

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

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7

8 **Abstract**

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

22

23 **keywords**

24 apposition, word order, prosody, historical syntax, agreement, Bantu languages

25

26 **1. Introduction**

27 The Bantu languages show an extraordinary range of crosslinguistic and intralinguistic
28 constructional variation in their nominal expressions. The theoretical interest of this variation

1 has been noted in the domain of word order typology right from the start, with Greenberg's
2 Universal 20 (1963: 87). Greenberg had found "powerful constraints" in the languages of the
3 world on the mutual ordering of Demonstrative, Numeral and Adjective when this is fixed. In
4 his sample, these modifiers have to occur in the order DEM NUM ADJ if any or all precede the
5 noun and in the mirror image ADJ NUM DEM if all of them follow. However, Universal 20 also
6 allows the order DEM NUM ADJ among postnominal modifiers, because Greenberg knew it
7 exists in the Bantu language Kikuyu [kik] (Kenya). When Hawkins (1983) reformulated
8 Universal 20 on the basis of a sample of 300 languages, he concluded that no absolute
9 predictions can be made on the mutual ordering of the three modifiers if all of them follow
10 the noun. The presence in his sample of the Bantoid languages Aghem [agq] and Noni [nhu]
11 (both Cameroon) was responsible for this further weakening of Universal 20. They have the
12 orders N ADJ DEM NUM and N DEM {ADJ NUM} respectively.¹

13 Nevertheless, the languages of the world show an extremely strong statistical preference for
14 ordering patterns that are iconic or "homomorphic" (Culbertson, Schouwstra & Kirby 2020)
15 in reflecting the differences in scope between types of modifiers. Following Rijkhoff (2008),
16 adnominal modifiers can be divided into five functional types. In increasing order of scope
17 these are: *classifying*, *qualifying*, *quantifying*, *localizing* and *discourse-referential*. For
18 instance, in a complex noun phrase like *these three delightful examples of semantic agreement*,
19 the classifying modifier *of semantic agreement* specifies what kind of examples are denoted.
20 The qualifying modifier *delightful* specifies a property of the classified noun *examples of*
21 *semantic agreement*. In turn, the quantifying modifier *three* has scope over the qualifying
22 modifier, the classifying modifier and the head noun. Finally, the modifier *these* locates
23 everything in space or discourse and has scope over all the other modifiers. Although the
24 match between functional types of modifiers and word classes is not perfect, classifying and
25 qualifying modifiers can be mapped to adjectives, qualifying modifiers to numerals and
26 localizing and discourse-referential modifiers to demonstratives. Therefore, out of the twenty-
27 four logically possible orders between the four morphosyntactic elements included in

¹ The Bantoid family comprises the Bantu languages (also called Narrow Bantu) and its 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.

1 Universal 20 only the eight orders in (1) are iconic (Rijkhoff 2008: 800). Based on counts in
 2 Dryer (2018), N ADJ NUM DEM is by far the most widely attested patterns in the languages of
 3 the world.

- 4 (1) DEM NUM ADJ N
 5 DEM ADJ N NUM
 6 NUM ADJ N DEM
 7 ADJ N NUM DEM
 8 DEM NUM N ADJ
 9 DEM N ADJ NUM
 10 NUM N ADJ DEM
 11 N ADJ NUM DEM

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

N ADJ NUM DEM	Chichewa [nya] (Bentley & Kulemeka 2001: 21)
N ADJ DEM NUM	Ngazidja [zdz] (Patin, Mohamed-Soyir & Kisseberth 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)

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

19 In order to make sense of these violations of his principle of iconicity, Rijkhoff suggests that
 20 Bantu nominal expressions may be non-integral, i.e. that semantic modifiers of a noun are not

² 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.

1 in a direct construction with that noun, but rather in a distinct phrase at the level of the clause,
2 in apposition with the semantically modified noun (Rijkhoff 2002: 274–275; 2008: 804).
3 However, Dryer (2018: 827) points out that there is usually no independent evidence for the
4 appositional nature of the constructions that violate Rijkhoff’s principle of iconicity. Dryer’s
5 skepticism proves to be valid when we consider the Kikuyu language, whose default N DEM
6 NUM ADJ order is radically non-iconic, yet synchronically clearly does not involve apposition.
7 As indeed pointed out by Mugane (1997: 39), every departure from the default word order
8 asks for special comma intonation. In other words, it is the iconic word order that would
9 require an intonational pattern that is indicative of apposition.

