sub>-good  
 ‘these two good houses of mine’  
 (Byarushengo 1977: 13)

Interestingly, an older description of Haya states that an adjective cannot be interpreted as a simple qualifier when it occurs together with a determiner. In such cases, the adjective necessarily receives a contrastive-selective reading (Kuijpers 1922: 142). Since in (7a) the adjective ‘beautiful’ is preceded by the possessive modifier ‘of the chief’, its use implies the existence of alternative referents of which the intended one is selected by the adjective ‘beautiful’. In order to avoid this reading and add a simple qualification, the adjective has to be used predicatively as an afterthought, for instance as in (7b).

<sup>6</sup> We saw in Table 1 that this order is also attested in Mbugwe.

## (7) Haya

- a. *w-aa-bona e-n-ju y' o-mw-aami e-nungi?*  
 VPR<sub>2SG</sub>-PST-see AUG<sub>9</sub>-NPR<sub>9</sub>-house CON<sub>9</sub> AUG<sub>1</sub>-NPR<sub>1</sub>-chief AUG<sub>9</sub>-9.beautiful  
 ‘Have you seen the **beautiful** house of the chief?’
- b. *w-aa-bona e-n-ju y' o-mw-aami, (okw e-li)*  
 VPR<sub>2SG</sub>-PST-see AUG<sub>9</sub>-NPR<sub>9</sub>-house CON<sub>9</sub> AUG<sub>1</sub>-NPR<sub>1</sub>-chief, how VPR<sub>9</sub>-be  
*nungi?*  
 9.beautiful  
 ‘Have you seen the house of the chief, (how) it is beautiful?’  
 (Kuijpers 1922: 142)

This means that in the lect described by Kuijpers, the adjective has lost the ability to combine with a determiner in an integral noun phrase where it would lack an augment and be in immediately postnominal position. In other words, the appositional construal of a qualifying adjective has become obligatory in the presence of a localizing modifier. At the same time, syntactic reintegration has not yet taken place and the contrastive-selective reading of apposed modifiers remains active. Since Byarushengo (1977) makes no such observations regarding Example (6), it is possible that the two sources describe different lects, and since the descriptions are more than fifty years apart, it is possible that their differences reflect language change.<sup>7</sup>

Where the preceding facts suggest a localizing-selective use of apposed modifiers, versus a quantifying or qualifying use in any alternative adnominal construal, Givón claims that augmented adjectives are used non-restrictively in Bemba examples such as (2b) (1974: 132–135). Still according to Givón, this same non-restrictive use of adjectives is signaled by sentence-final position in Ganda, which can give rise to discontinuous nominal expressions (8).

## (8) Ganda

- a. *o-mu-sajja o-mu-rungi agenze*  
 AUG<sub>1</sub>-NP<sub>1</sub>-man AUG<sub>1</sub>-NP<sub>1</sub>-good left  
 ‘The good man left.’ (restrictive)
- b. *o-mu-sajja agenze o-mu-rungi*  
 AUG<sub>1</sub>-NP<sub>1</sub>-man left AUG<sub>1</sub>-NP<sub>1</sub>-good  
 ‘The man left, the good one.’ (non-restrictive)  
 (Givón 1974: 135)

<sup>7</sup> Another relevant difference between the two descriptions is that Kuijpers’ Haya does not have obligatory augment harmony between a noun and an adjective. A noun with an augment can be modified by an augmented or augmentless adjective (Kuijpers 1922: 140).

To summarize, more detailed descriptive work is needed in order to understand what motivates the emergence of the appositional structure in stage 1. Another aspect of the AMAR mechanism that needs to be elaborated concerns the possible existence of an *AMARizability hierarchy*, with adjectives seemingly at the top and possessive pronouns at the bottom. The rationale behind such a hierarchy could be that modifiers that are least inherently selective, such as adjectives, are most likely to be marked for a selective usage by nominalization and apposition. We will see some evidence for such a hierarchy in the following sections. Another current unknown is whether there is evidence for the presence of an AMAR-like mechanism in other languages of the Niger-Congo phylum, and, if not, which grammatical or pragmatic property specific to the Bantu languages triggers the mechanism in Bantu.

### 3 Word order: variation, freedom and discontinuity

No systematic comparative study of word order patterns in the Bantu noun phrase has been carried out, but even a superficial look reveals an impressive amount of inter and intra linguistic variation along several dimensions, such as the position of modifiers with respect to the head noun, the mutual ordering of postnominal modifiers with fixed word order, flexibility and contiguity. For the sake of exhaustiveness, this section discusses aspects of word order variation that have not been discussed in the previous sections, because they are not clearly linked to the AMAR mechanism (3.1). We will then look at the position of possessive pronouns, which are not usually included in typological work on NP internal word order but tend to be in a deeply anti-iconic position in the Bantu languages (3.2).

#### 3.1 Patterns of word order variation across languages and constructions

Although certain modifiers can precede the noun in some languages (see below), most adnominal modifiers follow the noun in the Bantu languages. The order of postnominal modifiers can be rigid or flexible. Flexibility is usually restricted to a subset of modifiers and combines with a fixed position in phrase-final and/or immediately postnominal position for another modifier. In Basaa [bas] and Eton [eto] (Cameroon), for instance, if a possessive pronoun, an adjective, a genitive, a cardinal number and a demonstrative are all in postnominal position, the mutual

ordering of the first four is syntactically free, while the demonstrative has to come at the end (9)–(10).

- (9) Basaa N {POSS, ADJ, NUM, GEN} DEM  
Hyman (2003)

- (10) Eton
- a. N {Poss, Num, Gen} Dem
  - b. *mèpúb mé ηkúnkúamá mé<sup>+</sup> bá*  
*mà-púb mà=ñ-kúnkúamá mà-bă*  
NPR<sub>6</sub>-field CON<sub>6</sub>=NPR<sub>3</sub>-chief PPR<sub>6</sub>-two
  - c. *mèpúb mé<sup>+</sup> bá mé ηkúnkúamá*  
*mà-púb mà-bă mà=ñ-kúnkúamá*  
NPR<sub>6</sub>-field PPR<sub>6</sub>-two CON<sub>6</sub>=NPR<sub>3</sub>-chief  
'the two fields of the chief'  
(Van de Velde 2008: 227)

In Orungu [mye] (Gabon), word order among adnominal modifiers is mostly fixed (11a). However, in the presence of a cardinal number the mutual ordering of adnominal modifiers is free, except that the possessive pronoun remains obligatorily in immediately postnominal position (11b) (Van de Velde 2019: 261–262).