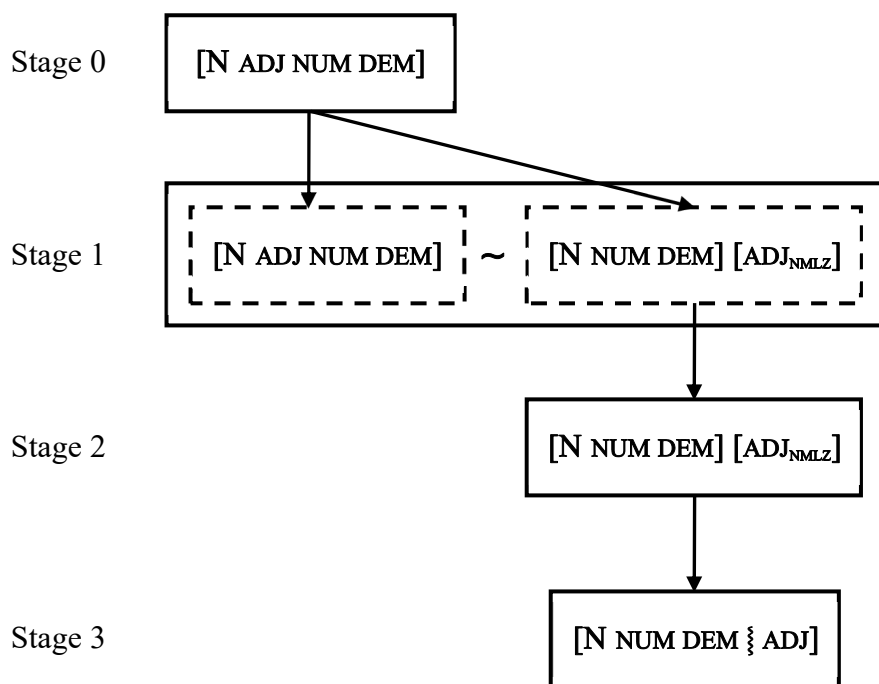
10 I argue that Rijkhoff’s and Dryer’s seemingly contradictory observations are both valid for
11 the Bantu languages, in that the typologically unusual word order patterns are due to a scenario
12 of morphosyntactic change that involves the emergence of appositional structures which are
13 subsequently reintegrated into more coherent noun phrases. I will call this scenario the AMAR
14 mechanism, short for *Adnominal Modifier Apposition and Reintegration*. Independent
15 evidence for the AMAR mechanism is found in other typologically unusual characteristics of
16 Bantu nominal expressions that are logically independent but partially correlated. One such
17 characteristic is the recurrent presence of determiner-like morphemes on adnominal modifiers.
18 A related one is the proliferation of paradigms of agreement markers. A third relevant
19 typological peculiarity is the presence of strong prosodic boundaries within nominal
20 expressions. These characteristics will be discussed in the following sections. Section 2
21 explains how the AMAR mechanism works. Section 3 elaborates on word order. The idea that
22 erstwhile nominalizers are reinterpreted as agreement markers is further explored in Section
23 4 on agreement within the noun phrase, where I will argue that the existence of multiple
24 paradigms of agreement markers can be accounted for by the AMAR mechanism and that this
25 might also be true for the presence of semantic agreement on the majority of adnominal
26 modifiers. Section 5, finally, will look at prosodic boundaries within nominal expressions as
27 vestiges of appositional structures.

28

29 **2. The AMAR mechanism**

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

12 The first stage of the AMAR mechanism is discrete and relatively easily observable. The
13 second and third stages are incremental and potentially overlapping. They give rise to
14 constructions that cannot be straightforwardly typologized as either having or lacking a rigid
15 phrase structure (Louagie & Reinöhl, this issue). Evidence for AMAR is found in formal
16 remnants of erstwhile appositional structures. Figure 1 is a schematic representation of the
17 AMAR scenario applied to an adjective. The symbol § between the demonstrative and the
18 adjective in Stage 4 symbolizes any traces of the former appositional structure, such as a
19 prosodic boundary or the altered shape of the agreement prefix of the adjective due to fusion
20 between a nominalizer and the original agreement prefix.



1 Figure 1. The AMAR mechanism

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

7 (2) Bemba (Kasonde 2009: 167)⁴

8 a. à-báá-ntù bà-kúlú bà-bìlì
 9 AUG₂-NPr₂-person NPr₂-big NPr₂-two

10 ‘the two big men’

11 b. à-báá-ntù bà-bìlì á-bà-kúlú
 12 AUG₂-NPr₂-person NPr₂-two AUG₂-NPr₂-big

13 ‘the two big men’ (lit. ‘the two men, the big ones’)

³ 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 (≈ genitive) relator; FV final vowel (a TAM suffix); DEM demonstrative; EPr Numeral Prefix; LOC locative; NEG negative; NMLZ nominalizer; NPr nominal prefix; OPr Object Prefix; PERF perfect; POSS possessive; PPr Pronominal Prefix; PRO personal pronoun; PST past; RPr Relative Prefix; TAM tense-aspect-modality marker; VPr verbal prefix.

⁴ I am grateful to Nancy Kula for having confirmed the well-formedness of examples (2a-b).

1 c. *à-báá-ntù bà-bìlì bà-kúlú

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

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

18 (3) Nyakyusa (Lusekelo 2009: 320)

19 u-n-yambala ju-mo u-n-dondo fiijo

20 AUG₁-NPr₁-man NPr₁-one AUG₁-NPr₁-poor very

21 ‘one very poor man’

22 The absence of an allostruct with a non-final, augmentless adjective means that the Nyakyusa
23 construction in (3) is no longer in stage 1, i.e. that at one point the appositive structure has
24 conventionalized. However, here, as in many other cases, it is hard to determine whether the
25 structure is still best analyzed as two referring expressions in apposition (stage 2) versus one,
26 more formally integrated nominal expression (stage 3). This is partly due to a lack of detailed
27 grammatical analyses in this domain, e.g. taking prosody into account, but partly also to the
28 fact that formal integration is an incremental process.

29 I do not know what motivates the emergence of the appositional structure in stage 1, nor what
30 the semantic-pragmatic differences are between the integral and the appositional allostructs at

1 that stage, if any. The few available analyses remain vague and point in different directions.
 2 One possibility is that adnominal adjectives are used non-selectively as qualifying modifiers,
 3 whereas nominalized and apposed adjectives are initially used selectively as localizing
 4 modifiers.⁵ This distinction is sometimes characterized in terms of emphasis (i.e.
 5 contrastivity?), sometimes in terms of definiteness. For instance, Ashton et al. (1954: 387)
 6 report on the existence of allostructs in Ganda [lug] (Uganda) similar to those illustrated for
 7 Bemba in (2a-b), but involving a numeral. When a numeral and a qualifying adjective are
 8 combined, the default construal has N NUM ADJ order and no augment on the numeral (4a).
 9 When the numeral follows the adjective, it acquires an augment, and the augment of the
 10 adjective apparently becomes optional (4b). This construction is said to be used “to emphasize
 11 the numeral.” Hyman & Katamba (1991: 41) explicitly state that the presence of the augment
 12 on numerals often results in a definite interpretation, and this idea is also reflected in the
 13 English translation of (4b) provided by Ashton et al.

14 (4) Ganda (Ashton et al. 1954: 387)

- 15 a. e-m-buzi bbiri e-n-nungi
 16 AUG₁₀-NPr₁₀-goat 10.two AUG₁₀-APr₁₀-fine
 17 ‘two fine goats’
- 18 b. e-m-buzi (e-)n-nungi e-bbiri
 19 AUG₁₀-NPr₁₀-goat (AUG₁₀-)APr₁₀-fine AUG₁₀-10.two
 20 ‘the two fine goats’

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

24 (5) Haya (Wald 1973: 253; citing Rascher 1958)

- 25 a. o-mu-ntu mu-rungi
 26 AUG₁-NPr₁-person NPr₁-beautiful
 27 ‘the good looking **pérson**’

⁵ See Idiatov (to appear, Section 6.5.1.2) for a similar proposal regarding the function of the nominalizer *mə̀* in the Jarawan Bantu language Mbula [mbu] (Nigeria).

1 a. o-mu-ntu o-mu-rungi
 2 AUG₁-NPr₁-person AUG₁-NPr₁-beautiful
 3 ‘the **góod-lòoking** pèrson’

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

17 (6) Haya (Byarushengo 1977: 13)
 18 e-n-jú z-anje i-bily’ êz’ é-zi-lúŋgi
 19 AUG₁₀-NPr₁₀-house PPR₁₀-my EPr₁₀-two 10.these AUG₁₀-APr₁₀-good
 20 ‘these two good houses of mine’

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

⁶ We saw in Table 1 that this order is also attested in Mbugwe.

1 (7) Haya (Kuijpers 1922: 142)

2 a. w-aa-bona e-n-ju y' o-mw-aami e-nungi?

3 VPr_{2SG}-PST-see AUG₉- NPr₉-house CON₉ AUG₁- NPr₁-chief AUG₉-9.beautiful

4 'Have you seen the **beautiful** house of the chief?'

5 b. w-aa-bona e-n-ju y' o-mw-aami, (okw e-li) nungi?

6 VPr_{2SG}-PST-see AUG₉- NPr₉-house CON₉ AUG₁- NPr₁-chief, how VPr₉-be 9.beautiful

7 'Have you seen the house of the chief, (how) it is beautiful?'

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

17 Where the preceding facts suggest a localizing-selective use of apposed modifiers, versus a
18 quantifying or qualifying use in any alternative adnominal construal, Givón claims that
19 augmented adjectives are used non-restrictively in Bemba examples such as (2b) (1974: 132–
20 135). Still according to Givón, this same non-restrictive use of adjectives is signaled by
21 sentence-final position in Ganda, which can give rise to discontinuous nominal expressions
22 (8).

23 (8) Ganda (Givón 1974: 135)

24 a. o-mu-sajja o-mu-rungi agenze

25 AUG₁-NP₁-man AUG₁-NP₁-good left

26 'The good man left.' (restrictive)

⁷ 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).

1 b. o-mu-sajja agenze o-mu-rungi
2 AUG₁-NP₁-man left AUG₁-NP₁-good
3 ‘The man left, the good one.’ (non-restrictive)

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

14

15 **3. Word order: variation, freedom and discontinuity**

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

25 *3.1. Patterns of word order variation across languages and constructions*

26 Although certain modifiers can precede the noun in some languages (see below), most
27 adnominal modifiers follow the noun in the Bantu languages. The order of postnominal
28 modifiers can be rigid or flexible. Flexibility is usually restricted to a subset of modifiers and
29 combines with a fixed position in phrase-final and/or immediately postnominal position for
30 another modifier. In Basaa [bas] and Eton [eto] (Cameroon), for instance, if a possessive

1 pronoun, an adjective, a genitive, a cardinal number and a demonstrative are all in postnominal
 2 position, the mutual ordering of the first four is syntactically free, while the demonstrative has
 3 to come at the end (9-10).

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

5 (10) Eton (Van de Velde 2008: 227)

6 a. N {POSS, NUM, GEN} DEM

7 b. m̀̀púb mé ηkúηkú má mé¹bá

8 m̀̀púb m̀́ = ñ-kúηkú má m̀́-bă

9 NPr₆-field CON₆ = NPr₃-chief PPr₆-two

10 c. m̀̀púb mé¹bá mé ηkúηkú má

11 m̀̀púb m̀́-bă m̀́ = ñ-kúηkú má

12 NPr₆-field PPr₆-two CON₆ = NPr₃-chief

13 ‘the two fields of the chief’

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

18 (11) a. N POSS ADJ DEM

19 b. N POSS {NUM, ADJ, DEM}

20 Such crossconstructional variation in word order rigidity has also been reported for the
 21 Machame language [jmc] (Tanzania). According to Rugemalira (2007: 139–141), the mutual
 22 ordering of a demonstrative, a possessive pronoun, a cardinal number, an ordinal number and
 23 the quantifier ‘all’ is as in (12a), showing partial flexibility. When an adjective is added, the
 24 order between the quantifiers becomes more rigid (12b).⁸

⁸ 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 crossconstructional differences in word order rigidity.

- 1 (12) a. N DEM POSS {NUM, ORD, ‘all’}
 2 b. N DEM POSS (ADJ) NUM (ADJ) ORD (ADJ) ‘all’

3 Discontinuous nominal expressions appear to be very rare. I only found examples in
 4 descriptions of Ganda (see example 6b), Chichewa and Tunen and do not know how frequent
 5 they are in these languages. In Chichewa [nya] (Malawi, Zambia, Mozambique), they can be
 6 used to signal a contrastive topic interpretation on the part of a nominal expression that is left-
 7 dislocated (Mchombo, Morimoto & Féry 2005). Discontinuous expressions are subject to a
 8 number of constraints in Chichewa. First, one part of them always has to be in clause-initial
 9 position. Second, chunks that consist of more than one word are subject to the rigid word
 10 order found in integral noun phrases. In (13c) and (13e), for instance, the order of the
 11 demonstrative and the adjective cannot be switched. It is identical to the order of those
 12 elements in the integral noun phrase in (13a). Third, only the core grammatical relations of
 13 subject and primary object can be expressed by means of a discontinuous nominal expression
 14 and discontinuous nominal expressions have to be indexed on the verb by means of a prefix,
 15 underlined in (13b-f). The examples in (13) show every possible construal of the nominal
 16 expression ‘these foolish hunters’ in primary object position.