- (11) a. N POSS ADJ DEM  
b. N POSS {NUM, ADJ, DEM}

Such cross-constructural variation in word order rigidity has also been reported for the Machame language [jmc] (Tanzania). According to Rugemalira (2007: 139–141), the mutual ordering of a demonstrative, a possessive pronoun, a cardinal number, an ordinal number and the quantifier 'all' is as in (12a), showing partial flexibility. When an adjective is added, the order between the quantifiers becomes more rigid (12b).<sup>8</sup>

- (12) a. N DEM POSS {NUM, ORD, 'all'}  
b. N DEM POSS (ADJ) NUM (ADJ) ORD (ADJ) 'all'

Discontinuous nominal expressions appear to be very rare. I only found examples in descriptions of Ganda (see Example (6b)), Chichewa and Tunen and do not know how frequent they are in these languages. In Chichewa [nya] (Malawi, Zambia,

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<sup>8</sup> It is not entirely clear from Rugemalira's description whether the more rigid ordering is due to the addition of the adjective, to the increased complexity of the noun phrase or to a combination of both. As far as I understand, the adjective can be put anywhere between POSS and 'all' in (12b), but this is not entirely clear either. What matters is that there are cross-constructural differences in word order rigidity.

Mozambique), they can be used to signal a contrastive topic interpretation on the part of a nominal expression that is left-dislocated (Mchombo et al. 2005). Discontinuous expressions are subject to a number of constraints in Chichewa. First, one part of them always has to be in clause-initial position. Second, chunks that consist of more than one word are subject to the rigid word order found in integral noun phrases. In (13c) and (13e), for instance, the order of the demonstrative and the adjective cannot be switched. It is identical to the order of those elements in the integral noun phrase in (13a). Third, only the core grammatical relations of subject and primary object can be expressed by means of a discontinuous nominal expression and discontinuous nominal expressions have to be indexed on the verb by means of a prefix, underlined in (13b)–(13f). The examples in (13) show every possible construal of the nominal expression ‘these foolish hunters’ in primary object position.

(13) Chichewa

- a. *Njúchĩĩ*    *izi*            *zi-ná-lúm-á*    *álenje*    *awa*  
 10.bees    10.these    10-PST-bite-FV    2.hunter    2.these  
*ópúsa*    N DEM ADJ  
**2.foolish**  
 ‘These bees bit these foolish hunters.’ N DEM ADJ
- b. *awa njúchĩĩ izi zi-ná-wá-lúm-a álenje ópúsa*    DEM (...) N ADJ
- c. *álenje njúchĩĩ izi zi-ná-wá-lúm-a awa ópúsa*    N (...) DEM ADJ
- d. *álenje awa njúchĩĩ izi zi-ná-wá-lúm-a ópúsa*    N DEM (...) ADJ
- e. *awa ópúsa njúchĩĩ izi zi-ná-wá-lúm-a álenje*    DEM ADJ (...) N
- f. *álenje ópúsa njúchĩĩ izi zi-ná-wá-lúm-a awa*    N ADJ (...) DEM

Tunen [tvu] (Cameroon), spoken in the extreme North-West of the Bantu area, is the only Bantu language with SOV basic clausal syntax, versus SVO in other Bantu languages. According to Mous (2003: 305), a modifier of the last preverbal argument can be placed after the verb to signal contrastive focus on that modifier (14).

- (14) *mè-ná*    *ìmit̩*            *yè*    *mʷənĩfĩ*    *ĩndĩ*    *mè-ńẹ́*    *ò*    *hè-l̩bát̩*  
 VPR<sub>1SG</sub>-PST    9.calabash    CON<sub>9</sub>    6.water    give.PST    NPR<sub>9</sub>-big    LOC    NPR<sub>19</sub>-child  
 ‘I gave the BIG water calabash to the child.’

Many languages scattered throughout the Bantu domain allow some types of modifiers to be in prenominal position, either optionally or obligatorily, depending on the language and the modifier. Typically, these are demonstratives (Van de Velde 2005), possessive pronouns, ‘each, every’ (Rugemalira 2007: 138) and/or ‘other’. Interestingly, the set of modifiers that can occur in prenominal position more or less coincides with the set of modifiers that are closest to the head noun when they follow it, suggesting that they are most resistant to undergoing the

AMAR mechanism crosslinguistically. This may have something to do with their inherently selective semantics.

Prenominal demonstratives are relevant for the AMAR mechanism in that they are at the origin of the augment, a morpheme that has already been mentioned in Section 2, and that will frequently come back in the remainder of this paper. The augment is a prefix that precedes the class prefix of nouns and whose shape usually varies with it. The conditions of use of augments are language specific and tend to be syntactically determined (de Blois 1970; Van de Velde 2019: 247–255). In general, it is easier to list the environments in which the augment is absent than those in which its presence is required (Hyman and Katamba 1993). The function of the augment that is most relevant for the AMAR mechanism is that it can be used in many languages to nominalize an adnominal modifier, much like articles in languages such as French and Dutch. This is illustrated with Nande data [nnb] (DRC, Uganda) for a possessive pronoun (15b) and a qualifying adjective (15d).

(15) Nande

- a. *ǝ-mǝ-kirá*      *ɣw-á-yɔ*  
 AUG<sub>3</sub>-NPR<sub>3</sub>-tail      PPR<sub>3</sub>-CON-PRO<sub>9</sub>  
 ‘his tail’ (possessor of class 9)
- b. *ǝ-ɣw-á-yǝ*  
 AUG<sub>3</sub>-PPR<sub>3</sub>-CON-PRO<sub>9</sub>  
 ‘his one’
- c. *ǝ-mǝ-tí*      *mù-kúhí*  
 AUG<sub>3</sub>-NPR<sub>3</sub>-tree      NPR<sub>3</sub>-short  
 ‘the short tree’
- d. *ǝ-mù-kúhí*  
 AUG<sub>3</sub>-NPR<sub>3</sub>-short  
 ‘the short one’  
 (Valinande 1984: 642, 709, 714)

According to the AMAR hypothesis, augments that appear on adnominal modifiers in an integral noun phrase can point to formerly appositional structures that involved nominalized modifiers. It is generally assumed in Bantu studies that the augment in individual Bantu languages is a reflex of a Proto-Bantu augment. However, there are many reasons to see the augment as a *type* of morpheme, which can emerge and disappear, rather than as a reflex of a single morpheme inherited from Proto-Bantu (Van de Velde 2019: 254–255). Several Bantu languages have different morphemes that would each individually be recognized as augments had they not co-occurred in a single language. Thus, Persohn (2017: 44) states that Nyakyusa nouns can take either a mostly optional vocalic augment (16a) or a Pronominal Prefix that has an emphatic function (16b).

- (16) a. *ʊ-lw-ala*  
 AUG<sub>11</sub>-NPR<sub>11</sub>-grindstone  
 ‘the grindstone’
- b. *lʊ-lw-ala*  
 PPR<sub>11</sub>-NPR<sub>11</sub>-grindstone  
 ‘the very grindstone’ or ‘just the grindstone’

In my view, there is no reason for calling only one of these an augment. In what follows, I will use the term in its broadest possible sense to include all morphemes that can be used to nominalize an adnominal modifier.