17 (13) Chichewa

18 a. Njúchií izi zi-ná-lúm-á álenje awa ópúsa N DEM ADJ
 19 10.bees 10.these 10-PST-bite-FV 2.hunter 2.these 2.foolish
 20 ‘These bees bit these foolish hunters.’

21 b. awa njúchií izi zi-ná-wá-lúm-a álenje ópúsa DEM (...) N ADJ
 22 c. álenje njúchií izi zi-ná-wá-lúm-a awa ópúsa N (...) DEM ADJ
 23 d. álenje awa njúchií izi zi-ná-wá-lúm-a ópúsa N DEM (...) ADJ
 24 e. awa ópúsa njúchií izi zi-ná-wá-lúm-a álenje DEM ADJ (...) N
 25 f. álenje ópúsa njúchií izi zi-ná-wá-lúm-a awa N ADJ (...) DEM

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

1 (14) m̀̀-ńá ìm̀̀t̀̀ ỳ̀ m̀̀ẁ̀ǹ̀íí íńdí m̀̀-ńéń ò h̀̀-íóńát̀̀
2 VPr_{1sg}-PST 9.calabash CON₉ 6.water give.PST NPr₉-big LOC NPr₁₉-child
3 ‘I gave the BIG water calabash to the child.’

4 Many languages scattered throughout the Bantu domain allow some types of modifiers to be
5 in prenominal position, either optionally or obligatorily, depending on the language and the
6 modifier. Typically, these are demonstratives (Van de Velde 2005), possessive pronouns,
7 ‘each, every’ (Rugemalira 2007: 138) and/or ‘other’. Interestingly, the set of modifiers that
8 can occur in prenominal position more or less coincides with the set of modifiers that are
9 closest to the head noun when they follow it, suggesting that they are most resistant to
10 undergoing the AMAR mechanism crosslinguistically. This may have something to do with
11 their inherently selective semantics.

12 Prenominal demonstratives are relevant for the AMAR mechanism in that they are at the
13 origin of the augment, a morpheme that has already been mentioned in section 2, and that will
14 frequently come back in the remainder of this paper. The augment is a prefix that precedes
15 the class prefix of nouns and whose shape usually varies with it. The conditions of use of
16 augments are language specific and tend to be syntactically determined (de Blois 1970; Van
17 de Velde 2019: 247–255). In general, it is easier to list the environments in which the augment
18 is absent than those in which its presence is required (Hyman & Katamba 1993). The function
19 of the augment that is most relevant for the AMAR mechanism is that it can be used in many
20 languages to nominalize an adnominal modifier, much like articles in languages such as French
21 and Dutch. This is illustrated with Nande data [nnb] (DRC, Uganda) for a possessive pronoun
22 (15b) and a qualifying adjective (15d).

1 (15) Nande (Valinande 1984: 642, 709, 714)

2 a. ð-mù-kìrá γw-á:-yɔ

3 AUG₃-NPr₃-tail PPr₃-CON-PRO₉

4 ‘his tail’ (possessor of class 9)

5 b. ɛ-γw-á:-yɔ

6 AUG₃-PPr₃-CON-PRO₉

7 ‘his one’

8 c. ð-mù-tí mù-kúhí

9 AUG₃-NPr₃-tree NPR₃-short

10 ‘the short tree’

11 d. ð-mù-kúhí

12 AUG₃-NPr₃-short

13 ‘the short one’

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

24 (16) a. u-lw-ala

25 AUG₁₁-NPr₁₁-grindstone

26 ‘the grindstone’

27 b. lu-lw-ala

28 PPr₁₁-NPr₁₁-grindstone

29 ‘the very grindstone’ or ‘just the grindstone’

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

4 *3.2. The position of possessive pronouns*

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

11 (17) a. Nande: N POSS NUM ADJ DEM (Valinande 1984: 633)

12 b. Chimpototo: N POSS NUM ADJ DEM (Botne 2019: 709)

13 c. Nkore-Kiga: N POSS DEM ADJ NUM (Taylor 1985: 55)

14 d. Ikoma: N POSS DEM ADJ NUM (Aunio et al. 2019: 516)

15 e. Haya: N POSS NUM DEM ADJ (Byarushengo 1977: 13)

16 f. Mbugwe: N POSS NUM DEM ADJ (Wilhelmsen 2019: 559)

17 g. Digo: DEM N POSS NUM ADJ (Nicolle 2013: 29, 81)

18 Possessive pronouns are localizing modifiers, which have scope over classifying, qualifying
19 and quantifying modifiers. According to Rijkhoff (2008: 800), the linear ordering of modifiers
20 tends to iconically reflect their scopal relations, meaning that the recurrent immediately
21 postnominal position of possessive pronouns in the Bantu languages is deeply anti-iconic. This
22 suggests that possessive pronouns are most resistant to being construed as a nominalized
23 element in apposition, i.e. that it is at the bottom of an apparent AMARizability hierarchy.⁹ In
24 the next section we will see that possessive pronouns are most closely syntactically linked to
25 the head noun in terms of agreement as well.

⁹ 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)).

1 4. Agreement

2 The Bantu languages are well known for their alliterative agreement patterns. Almost every
3 modifier agrees in noun class with the modified noun. In this section I argue that two aspects
4 of noun class agreement within nominal expressions are likely to have been shaped by the
5 AMAR mechanism, most clearly the existence of multiple paradigms of agreement markers
6 (4.1) and perhaps also the ubiquity of semantic agreement (4.2). The phenomenon of
7 “agreement with the neighbor” is an interesting instantiation of non-integrity of nominal
8 expressions, but it is extremely rare in the Bantu languages and not clearly linked to the
9 AMAR mechanism. It is mentioned for the sake of exhaustivity in 4.3.

10 *4.1. The origin of paradigms of agreement markers.*

11 Proto-Bantu has been reconstructed with five paradigms of agreement prefixes, three of which
12 are relevant for agreement in nominal expressions (Meeussen 1967: 97). They are represented
13 for classes 1 to 10 in Table 2. The prefix paradigms are named after their most prominent host
14 in Bantu studies. Nominal Prefixes (NPr) attach as overt class markers to nouns. They are also
15 often used to mark agreement on the small sets of qualifying adjectives found in the Bantu
16 languages and Meeussen reconstructs this use in Proto-Bantu too. The Numeral Prefixes (EPr)
17 are reconstructed as a set of prefixes that mark agreement on agreeing cardinal numbers
18 (typically ‘1-5’) and on the interrogative modifier ‘how many’. Pronominal Prefixes (PPr)
19 have the widest distribution and are used to mark class agreement on demonstratives,
20 possessive pronouns, some relative verb forms and genitive (aka connective) relators, among
21 others. The two other prefix paradigms reconstructed for Proto-Bantu, Verbal Prefixes (VPr)
22 and Object Prefixes (OPr), are used to index subjects and objects on the verb. They can occur
23 in relative verb forms, but they are not used to mark noun-phrase internal agreement in that
24 case.

SG	NPr	EPr	PPr		PL	NPr	EPr	PPr
cl 1	mù-	(ù-)	jù-		cl 2	bà-	bá-	bá-
cl 3	mù-	(ú-)	gú-		cl 4	mì-	(í-?)	gí-
cl 5	ì-	dí-	dí-		cl 6	mà-	(á-?)	gá-
cl 7	kì-	kí-	kí-		cl 8	bì-	bí-	bí-
cl 9	n-	(ì-)	jì-		cl 10	n-	í-	jí-
...					...			

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

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

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

20 The AMAR mechanism provides a plausible straightforward explanation for the extreme
21 variation in this domain and especially for the proliferation of paradigms of adnominal
22 agreement prefixes in the Bantu languages. According to the AMAR scenario, agreement

1 prefixes are created out of agreeing nominalizers. These are typically weak demonstratives
 2 (today often identified as augments), but other pronominal forms can be used as nominalizers
 3 too, such as personal pronouns, called *substitutives* in Bantu studies. When a nominalizer
 4 emerges in front of an already existing agreement prefix, the two will coexist for a while as
 5 an augment + agreement marker succession. Eventually, this succession can be formally
 6 simplified through a merger of the two prefixes, which creates a new paradigm. Evidence for
 7 this evolutionary path abounds in the Bantu languages. I will here give three illustrations: the
 8 paradigm of Pronominal Prefixes in Simbiti as compared to that of the other Mara varieties,
 9 the emergence of paradigms of Relative Prefixes throughout Bantu, and the differences
 10 between Nominal Prefixes and the prefixes used to mark agreement on adjectives that can be
 11 found all over the Bantu domain.

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

18

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-) γu-	go-	o-	go-	gu-
4	gi-	(i-) γi-	ge-	ye-	ge-/j-	gi-
5	ri-	(i-) ri-	re-	re-	re-	ri-
6	ga-	(a-) γa-	ga-	ya-	ga-	ga-

19 Table 3: Paradigms of Pronominal Prefixes in six Mara varieties (abridged from Aunio et al.
 20 2019: 517). Languages are represented by their ISO 639-3 code: [cwa] Kabwa, [ssc] Simbiti,
 21 [ngq] Ngoreme, [ntk] Ikoma, [ikz] Ikizu, and [zak] Zanaki.

22 The second illustration concerns the prefixes used in relative verb forms to mark agreement
 23 with the relativized noun. Most descriptions of Bantu languages stick to the traditionally
 24 known agreement paradigms, rather than recognizing language-specific ones when the data

1 ask for it. Unexpected patterns in paradigms on specific agreement targets are therefore often
 2 described in terms of mixed paradigms. These “mixed” paradigms may have the tones of one
 3 paradigm and the segmental forms of another one, for instance, and/or may contain prefixes
 4 seemingly taken from different paradigms. Nsuka-Nkutsi’s (1982) extensive comparative
 5 study of Bantu relative clause constructions dedicates its longest chapter to determining
 6 whether the relative verbs in the languages of his sample have a prefix from the VPr paradigm
 7 or from the PPr paradigm, or a mixture of both. However, in many languages the more
 8 accurate description would recognize a dedicated paradigm of Relative Prefixes (RPr), which
 9 results from the merger of an agreeing relativizer and a following subject prefix as part of the
 10 Bantu Relative Agreement (BRA) cycle (Van de Velde to appear). The BRA cycle is an
 11 instance of the AMAR mechanism in those cases where a relativizer starts its life as a
 12 nominalizer in an appositional construction.