### 3.2 The position of possessive pronouns

So far, we have not discussed a recurrent phenomenon among the typologically unusual fixed word-order patterns of the Bantu languages, viz. the immediately postnominal position of possessive pronouns in very many languages. The word order patterns in (17) include the possessive pronoun, which is normally omitted in the typological literature on NP-internal word order. As can be seen, the possessive pronoun is in immediately postnominal position in languages that otherwise differ from each other in the ordering of postnominal modifiers.

- (17) a. Nande: N POSS NUM ADJ DEM  
 (Valinande 1984: 633)
- b. Chimpoto: N POSS NUM ADJ DEM  
 (Botne 2019: 709)
- c. Nkore-Kiga: N POSS DEM ADJ NUM  
 (Taylor 1985: 55)
- d. Ikoma: N POSS DEM ADJ NUM  
 (Aunio et al. 2019: 516)
- e. Haya: N POSS NUM DEM ADJ  
 (Byarushengo 1977: 13)
- f. Mbugwe N POSS NUM DEM ADJ  
 (Wilhelmsen 2019: 559)
- g. Digo: DEM N POSS NUM ADJ  
 (Nicolle 2013: 29, 81)

Possessive pronouns are localizing modifiers, which have scope over classifying, qualifying and quantifying modifiers. According to Rijkhoff (2008: 800), the linear ordering of modifiers tends to iconically reflect their scopal relations, meaning that the recurrent immediately postnominal position of possessive pronouns in the

Bantu languages is deeply anti-iconic. This suggests that possessive pronouns are most resistant to being construed as a nominalized element in apposition, i.e., that it is at the bottom of an apparent AMARizability hierarchy.<sup>9</sup> In the next section we will see that possessive pronouns are most closely syntactically linked to the head noun in terms of agreement as well.

## 4 Agreement

The Bantu languages are well known for their alliterative agreement patterns. Almost every modifier agrees in noun class with the modified noun. In this section I argue that two aspects of noun class agreement within nominal expressions are likely to have been shaped by the AMAR mechanism, most clearly the existence of multiple paradigms of agreement markers (4.1) and perhaps also the ubiquity of semantic agreement (4.2). The phenomenon of “agreement with the neighbor” is an interesting instantiation of non-integrity of nominal expressions, but it is extremely rare in the Bantu languages and not clearly linked to the AMAR mechanism. It is mentioned for the sake of exhaustivity in 4.3.

### 4.1 The origin of paradigms of agreement markers

Proto-Bantu has been reconstructed with five paradigms of agreement prefixes, three of which are relevant for agreement in nominal expressions (Meeussen 1967: 97). They are represented for classes 1–10 in Table 2. The prefix paradigms are named after their most prominent host in Bantu studies. Nominal Prefixes (NPr) attach as overt class markers to nouns. They are also often used to mark agreement on the small sets of qualifying adjectives found in the Bantu languages and Meeussen reconstructs this use in Proto-Bantu too. The Numeral Prefixes (EPr) are reconstructed as a set of prefixes that mark agreement on agreeing cardinal numbers (typically ‘1–5’) and on the interrogative modifier ‘how many’. Pronominal Prefixes (PPr) have the widest distribution and are used to mark class agreement on demonstratives, possessive pronouns, some relative verb forms and genitive (aka connective) relators, among others. The two other prefix paradigms reconstructed for Proto-Bantu, Verbal Prefixes (VPr) and Object

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<sup>9</sup> There are indications in some languages that the immediately postnominal position of possessive pronouns is not an inherent property of their word class, but also linked to their modificational function in an utterance. When a possessive pronoun occurs later in the noun phrase in such languages, it has a non-selective interpretation, sometimes translated as ‘of mine’ or ‘which is mine’ for a 1sg possessor (see also the discussion of Example (30b)).



**Table 2:** The Proto-Bantu class marker paradigms, based on Meeussen (1967: 97). The forms between brackets are those where Meeussen had doubts about the best reconstruction.

sg	NPr	EPr	PPr	PL	NPr	EPr	PPr
cl 1	mǔ-	(ǔ-)	jǔ-	cl 2	bǎ-	bǎ-	bǎ-
cl 3	mǔ-	(ǔ-)	gǔ-	cl 4	mǐ-	(ǐ-?)	gǐ-
cl 5	ǐ-	dǐ-	dǐ-	cl 6	mǎ-	(ǎ-?)	gǎ-
cl 7	kǐ-	kǐ-	kǐ-	cl 8	bǐ-	bǐ-	bǐ-
cl 9	n-	(ǐ-)	jǐ-	cl 10	n-	ǐ-	jǐ-

Prefixes (OPr), are used to index subjects and objects on the verb. They can occur in relative verb forms, but they are not used to mark noun-phrase internal agreement in that case.

As can be seen in Table 2, the formal differentiation between the paradigms is minimal. Nominal prefixes have a low tone, whereas Pronominal and Numeral Prefixes have a high tone, except in classes 1 and 9. Segmentally, the nasal consonants in the NPr correspond to oral stops or nothing in the other paradigms in classes 1, 3, 4 and 6. Nominal *N-* prefixes correspond to a (C)V- prefix in the PPr and EPr paradigms.

Although several contemporary languages reflect the situation reconstructed for Proto-Bantu, we find an amazing amount of variation between the Bantu languages in the number and makeup of agreement marker paradigms. Unfortunately, no comparative study of this variation is currently available either, but we can form an idea of the existing variation by looking at the random sample represented by the eleven grammar sketches in the second edition of *The Bantu languages* (Van de Velde et al. 2019). The languages of this small sample have anywhere between one (Nsong [soo] (DRC)) and six (Pagibete [pae] (DRC) and Kwakum [kwu] (Cameroon)) different paradigms of adnominal agreement prefixes. Some languages lack Numeral Prefixes. Totela [ttl] (Zambia, Namibia) does have Numeral Prefixes, but they all have a vowel /o/, meaning that this paradigm cannot be a direct reflex of the EPr paradigm of Proto-Bantu. Other languages have a dedicated paradigm of Adjective Prefixes, and one has four separate paradigms dedicated to agreement on demonstratives.

The AMAR mechanism provides a plausible straightforward explanation for the extreme variation in this domain and especially for the proliferation of paradigms of adnominal agreement prefixes in the Bantu languages. According to the AMAR scenario, agreement prefixes are created out of agreeing nominalizers. These are typically weak demonstratives (today often identified as arguments), but other pronominal forms can be used as nominalizers too, such as personal pronouns, called *substitutives* in Bantu studies. When a nominalizer

emerges in front of an already existing agreement prefix, the two will coexist for a while as an augment + agreement marker succession. Eventually, this succession can be formally simplified through a merger of the two prefixes, which creates a new paradigm. Evidence for this evolutionary path abounds in the Bantu languages. I will here give three illustrations: the paradigm of Pronominal Prefixes in Simbiti as compared to that of the other Mara varieties, the emergence of paradigms of Relative Prefixes throughout Bantu, and the differences between Nominal Prefixes and the prefixes used to mark agreement on adjectives that can be found all over the Bantu domain.