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

27 (18) Punu (Blanchon 1980: 116)

- 28 a. mu-tu [águ(-)gu-tsi-ráriga yikǔtu]
 29 NPR₁-person DEM₁(-)*RPr*₁-PST-sew garment
 30 ‘someone who sewed the garment’

1 b. mu-tu [águ-tsi-ráriga yikùtu]
 2 NPr₁-person RPr₁-PST-sew garment
 3 ‘someone who sewed the garment’

4 The third and last illustration of the emergence of new paradigms of agreement markers fueled
 5 by the AMAR mechanism concerns adjectives. Although this is rarely pointed out explicitly,
 6 prefixes that are used to mark agreement on adjectives also belong to dedicated agreement
 7 paradigms in several Bantu languages. An oft-found situation is one in which Adjectival
 8 Prefixes are identical to Nominal Prefixes, except in classes 9 and/or 10, where they are
 9 identical to the Pronominal Prefixes or look like a PPr-NPr- succession, or are segmentally
 10 like a PPr but tonally like an NPr. Baka (2000: 348, 363–365) reports this for the languages
 11 Lundu [bdu], Basaa [bas] (Cameroon), Tsogo [tsv] (Gabon), Doko [bwl], Ngombe [ngc],
 12 Holoholo [hoo], Tembo [tbt], Dzing [diz] (DRC), Pogolo [poy], Mwera [mwe] (Tanzania),
 13 Lenje [leh], Soli [sby] (Zambia), Kwanyama [kua], and Luyi [lyn] (Angola, Namibia). Table
 14 4 shows part of the relevant paradigms for Holoholo and Tsogo.

	Holoholo				Tsogo		
	NPr	APr	PPr		NPr	APr	PPr
1	mù-	mù-	ù-		mù-	mú-	ù-
3	mù-	mù-	gú-		mù-	mú-	ú-
4	mì-	mì-	gí-		mì-	mí-	mí-
6	mà-	mà-	gá-		mà-	má-	má-
9	N-	gì-	gí-		N-	íN-	ì-
10	N-	gì-	gí-		N-	díN-	dí-

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

16 The augment is usually formally identical to the PPr in the Bantu languages and is generally
 17 subject to a process of attrition whereby it first loses its initial consonant, then its entire
 18 segmental form and finally its tone. What must have happened in the languages listed above
 19 is that a succession of a nominalizing augment and a NPr was reduced by deletion of the
 20 augment in those classes where it was the first of a succession of prosodically weak syllabic

1 agreement prefixes. It was maintained in classes 9 and 10, because these originally had a non-
2 syllabic nasal prefix, thereby leaving a trace of a completed cycle of accretion followed by
3 attrition.

4 4.2. *Semantic agreement within the noun phrase*

5 Another characteristic of agreement in the Bantu languages for which the AMAR mechanism
6 might provide a diachronic explanation is the fact that semantic agreement reaches every
7 position on the agreement hierarchy, including most adnominal targets. We speak of semantic
8 agreement, as opposed to syntactic agreement, when the choice of agreement pattern depends
9 on the meaning of the controller noun, rather than on its morphological class as defined by an
10 overt class marker (Corbett 1979). The best known case of semantic agreement in Bantu
11 linguistics is the use of the agreement patterns of class 1 (SG) and 2 (PL) with animate
12 controllers, whatever their overt class marker (Wald 1975, Maho 1999: 124).¹⁰ In the classic
13 Swahili example in (19a), the noun *ki-boko* ‘hippopotamus’ has a nominal prefix of class 7,
14 but it triggers semantic agreement in the form of a class 1 prefix on the demonstrative and on
15 the object marker in the verb. In contrast, the inanimate noun *ki-su* ‘knife’ triggers syntactic
16 class 7 agreement on all agreement targets in (19b).

17 (19) Swahili [swh] (Tanzania, Kenya, ...) (Wald 1975: 241-242)

18 a. yu-le ki-boko ni-li-mw-ona
19 PPr₁-DEM NPR₇-hippo VPr_{1SG}-PST-OPr₁-see-FV
20 ‘That hippo, I saw it.’

21 b. ki-le ki-su ni-li-ki-on-a
22 PPr₇-DEM NPR₇-knife VPr_{1SG}-PST-OPr₇-see-FV
23 ‘That knife, I saw it.’

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

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.

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

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

14 (21) Swahili (Wald 1975: 283–284)

15 a. ng'ombe z-a-ngu wa-me-fika
16 10.cow PPr₁₀-POSS_{1SG} VPr₂-PERF-arrive
17 'My cows have arrived.'

18 b. rafiki y-angu a-me-fika
19 9.friend PPr₉-POSS_{1SG} VPr₁-PERF-arrive
20 'My friend has arrived.'

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

25 (22) Kami (Wald 1975: 300)

26 ka-ronda ng'ombe dz-angu n-hulu / wa-kulu
27 VPr₁-like 10.cow PPr₁₀-1SG.POSS NPR₁₀-big / NPR₂-big
28 'He likes my big cows.'

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

4 (23) Lunda (Kawasha 2003: 98)

5 Yena, kansi wenza haloshi.

6 yena ka-ansi wu-a-inz-a haloshi

7 3SG.PRO NPR₁₂-child VPr₁-PST-come-FV yesterday

8 ‘The child came yesterday.’

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

13 (24) Lunda (Kawasha 2003: 112, 109)

14 a. káwa kámi

15 ka-wa ka-ámi

16 NPR₁₂-dog PPr₁₂-1SG.POSS

17 ‘my dog’

18 b. kasumbi katata

19 ka-sumbi ka-a-tata

20 NPR₁₂-fowl PPr₁₂-CON-my.father

21 ‘the fowl of my father’

22 (25) Lunda (Kawasha 2003: 108)

23 ñombi wamwisaña

24 ñombi wu-a-mu-i-saña

25 9.cow PPr₁-CON-NPr₁₈-NPr₅-bush

26 ‘a buffalo’

27 The Lunda data thus show a link between type of modification and agreement type. If there
28 is indeed an amarizability hierarchy and if it is correct that more inherently selective modifiers
29 are less likely to be touched by the AMAR mechanism, then the Lunda facts too suggest a
30 link between AMAR and semantic agreement within nominal expressions. Since the

1 agreement hierarchy is basically a hierarchy of syntactic distance (Corbett 1979), semantic
2 agreement on a modifier is more likely to occur when this modifier is apposed than when it
3 is adnominal. Whether or not semantic agreement within nominal expressions can be
4 considered a trace of AMAR remains to be demonstrated, e.g. by means of a comparative
5 study of any systematic links between word order and semantic agreement.

6 *4.3. Agreement with the neighbor*

7 The section on word order discussed two phenomena that may be indicative of the relative
8 non-integrality of nominal expressions in the Bantu languages, namely word order freedom
9 among adnominal modifiers (quite frequent) and discontinuity (very rare). Neither of these is
10 clearly linked to the AMAR mechanism, which may nevertheless have facilitated their
11 emergence. There is a very rare similar phenomenon that has to do with agreement and that
12 could be called agreement with the neighbor. The only examples that I know are from
13 Kwakum [kwu] (Cameroon). In an integral noun phrase one would expect there to be a single
14 controller of agreement on non-embedded modifiers. In the Kwakum example in (26),
15 however, the demonstrative has the choice to agree in class with its semantic head ‘houses’
16 (26a) or with the number ‘two’ that quantifies ‘houses’, and that has its own gender
17 specification. The second option suggests an appositional structure, literally translatable as
18 ‘the houses, these two’.

19 (26) Kwakum (Njantcho Kouagang 2018: 166)

20 a. ñtóó ìbáà mí⁺ké

21 ñ-tóó^L ì-báà^H mí-ké^L

22 NPR₆-house NPR₂-two PPr₆-DEM

23 b. ñtóó ìbáà jí⁺ké

24 ñ-tóó^L ì-báà^H jí-ké^L

25 NPR₆-house NPR₂-two PPr₂-DEM

26 ‘these two houses’

27 To summarize, Section 4 pointed out how Bantu languages differ greatly from each other in
28 the number and shape of their paradigms of prefixes that mark gender agreement on adnominal
29 modifiers and argued that at least some of this variation is due to the addition of agreeing
30 nominalizers that merge with the existing prefixes. In fact, the AMAR mechanism may well

1 be responsible for the very existence of exuberant alliterative agreement in Bantu nominal
 2 expressions, a hypothesis that would need to be verified in the larger Benue-Congo family. It
 3 also pointed out a link between the frequent immediately postnominal position of possessive
 4 pronouns and the fact that they are the last agreement target to resist semantic agreement,
 5 explainable if we assume that possessive pronouns are the modifiers that are most resistant to
 6 the AMAR mechanism. In the next section, we look at a third characteristic of nominal
 7 expressions in the Bantu languages that is arguably shaped by the AMAR mechanism, namely
 8 the existence of strong and unexpected prosodic boundaries within nominal expressions.

9 **5. Prosodic boundaries in nominal expressions**

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

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

25 (27) Tonga

- 26 a. φ (kú-⁴bókó kw-á ⁴mú-kàìntù)
 27 NPR₁₅-arm PPR₁₅-CON 1-woman
- 28 b. φ (kú-bòkò) φ (í-⁴kw-á mú-kàìntù)
 29 NPR₁₅-arm AUG-PPR₁₅-CON 1-woman
 30 'the arm of a woman'

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

4 *5.1. Prosodic boundaries in Makonde nominal expressions*

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

10 (28) Makonde of Zanzibar (Rolle & Hyman 2019; citing Manus 2003; 2018)

11 a. φ (língéela) φ (líkúmeene)

12 lí-ngéla lí-kúmêne

13 NPR₅-mango NPR₅-big

14 ‘a big mango’

15 b. φ (viloongo) φ (viviili)

16 vi-lôngo vi-víli

17 NPR₈-pot PPR₈-two

18 ‘two pots’

19 (29) 1φ modifiers

20 φ (vílóngó aviilá)

21 ví-lóngó avilá

22 NPR₈-pot 8.DEM

23 ‘those pots’

¹¹ 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.

- 1 (30) 1 ~ 2 φ modifiers
 2 a. φ (sǐjǔlú saángu)
 3 sí-jǔlú s-ángu
 4 NPr₇-hat PPr₇-1SG.POSS
 5 ‘my hat’
 6 b. φ (sǐjǔlú) φ (sáangu)
 7 sí-jǔlú s-ángu
 8 NPr₇-hat PPr₇-1SG.POSS
 9 ‘a hat of mine’

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

13 (31) DEM / POSS > ADJ > NUM

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

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

1 (32) Makonde of Zanzibar (Manus 2018)
 2 φ (vi-lo \underline{o} ngo) φ (vi-k \underline{u} me \underline{e} ne) φ (vy-á na \underline{a} swe) φ (vi-vi \underline{i} li)
 3 NPR₈-pot APR₈-big PPr₈-CON white APR₈-two
 4 ‘two big white pots’

5 (33) φ (vi-l \underline{o} ngó vi-k \underline{u} méné vy-á nás \underline{w} é vi-vi \underline{i} li avi \underline{i} lá)
 6 NPR₈-pot APR₈-big PPr₈-CON white APR₈-two 8.DEM
 7 ‘these two big white pots’

8 (34) φ (li-jembé ly-a \underline{a} ko) φ (lí-díki \underline{i} ki)
 9 NPR₅-hoe PPr₅-2SG.POSS APR₅-small
 10 ‘your small hoe’

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

22 (35) 1φ or 2φ determined by:

23 Demonstratives: word class

24 Adjectives and numbers: word class & construction

25 Possessive pronouns: construction & type of modification

26 5.2. Prosodic boundaries in Chichewa nominal expressions

27 A variation on this theme is found in Chichewa, which has a similar split in the prosodic
 28 properties of adnominal modifiers and where phonological phrases are also demarcated by
 29 penultimate vowel length (Downing & Mtenje 2011). The absence of prosodic boundaries
 30 within syntactic units appears to be the norm in Chichewa, as shown by the fact that the

1 ditransitive clause in (36) forms a single phonological phrase. All Chichewa examples are
2 from Downing and Mtenje (2011).