Of the six very closely related Mara varieties discussed in Aunio et al. (2019), five have a “normal” paradigm of Pronominal Prefixes. However, in one of them, Simbiti [ssc] (Tanzania), the PPr is systematically preceded by the augment on some agreement targets (Aunio et al. 2019: 516–517), as represented in Table 3. This shows that a succession of augment plus agreement prefix can quickly arise and generalize, differentiating the paradigms of otherwise very closely related varieties.

The second illustration concerns the prefixes used in relative verb forms to mark agreement with the relativized noun. Most descriptions of Bantu languages stick to the traditionally known agreement paradigms, rather than recognizing language-specific ones when the data ask for it. Unexpected patterns in paradigms on specific agreement targets are therefore often described in terms of mixed paradigms. These “mixed” paradigms may have the tones of one paradigm and the segmental forms of another one, for instance, and/or may contain prefixes seemingly taken from different paradigms. Nsuka-Nkutsi’s (1982) extensive comparative study of Bantu relative clause constructions dedicates its longest chapter to determining whether the relative verbs in the languages of his sample have a prefix from the VPr paradigm or from the PPr paradigm, or a mixture of both. However, in many languages the more accurate description would recognize

**Table 3:** Paradigms of pronominal prefixes in six Mara varieties (abridged from Aunio et al. 2019: 517). Languages are represented by their ISO 639-3 code: [cwa] Kabwa, [ssc] Simbiti, [ngq] Ngoreme, [ntk] Ikoma, [ikz] Ikizu, and [zak] Zanaki.

Class	[cwa]	[ssc]	[ngq]	[ntk]	[ikz]	[zak]
1	wa-	u-	o-/wo-	o-	o-/wo-	wa-
2	βa-	(a-) βa-	ba-	βa-	βa-	βa-
3	gu-	(u-) yu-	go-	o-	go-	gu-
4	gi-	(i-) yi-	ge-	ye-	ge-/j-	gi-
5	ri-	(i-) ri-	re-	re-	re-	ri-
6	ga-	(a-) ya-	ga-	ya-	ga-	ga-

a dedicated paradigm of Relative Prefixes (RPr), which results from the merger of an agreeing relativizer and a following subject prefix as part of the Bantu Relative Agreement (BRA) cycle (Van de Velde 2021). The BRA cycle is an instance of the AMAR mechanism in those cases where a relativizer starts its life as a nominalizer in an appositional construction.

A clear example can be found in Punu [puu] (Gabon, Congo), because different stages of the BRA cycle coexist as allostructs in this language. In (18a) the relative clause is introduced by a demonstrative of the shape *á*-PPr, where PPr is the stem of the demonstrative, which is identical in shape to a prefix of the Pronominal Paradigm, and which agrees in noun class with the relativized noun. This demonstrative may have originally functioned as a nominalizer in a structure of the type “the person, that one who sewed the garment”. There are no criteria in the language that could show whether it is formally integrated into the relative verb as a prefix or whether it remains a separate word or clitic. Anyway, the *á*-PPr relativizer is immediately followed by the PPr of the relative verb, creating the type of successions of short, prosodically weak elements marking agreement with the same controller that typically emerge through the AMAR mechanism. These successions tend to be simplified in the Bantu languages, potentially resulting in a new paradigm of agreement markers, as shown in (18b), where *á*-*gu*(-)*gu* has been simplified to *águ*-. This is the class 1 form of a new paradigm of Relative Prefixes in Punu of the shape *á*PPr.

(18) Punu

- a. *mu-tu*            [*águ*(-)*gu*-*tsi-ráriga*    *yikútu*]  
      NPr<sub>1</sub>-person    DEM<sub>1</sub>(-)RPr<sub>1</sub>-PST-sew    garment  
      ‘someone who sewed the garment’
- b. *mu-tu*            [*águ*-*tsi-ráriga*    *yikútu*]  
      NPr<sub>1</sub>-person    RPr<sub>1</sub>-PST-sew    garment  
      ‘someone who sewed the garment’  
      (Blanchon 1980: 116)

The third and last illustration of the emergence of new paradigms of agreement markers fueled by the AMAR mechanism concerns adjectives. Although this is rarely pointed out explicitly, prefixes that are used to mark agreement on adjectives also belong to dedicated agreement paradigms in several Bantu languages. An oft-found situation is one in which Adjectival Prefixes are identical to Nominal Prefixes, except in classes 9 and/or 10, where they are identical to the Pronominal Prefixes or look like a PPr-NPr- succession or are segmentally like a PPr but tonally like an NPr. Baka (2000: 348, 363–365) reports this for the languages Lundu [bdu], Basaa [bas] (Cameroon), Tsogo [tsv] (Gabon), Doko [bwl], Ngombe [ngc], Holoholo [hoo], Tembo [tbt], Dzing [diz] (DRC), Pogolo [poy], Mwera [mwe] (Tanzania),

**Table 4:** Partial NPr, APr and PPr paradigms in Holoholo and Tsogo (Baka 2000: 348, 364).

Holoholo				Tsogo		
	NPr	APr	PPr	NPr	APr	PPr
1	mò-	mò-	ò-	mò-	mó-	ò-
3	mò-	mò-	gú-	mò-	mó-	ú-
4	mì-	mì-	gí-	mì-	mí-	mí-
6	mà-	mà-	gǎ-	mà-	má-	má-
9	N-	gì-	gí-	N-	ín-	ì-
10	N-	gì-	gí-	N-	dín-	dí-

Lenje [leh], Soli [sby] (Zambia), Kwanyama [kua], and Luyi [lyn] (Angola, Namibia). Table 4 shows part of the relevant paradigms for Holoholo and Tsogo.

The augment is usually formally identical to the PPr in the Bantu languages and is generally subject to a process of attrition whereby it first loses its initial consonant, then its entire segmental form and finally its tone. What must have happened in the languages listed above is that a succession of a nominalizing augment and a NPr was reduced by deletion of the augment in those classes where it was the first of a succession of prosodically weak syllabic agreement prefixes. It was maintained in classes 9 and 10, because these originally had a non-syllabic nasal prefix, thereby leaving a trace of a completed cycle of accretion followed by attrition.