3 (36) φ (a-lendó a-na-dyétsa a-nyaní nsóomba)
4 NPr₂-visitor VPr₂-TAM-eat.CAUS NPr₂-baboon 10.fish
5 ‘The visitors fed the baboons fish.’

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

8 (37) a. φ (nyama yáthú íina)
9 9.meat 9.1SG.POSS 9.other
10 ‘our other meat’

11 b. φ (ma-dengu éná oónse)
12 NPr₆-basket 6.other 6.all
13 ‘all the other baskets’

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

20 (38) φ (alendó a-na-dyétsa a-nyaní á-saanu) φ (á-á-kúulu) φ (nsóomba)
21 2.visitor VPr₂-TAM-eat.CAUS NPr₂-baboon EPr₂-five CON₂-APr₂-big 10.fish
22 ‘The visitors fed five big baboons fish.’

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

26 (39) φ (a-galú áthú á-á-kúulu) φ (óonse)
27 NPr₂-dog 2.1SG.POSS CON₂-APr₂-big 2.all
28 ‘all our big dogs’

1 *4.3. Prosodic boundaries in Rutooro nominal expressions*

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

8 Just as in Makonde and Chichewa, Rutooro adnominal modifiers can be divided into different
9 types depending on their prosodic properties, but where Makonde and Chichewa have two
10 types, Rutooro has three. Possessive pronouns, genitives, numbers, adjectives and the
11 modifiers ‘another’, ‘many’ and ‘how many’ correspond formally to Chichewa 2φ modifiers,
12 because they create a prosodic boundary to their right, but not to their left (38). The mutual
13 ordering of such modifiers is free (40 a-b), except that the possessive pronoun has to be in
14 immediately postnominal position (40c).¹² Phonological phrases are demarcated by high pitch
15 on their penultimate syllable in Rutooro.

16 (40) modifiers that create a prosodic boundary to their right: Type -MOD) φ

17 a. φ (a-ma-iba a-sátu) φ (gáá-ndi)

18 AUG₆-NPr₆-dove EPr₂-three PPr₆-another
19 ‘another three doves’

20 b. φ (a-ma-iba gáá-ndi) φ (a-sátu)

21 AUG₆-NPr₆-dove PPr₆-another EPr₂-three
22 ‘another three doves’

23 c. φ (e-bi-cuumbiro by-áánge) φ (bí-íngi) / *bííngi byáánge

24 AUG₈-NPr₈-kitchen PPr₈-1SG.POSS PPr₈-many
25 ‘many kitchens of mine’

26 The second type of Rutooro modifiers corresponds formally to Makonde 2φ modifiers, in that
27 they create a prosodic boundary to their right and to their left. Demonstratives and the modifier

¹² The absence of a left hand side prosodic boundary is marked by a hyphen in the schematic representations of modifier types: -MOD) φ .

1 ‘all’ belong to this type. In a sense, the situation in Rutooro appears to be the inverse from
2 that in Makonde, where demonstratives are prosodically most closely integrated in the noun
3 phrase.

4 (41) modifiers that create a prosodic boundary to their right and left: Type (MOD) φ

5 φ (e-ki-sumurúzo) φ (kí-nu)

6 AUG₇-NPr₇-key PPr₇-this

7 ‘this key’

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

11 (42) modifiers that do not create prosodic boundaries: Type -MOD-

12 φ (a-ba-ana ba-ruungi ba-sóm-a)

13 AUG₂-NPr₂-child APr₂-good VPr₂-read-FV

14 ‘good children who read’

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

19 (43) a. φ (e-ki-tábu) φ (e-ki-rúúngi)

20 AUG₇-NPr₇-book AUG₇-APr₇-good

21 ‘the good book’

22 (translated as ‘the book that is good’ by Clemens & Bickmore’s consultant)

23 b. φ (a-báá-ntu) φ (a-ba-sóm-a)

24 AUG₂-NPr₂-people AUG₂-VPr₂-read-FV

25 ‘the people who read’

26 A final relevant observation about Rutooro is that non-subject relative clauses without an
27 augment also belong to prosodic Type (MOD) φ when they have a lexical subject (44).

1 (44) φ (o-mw-áána) φ (a-ba-limi ba-ta-góónz-a)
 2 AUG₁-NPr₁-child AUG₂-NPr₂-farmer VPr₂-NEG-like-FV
 3 ‘the child that the farmers don’t like’

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

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

21 5. Conclusions

22 Despite their close genealogical relatedness, the Bantu languages show a bewildering amount
 23 of variation in the structure of their nominal expressions. Much of this variation is
 24 typologically unusual. This is most famously the case for some of the attested word order
 25 patterns, but the existence of prosodic boundaries between nouns and their modifiers that are
 26 stronger than those between constituents of the clause in Chichewa, the presence of
 27 determiner-like elements (“augments”) on adnominal modifiers and the proliferation of
 28 paradigms of agreement markers are typologically remarkable too. The comparative word
 29 order facts have pushed typologists such as Rijkhoff to suggest that nominal expressions may
 30 not be integral noun phrases in the Bantu languages. However, there are few synchronic

1 indications for non-integrality of NPs in the individual Bantu languages, if any. According to
2 the AMAR hypothesis, this situation is due to two tendencies with opposite effects on the
3 integrality of noun phrases. The first of these is a tendency for appositional structures to
4 emerge. These usually imply a nominalizer that derives an independent referring expression
5 from an adnominal modifier. This nominalizer is almost always an agreeing element of
6 demonstrative or pronominal origin. The second tendency is for these apposed semantic
7 modifiers to be reintegrated into a more rigidly structured noun phrase. The erstwhile
8 nominalizer is thereby reinterpreted as a mere agreement marker and tends to erode or merge
9 with the agreement marker that was already present on the modifier.

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

17

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