4.2 Semantic agreement within the noun phrase

Another characteristic of agreement in the Bantu languages for which the AMAR mechanism might provide a diachronic explanation is the fact that semantic agreement reaches every position on the agreement hierarchy, including most adnominal targets. We speak of semantic agreement, as opposed to syntactic agreement, when the choice of agreement pattern depends on the meaning of the controller noun, rather than on its morphological class as defined by an overt class marker (Corbett 1979). The best known case of semantic agreement in Bantu linguistics is the use of the agreement patterns of class 1 (sg) and 2 (pl) with animate controllers, whatever their overt class marker (Maho 1999: 124; Wald 1975).<sup>10</sup> In the

**10** Animate agreement is not the only type of semantic agreement in the Bantu languages. See Van de Velde (2019: 242–247) for a typology, which includes evaluative agreement, categorical agreement, superclassing and locative agreement.

classic Swahili example in (19a), the noun *ki-boko* ‘hippopotamus’ has a nominal prefix of class 7, but it triggers semantic agreement in the form of a class 1 prefix on the demonstrative and on the object marker in the verb. In contrast, the inanimate noun *ki-su* ‘knife’ triggers syntactic class 7 agreement on all agreement targets in (19b).

(19) Swahili [swh] (Tanzania, Kenya, ...)

- a. *yu-le ki-boko ni-li-mw-ona*  
 PPR<sub>1</sub>-DEM NPR<sub>7</sub>-hippo VPR<sub>1sg</sub>-PST-OPR<sub>1</sub>-see-FV  
 ‘That hippo, I saw it.’
- b. *ki-le ki-su ni-li-ki-on-a*  
 PPR<sub>7</sub>-DEM NPR<sub>7</sub>-knife VPR<sub>1sg</sub>-PST-OPR<sub>7</sub>-see-FV  
 ‘That knife, I saw it.’  
 (Wald 1975: 241–242)

There is an extremely strong tendency in the languages of the world regarding the distribution of semantic versus syntactic agreement over agreement targets, captured by the agreement hierarchy (20). The higher (i.e., the more to the right) a target is on the hierarchy, the more likely semantic agreement becomes (Corbett 1979).

(20) attributive > predicate > relative pronoun > personal pronoun

Two things are noteworthy about the Bantu languages that have animate agreement. First, animate agreement tends to cover all the positions on the hierarchy. Second, there is often a split among the adnominal modifiers, in that some take semantic agreement and some syntactic agreement. Interestingly, whenever there remain targets that have syntactic agreement, possessive pronouns are among them. Since possessive pronouns are also often the modifiers that are closest to the noun, there is a clear link between word order and agreement type, which may be explainable in terms of the AMAR mechanism. In Swahili, for instance, animate nouns trigger syntactic agreement on possessive pronouns if they belong to class 10 (21a); also, classes 5, 6, or 9 if they have a human referent (21b). In all other classes, animate nouns trigger semantic agreement on every agreement target. The examples in (21) illustrate the two types of agreement with the same controller: syntactic agreement of class 9/10 on the possessive pronoun and semantic agreement of class 1/2 on the verb.

(21) Swahili

- a. *ng’ombe z-a-ngu wa-me-fika*  
 10.COW PPR<sub>10</sub>-POSS<sub>1sg</sub> VPR<sub>2</sub>-PERF-arrive  
 ‘My cows have arrived.’

- b. *rafiki y-angu a-me-fika*  
 9.friend PPR<sub>9</sub>-POSS<sub>1SG</sub> VPR<sub>1</sub>-PERF-arrive  
 ‘My friend has arrived.’  
 (Wald 1975: 283–284)

In the closely related Kami [kcu] (Tanzania) language, semantic agreement is somewhat less invasive than in Swahili, in that adnominal modifiers other than a possessive pronoun can have either semantic or syntactic agreement. Nevertheless, possessive pronouns remain alone at the bottom of the hierarchy for obligatorily having syntactic agreement (Wald 1975).

- (22) Kami  
*ka-ronda ng’ombe dz-angu n-hulu / wa-kulu*  
 VPR<sub>1</sub>-like 10.cow PPR<sub>10</sub>-1SG.POSS NPR<sub>10</sub>-big / NPR<sub>2</sub>-big  
 ‘He likes my big cows.’  
 (Wald 1975: 300)

Much more towards the West, we find a similar situation in Lunda [lun] (Angola, DRC, Zambia) (Kawasha 2003). Animate nouns trigger agreement of class 1 in the singular and class 2 in the plural, irrespective of the shape of their nominal class prefix (23).

- (23) Lunda  
*Yena, kansi wenza haloshi.*  
*yena ka-ansi wu-a-inz-a haloshi*  
 3SG.PRO NPR<sub>12</sub>-child VPR<sub>1</sub>-PST-COME-FV yesterday  
 ‘The child came yesterday.’  
 (Kawasha 2003: 98)

As in Swahili, possessive pronouns have syntactic agreement (24a), but contrary to Swahili, genitive modifiers of singular nouns have syntactic agreement too, on the condition that they are used to express possession, i.e., that they have a localizing function (24b). When a genitive modifier is used to qualify or classify the head noun, it takes semantic agreement (25).

- (24) Lunda
- a. *káwa kámi*  
*ka-wa ka-ámi*  
 NPR<sub>12</sub>-dog PPR<sub>12</sub>-1SG.POSS  
 ‘my dog’
- b. *kasumbi katata*  
*ka-sumbi ka-a-tata*  
 NPR<sub>12</sub>-fowl PPR<sub>12</sub>-CON-my.father  
 ‘the fowl of my father’  
 (Kawasha 2003: 112, 109)

- (25) Lunda  
*ñombi wamwisaña*  
*ñombi wu-a-mu-i-saña*  
 9.COW PPR<sub>1</sub>-CON-NPR<sub>18</sub>-NPR<sub>5</sub>-bush  
 ‘a buffalo’  
 (Kawasha 2003: 108)

The Lunda data thus show a link between type of modification and agreement type. If there is indeed an amarizability hierarchy and if it is correct that more inherently selective modifiers are less likely to be touched by the AMAR mechanism, then the Lunda facts too suggest a link between AMAR and semantic agreement within nominal expressions. Since the agreement hierarchy is basically a hierarchy of syntactic distance (Corbett 1979), semantic agreement on a modifier is more likely to occur when this modifier is apposed than when it is adnominal. Whether or not semantic agreement within nominal expressions can be considered a trace of AMAR remains to be demonstrated, e.g., by means of a comparative study of any systematic links between word order and semantic agreement.

### 4.3 Agreement with the neighbor

The section on word order discussed two phenomena that may be indicative of the relative non-integrality of nominal expressions in the Bantu languages, namely word order freedom among adnominal modifiers (quite frequent) and discontinuity (very rare). Neither of these is clearly linked to the AMAR mechanism, which may nevertheless have facilitated their emergence. There is a very rare similar phenomenon that has to do with agreement and that could be called agreement with the neighbor. The only examples that I know are from Kwakum [kwu] (Cameroon). In an integral noun phrase, one would expect there to be a single controller of agreement on non-embedded modifiers. In the Kwakum example in (26), however, the demonstrative has the choice to agree in class with its semantic head ‘houses’ (26a) or with the number ‘two’ that quantifies ‘houses’, and that has its own gender specification. The second option suggests an appositional structure, literally translatable as ‘the houses, these two’.

- (26) Kwakum
- a. *ntóó ìbàà mí<sup>L</sup> ké*  
*ñ-tóó<sup>L</sup> ì-báà<sup>H</sup> mí-ké<sup>L</sup>*  
 NPR<sub>6</sub>-house NPR<sub>2</sub>-two PPR<sub>6</sub>-DEM

- b. *ntóó ìbáà jì<sup>+</sup>ké*  
*ñ-tóó<sup>L</sup>      ì-báà<sup>H</sup>      jì-ké<sup>L</sup>*  
 NPR<sub>6</sub>-house    NPR<sub>2</sub>-two    PPT<sub>2</sub>-DEM  
 ‘these two houses’  
 (Njantcho Kouagang 2018: 166)

To summarize, Section 4 pointed out how Bantu languages differ greatly from each other in the number and shape of their paradigms of prefixes that mark gender agreement on adnominal modifiers and argued that at least some of this variation is due to the addition of agreeing nominalizers that merge with the existing prefixes. In fact, the AMAR mechanism may well be responsible for the very existence of exuberant alliterative agreement in Bantu nominal expressions, a hypothesis that would need to be verified in the larger Benue-Congo family. It also pointed out a link between the frequent immediately postnominal position of possessive pronouns and the fact that they are the last agreement target to resist semantic agreement, explainable if we assume that possessive pronouns are the modifiers that are most resistant to the AMAR mechanism. In the next section, we look at a third characteristic of nominal expressions in the Bantu languages that is arguably shaped by the AMAR mechanism, namely the existence of strong and unexpected prosodic boundaries within nominal expressions.

## 5 Prosodic boundaries in nominal expressions

As O'Connor and Patin (2015) show for Ngazidja, loose appositions form their own intonational phrase, meaning that they are marked by a strong prosodic boundary at their left and their right edge. Independently, it has often been noticed that an augment tends to create a prosodic boundary to its left. When erstwhile apposed nominalized modifiers are syntactically reintegrated into a more or less integral NP as part of the AMAR mechanism, such prosodic boundaries can remain as traces of the older appositional structure.

An example can be found in Tonga [toi] (Namibia, Zambia, Zimbabwe), which according to Carter (1963: 34) has two alternative genitive constructions without an obvious semantic or pragmatic difference. In one of them the noun and its genitive modifier form a prosodic unit characterized by high tone spreading (27a). In the other, the genitive relator is marked by an augment and there is a prosodic break between the head noun and the genitive modifier, which blocks high tone spreading (27b). The construction in (27b) has the characteristics of one that has gone or is going through the AMAR mechanism. The result of high tone spreading due to the absence of a prosodic break between the head noun and the genitive modifier is underlined in (27a).



## (27) Tonga

- a.  $\varphi(kú-^{\dagger}bókó)$   $kw-á$   $^{\dagger}mú-kàìntù)$   
 NPr<sub>15</sub>-arm PPr<sub>15</sub>-CON 1-woman
- b.  $\varphi(kú-bòkò)$   $\varphi(i-^{\dagger}kw-á$   $mú-kàìntù)$   
 NPr<sub>15</sub>-arm AUG-PPr<sub>15</sub>-CON 1-woman  
 ‘the arm of a woman’

The remainder of this section discusses prosodic boundaries in the nominal expressions of three Bantu languages in light of the AMAR hypothesis, viz. Makonde (5.1), Chichewa (5.2) and Rutooro (5.3).<sup>11</sup>

## 5.1 Prosodic boundaries in Makonde nominal expressions

Phonological phrases are marked by penultimate vowel lengthening in Makonde varieties [kde] (Mozambique, Tanzania). As is shown by Rolle and Hyman (2019), adnominal modifiers can be divided into three groups, depending on their prosodic behavior: (i) those that always form their own phonological phrase, referred to as 2 $\varphi$  (28), (ii) those that are included in the phonological phrase of the head noun (1 $\varphi$ ) (29) and (iii) those that can do both (1~2 $\varphi$ ) (30).

## (28) Makonde of Zanzibar

- a.  $\varphi(língéla)$   $\varphi(líkúmeêne)$   
 $lí-ngéla$   $lí-kúmêne$   
 NPr<sub>5</sub>-mango NPr<sub>5</sub>-big  
 ‘a big mango’
- b.  $\varphi(viloôngo)$   $\varphi(viviili)$   
 $vi-lôngo$   $vi-vili$   
 NPr<sub>8</sub>-pot PPr<sub>8</sub>-two  
 ‘two pots’  
 (Rolle and Hyman 2019; citing Manus 2003; 2018)

(29) 1 $\varphi$  modifiers

- $\varphi(vílóngó aviilá)$   
 $ví-lóngó$   $avilá$   
 NPr<sub>8</sub>-pot 8.DEM  
 ‘those pots’

<sup>11</sup> See Himmelmann (this issue) for a more general discussion on the relation between prosodic phrasing and phrase structure. It is not yet clear whether or how the Bantu phenomena raised in this section fit into his proposal.

(30) 1~2 $\varphi$  modifiers

- a.  $\varphi$ (sijúlú saángu)  
 sí-júlú s-ángu  
 NPR<sub>7</sub>-hat PPR<sub>7</sub>-1SG.POSS  
 'my hat'
- b.  $\varphi$ (sijúlú)  $\varphi$ (sáangu)  
 sí-júlú s-ángu  
 NPR<sub>7</sub>-hat PPR<sub>7</sub>-1SG.POSS  
 'a hat of mine'

There is some variation between the Makonde lects, summarized in the hierarchy in (31), which should be read as follows: If the demonstrative or possessive pronoun are 1~2 $\varphi$ , then the adjective is obligatorily 2 $\varphi$  and if the adjective is 2 $\varphi$ , then so is the number.

## (31) DEM / POSS &gt; ADJ &gt; NUM

This suggests that possessive pronouns and demonstratives are the least likely to be affected by the AMAR mechanism in Makonde. At least for possessive pronouns this is in line with the word order and agreement facts discussed in the preceding sections with data from other Bantu languages. Another relevant observation with respect to the Makonde examples is that the behavior of modifiers with respect to the AMAR mechanism is not always exclusively determined by their word class, but also by the type of modification they express. The English translation of the examples in (30) suggests that the possessive pronoun is used selectively as a localizing modifier in (30a) and non-selectively as a classifying modifier in (30b).

The grammatical outcomes of the AMAR mechanism are highly unpredictable at every stage. The alternative construal of adnominal modifiers as apposed nominalizations may be realized more or less frequently depending on the language and the modifier. Subsequently, appositional constructions may or may not conventionalize. Phonological phrase formation in complex NPs in the Makonde lects is particularly interesting in this respect. When a number and an adjective combine, they each form their own phonological phrase (32) in Makonde of Zanzibar, except when they are followed by a demonstrative, in which case all the modifiers are included in a single phonological phrase (33). A 1 $\varphi$  modifier that precedes a 2 $\varphi$  modifier does not have this effect of prosodic merger (34).

## (32) Makonde of Zanzibar

- $\varphi$ (vi-loôngo)  $\varphi$ (ví-kúmeêne)  $\varphi$ (vy-á naáswe)  $\varphi$ (vi-viili)  
 NPR<sub>8</sub>-pot APR<sub>8</sub>-big PPR<sub>8</sub>-CON white APR<sub>8</sub>-two  
 'two big white pots'  
 Manus (2018)

- (33)  $\varphi$ (*ví-lóngó*    *ví-kúméné*    *vy-á*    *náswé*    *ví-víli*    *aviilá*)  
 NPR<sub>8</sub>-pot    APR<sub>8</sub>-big    PPR<sub>8</sub>-CON    white    APR<sub>8</sub>-two    8.DEM  
 ‘these two big white pots’
- (34)  $\varphi$ (*li-jembé*    *ly-aáko*)     $\varphi$ (*lí-díkidiiki*)  
 NPR<sub>5</sub>-hoe    PPR<sub>5</sub>-2SG.POSS    APR<sub>5</sub>-small  
 ‘your small hoe’

In terms of the AMAR mechanism, there is a certain mismatch between the 1 $\varphi$  prosodic behavior of demonstratives and their phrase final position in Makonde: their prosodic behavior suggests that they have not undergone the AMAR mechanism in the history of Makonde, but their position after 2 $\varphi$  modifiers suggests that they have, otherwise we would have expected a N<sub>DEM</sub> ADJ/NUM pattern. The prosodic structure of (33) shows that it is the prosodic properties of demonstratives that reveal their history and that demonstratives have not or not recently undergone the AMAR mechanism. Instead, what must have happened is that complex integral NPs that contain a demonstrative have survived as such. In contexts where they are not followed by a demonstrative, adjectives and numbers have inherited the prosodic properties of their appositive use. Therefore, being 1 $\varphi$  or 2 $\varphi$  is synchronically determined by several factors in Makonde, as specified in (35).

- (35) 1 $\varphi$  or 2 $\varphi$  determined by:  
 Demonstratives: word class  
 Adjectives and numbers: word class and construction  
 Possessive pronouns: construction and type of modification

## 5.2 Prosodic boundaries in Chichewa nominal expressions

A variation on this theme is found in Chichewa, which has a similar split in the prosodic properties of adnominal modifiers and where phonological phrases are also demarcated by penultimate vowel length (Downing and Mtenje 2011). The absence of prosodic boundaries within syntactic units appears to be the norm in Chichewa, as shown by the fact that the ditransitive clause in (36) forms a single phonological phrase. All Chichewa examples are from Downing and Mtenje (2011).

- (36)  $\varphi$ (*a-lendó*    *a-na-dyétsa*    *a-nyaní*    *nsóomba*)  
 NPR<sub>2</sub>-visitor    VPR<sub>2</sub>-TAM-eat.CAUS    NPR<sub>2</sub>-baboon    10.fish  
 ‘The visitors fed the baboons fish.’

Possessive pronouns, and the modifiers ‘other’ and ‘all’ do not form their own phonological phrase (37).

- (37) a.  $\varphi$ (nyama yáthú iina)  
           9.meat 9.1SG.POSS 9.other  
           ‘our other meat’  
       b.  $\varphi$ (ma-dengu éná oónse)  
           NPR<sub>6</sub>-basket 6.other 6.all  
           ‘all the other baskets’

As in Makonde, adjectives and genitives do form their own phonological phrase, but contrary to Makonde this phrase is only demarcated at its right edge. In other words,  $2\varphi$  modifiers do not create a prosodic boundary on their left-hand side, which may be interpreted as a sign of ongoing prosodic reintegration. In (38), the number ‘five’ creates a prosodic boundary to its right, in the middle of the Primary object phrase ‘five big baboons’. The qualifying connective ‘big’ creates a prosodic boundary to its right too.

- (38)  $\varphi$ (alendó a-na-dyétsa a-nyaní á-saanu)  $\varphi$ (á-á-kúulu)  $\varphi$ (nsóomba)  
       2.visitor VPR<sub>2</sub>-TAM-eat.CAUS NPR<sub>2</sub>-baboon EPR<sub>2</sub>-five CON<sub>2</sub>-APR<sub>2</sub>-big 10.fish  
       ‘The visitors fed five big baboons fish.’

Another difference with Makonde is that  $2\varphi$  modifiers have conventionalized their prosodic boundary across all constructions. That is, when they are followed by a  $1\varphi$  modifier, they still induce a phrase boundary (39).

- (39)  $\varphi$ (a-galú áthú á-á-kúulu)  $\varphi$ (óonse)  
       NPR<sub>2</sub>-dog 2.1SG.POSS CON<sub>2</sub>-APR<sub>2</sub>-big 2.all  
       ‘all our big dogs’

### 5.3 Prosodic boundaries in Rutooro nominal expressions

As a final illustration of the intricate prosodic patterns the AMAR mechanism can create, we will look at the prosodic properties of nominal expressions in Rutooro [ttj] (Uganda, DRC), which are interesting because they clearly show different layers of the application of the AMAR mechanism, as well as the role of the augment in the creation of phonological boundaries. All data are from Clemens and Bickmore (2020), who gathered them with a native speaker consultant.

Just as in Makonde and Chichewa, Rutooro adnominal modifiers can be divided into different types depending on their prosodic properties, but where

Makonde and Chichewa have two types, Rutooro has three. Possessive pronouns, genitives, numbers, adjectives, and the modifiers ‘another’, ‘many’ and ‘how many’ correspond formally to Chichewa  $2\phi$  modifiers, because they create a prosodic boundary to their right, but not to their left (38). The mutual ordering of such modifiers is free (40a)–(40b), except that the possessive pronoun has to be in immediately postnominal position (40c).<sup>12</sup> Phonological phrases are demarcated by high pitch on their penultimate syllable in Rutooro.

(40) modifiers that create a prosodic boundary to their right: Type  $-(\text{MOD})_\phi$

- a.  $\phi(a\text{-}ma\text{-}iba \quad a\text{-}sátu) \quad \phi(gáá\text{-}ndi)$   
 AUG<sub>6</sub>-NPR<sub>6</sub>-dove    EPR<sub>2</sub>-three    PPR<sub>6</sub>-another  
 ‘another three doves’
- b.  $\phi(a\text{-}ma\text{-}iba \quad gáá\text{-}ndi) \quad \phi(a\text{-}sátu)$   
 AUG<sub>6</sub>-NPR<sub>6</sub>-dove    PPR<sub>6</sub>-another    EPR<sub>2</sub>-three  
 ‘another three doves’
- c.  $\phi(e\text{-}bi\text{-}cuumbiro \quad by\text{-}áánge) \quad \phi(bí\text{-}íngi) \quad / \quad *bíngi \text{ } byáánge$   
 AUG<sub>8</sub>-NPR<sub>8</sub>-kitchen    PPR<sub>8</sub>-1SG.POSS    PPR<sub>8</sub>-many  
 ‘many kitchens of mine’

The second type of Rutooro modifiers corresponds formally to Makonde  $2\phi$  modifiers, in that they create a prosodic boundary to their right and to their left. Demonstratives and the modifier ‘all’ belong to this type. In a sense, the situation in Rutooro appears to be the inverse from that in Makonde, where demonstratives are prosodically most closely integrated in the noun phrase.

(41) modifiers that create a prosodic boundary to their right and left: Type  $(\text{MOD})_\phi$

- $\phi(e\text{-}ki\text{-}sumurúzo) \quad \phi(kí\text{-}nu)$   
 AUG<sub>7</sub>-NPR<sub>7</sub>-key    PPR<sub>7</sub>-this  
 ‘this key’

Finally, Rutooro has one type of modifier that behaves like  $1\phi$  modifiers in Makonde, namely verb-initial relative clauses (42). They cancel any NP-internal prosodic boundaries to their left.

(42) modifiers that do not create prosodic boundaries: Type  $-(\text{MOD})$

- $\phi(a\text{-}ba\text{-}ana \quad ba\text{-}ruungi \quad ba\text{-}sóm\text{-}a)$   
 AUG<sub>2</sub>-NPR<sub>2</sub>-child    APR<sub>2</sub>-good    VPR<sub>2</sub>-read-FV  
 ‘good children who read’

<sup>12</sup> The absence of a left-hand side prosodic boundary is marked by a hyphen in the schematic representations of modifier types:  $-(\text{MOD})_\phi$ .

Adjectives and relative clauses can be used in an alternative construction where they are preceded by an augment and obligatorily placed at the end of the nominal expression (43). In this construction they belong to prosodic Type  $(\text{MOD})_\varphi$ , i.e., with a prosodic break to their left and their right. They are or have most recently been in stage 1 of the AMAR mechanism.

- (43) a.  $\varphi(e\text{-}ki\text{-}tábu)$   $\varphi(e\text{-}ki\text{-}rúúngi)$   
 AUG<sub>7</sub>-NPR<sub>7</sub>-book AUG<sub>7</sub>-APF<sub>7</sub>-good  
 ‘the good book’  
 (translated as ‘the book that is good’ by Clemens and Bickmore’s consultant)
- b.  $\varphi(a\text{-}báá\text{-}ntu)$   $\varphi(a\text{-}ba\text{-}sóm\text{-}a)$   
 AUG<sub>2</sub>-NPR<sub>2</sub>-people AUG<sub>2</sub>-VPR<sub>2</sub>-read-FV  
 ‘the people who read’

A final relevant observation about Rutooro is that non-subject relative clauses without an augment also belong to prosodic Type  $(\text{MOD})_\varphi$  when they have a lexical subject (44).

- (44)  $\varphi(o\text{-}mw\text{-}áána)$   $\varphi(a\text{-}ba\text{-}limi$   $ba\text{-}ta\text{-}góónz\text{-}a)$   
 AUG<sub>1</sub>-NPR<sub>1</sub>-child AUG<sub>2</sub>-NPR<sub>2</sub>-farmer VPR<sub>2</sub>-NEG-like-FV  
 ‘the child that the farmers don’t like’

This suggests that it may not be the appositional structure as such that creates prosodic boundaries in Rutooro, but the current or historical presence of the augment. If the hypothesis of paradigm creation in Section 4.1 is right, all the paradigms of class markers in the nominal domain have the potential of originating at least partly in an augment-like nominalizer. As pointed out by Clemens and Bickmore (2020), we find prosodic boundaries wherever nominal expressions are adjacent in Rutooro.

The way the AMAR hypothesis accounts for the Rutooro facts can be summarized as follows. When previously apposed modifiers lose their syntactic independence and are reintegrated into the noun phrase, the left boundary of their prosodic domain fades, but their right boundary stays. This right boundary is only realized if it is followed by a constituent that forms its own phonological phrase, either of Type  $-\text{MOD})_\varphi$  or Type  $(\text{MOD})_\varphi$ . Demonstratives and ‘all’ have only recently entered the AMAR mechanism. Their prosodic reintegration has not yet begun so that the left boundary of their prosodic domain is still active. Augmentless relative clauses without a subject start with a Verbal Prefix (see Example (42)). They therefore lack a boundary creating nominal marker and they do not form a prosodic domain. When they follow a Type  $-\text{MOD})_\varphi$  modifier, this

modifier's right boundary cannot be realized, by lack of a following prosodic domain.

## 6 Conclusions

Despite their close genealogical relatedness, the Bantu languages show a bewildering amount of variation in the structure of their nominal expressions. Much of this variation is typologically unusual. This is most famously the case for some of the attested word order patterns, but the existence of prosodic boundaries between nouns and their modifiers that are stronger than those between constituents of the clause in Chichewa, the presence of determiner-like elements ("augments") on adnominal modifiers and the proliferation of paradigms of agreement markers are typologically remarkable too. The comparative word order facts have pushed typologists such as Rijkhoff to suggest that nominal expressions may not be integral noun phrases in the Bantu languages. However, there are few synchronic indications for non-integrality of NPs in the individual Bantu languages, if any. According to the AMAR hypothesis, this situation is due to two tendencies with opposite effects on the integrality of noun phrases. The first of these is a tendency for appositional structures to emerge. These usually imply a nominalizer that derives an independent referring expression from an adnominal modifier. This nominalizer is almost always an agreeing element of demonstrative or pronominal origin. The second tendency is for these apposed semantic modifiers to be reintegrated into a more rigidly structured noun phrase. The erstwhile nominalizer is thereby reinterpreted as a mere agreement marker and tends to erode or merge with the agreement marker that was already present on the modifier.

The AMAR mechanism is a highly unpredictable type of morphosyntactic change. This makes it in principle a good type of diachronic explanation for the extreme and chaotic diversity in nominal expressions between and within the Bantu languages. A disadvantage is that, in the absence of older written sources, the absence of clear predictions makes it harder to demonstrate its validity. However, the strength of the AMAR hypothesis is that it makes sense of many logically independent characteristics of nominal expressions, showing and explaining multiple correlations between them.

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