Scrambling in the nominal domain: Evidence from the Chichewa DP

Abstract: Chichewa DPs are noun-initial and the modifiers following the noun may occur in any order. Assuming that Chichewa nouns invariably undergo N-to-D movement and that a universal structural hierarchy of the modifiers maps into left-to-right linear order (e.g., Dem≫Num≫Adj), this paper argues that the order flexibility of nominal modifiers in Chichewa involves scrambling of the modifiers, whose landing site is a position that does not involve a canonical Spec-head featural relation. Two data patterns are discussed: (i) Novel ellipsis data show that while a structurally higher modifier may license the ellipsis of a lower modifier, the reverse does not hold even though the relative linear order between the modifiers is free; (ii) an asymmetry is attested regarding hybrid concord, in that a structurally higher modifier of a hybrid noun may show semantic concord while a lower modifier shows morphological concord, whereas the reverse pattern is not possible. After a brief comparison with two alternative analyses of the order flexibility, namely Cinque 2005 and Carstens 2008, 2017, the paper concludes that the Chichewa facts are overall best captured by the scrambling account. It thus confirms that scrambling is not just a clause-level phenomenon; it also exists in the nominal domain.

1. Order flexibility in Chichewa DP

In Chichewa, as in many other Bantu languages, the noun in general linearly goes first in a DP, with all its modifiers following it (Mchombo 2004:24).[1] The relative order of the modifiers, however, is highly flexible (Downing & Mtenje 2017:27), with some preferential restrictions of specific types of modifiers to be discussed below; it is often difficult to tell which of the possible orders is the 'basic' one. To begin with, the flexibility regarding DP-internal constituent order in Chichewa is exemplified by (1), where every logically possible order of the demonstrative, the numeral, and the adjective (a–f) gives an expression that can naturally occur in out-of-the-blue contexts. Additionally, all orders in (1) allow for contrastive focusing of any element in the sequence (see Carstens 2017 for a similar observation regarding Shona DPs). For example, all the expressions in (1) can be placed in the underlined part of (2), yielding six sentences, each of which can be used to answer any of the three questions in (3–5), as indicated by the translations in (2). The boxed elements in (3–5) represent the information that is corrected by the focused modifiers in (2). In other words, any of the orders in (1) can be used in (2), regardless of which modifier is contrastively focused:[2]

(1) a. zi-péwá iizi zi-táatu zá-zí-kúulu [N≫Dem≫Num≫Adj]
8-hats 8.these 8-three 8-8-big
b. zipéwá zitáatu iizi zázíkúulu [N≫Num≫Dem≫Adj]
c. zipéwá zitáatu zázíkúulu iizi [N≫Num≫Adj≫Dem]
d. zipéwá iizi zázíkúulu zitáatu [N≫Dem≫Adj≫Num]
e. zipéwá zázíkúulu iizi zitáatu [N≫Adj≫Dem≫Num]
f. zipéwá zázíkúulu zitáatu iizi [N≫Adj≫Num≫Dem]
'these three big hats'

(2) Íyaayi, ndi=ná=gúla _____.
no 1P.SG=PST=buy
'No, I bought THESE three big hats.' *or*
'No, I bought these THREE big hats.' *or*
'No, I bought these three BIG hats.'

[1] Demonstratives and some quantifiers can occur prenominally in many other Bantu languages, e.g., Swahili (Carstens 1991) and Shona (Carstens 2017). Also, some Bantu languages like Tsonga have a prenominal focus position inside DP (Lee & Riedel 2023). These options are not available in Chichewa, whose DP is strictly N-initial.

[2] Unless stated otherwise, all Chichewa data in this paper are from my own fieldnotes with two Chichewa speakers (data from the literature, where references are given, are also confirmed by my consultants). In transcribing Chichewa, I follow Downing & Mtenje's (2017) transcription system; when necessary, the cited data are also adapted for consistency. Note that the penult vowel of a prosodic phrase-final element is automatically lengthened (indicated as vowel doubling), as reflected in the examples.

The following abbreviations are used in the glosses: 1P = first person, 2P = second person, ASSOC = associative, PST = past tense, Q = question marker, SG = singular; SM = subject marker; prefixal numbers indicate noun classes and agreement/concord associated with noun classes.

(3) Kodí u=ná=gúla [zi-péwá iizo zi-táatu zá-zí-kúulu]?
Q 2P.SG=PST=buy 8-hats 8.those 8-three 8-8-big
'Did you buy those three big hats?'

(4) Kodí u=ná=gúla [zi-péwá iizi zi-wíili zá-zí-kúulu]?
Q 2P.SG=PST=buy 8-hats 8.these 8-two 8-8-big
'Did you buy these two big hats?'

(5) Kodí u=ná=gúla [zi-péwá iizi zi-táatu zá-zí-ng'óono]?
Q 2P.SG=PST=buy 8-hats 8.these 8-three 8-8-small
'Did you buy these three small hats?'

Using different types of modifiers does not change the general picture, though some preferential restrictions regarding pronominal possessives and relative clauses will be addressed later in this paper (see also Carstens 1997:374–376, Downing & Mtenje 2017:27), to be accounted for with independent PF factors. For now, it can be safely assumed that the linear order in Chichewa DP per se is largely independent from considerations of information structure—all the possible orders in (1) may be viewed as 'basic' in this functional sense. The question remains, however, of how to derive such flexibility formally in the grammar. I address this issue in this paper, and argue that despite the surface flexibility, there is a fixed c-commanding hierarchy (which mirrors the merge order) that maps to a left-to-right linear order. I will assume that the hierarchy Dem>Num>Adj>N is a universal one (Cinque 2005, Abels & Neeleman 2012),[3] and that the noun in Chichewa undergoes N-to-D movement (which is responsible for the strict N-initiality of DP; see Carstens 1991, 1997). In (1), only (1a) (where the modifier order is Dem≫Num≫Adj) directly reflects the base-generated positions of the modifiers. And crucially, I argue that the other orders (1b–f) deviating from Dem≫Num≫Adj all result from the DP-internal scrambling of modifiers, which will be discussed in detail in the following.

The proposed account partially resembles Cinque's (2005) influential antisymmetry-based study, because the basic antisymmetry assumptions are kept, e.g., structural hierarchy maps into left-to-right linear order invariantly; the specifier always precedes its head; and movement can only be leftward (Kayne 1994; note that these assumptions are not all primitive). However, it differs from Cinque (2005) in that for him, DP-internal movement always involves a phrase containing N, while for us, the order of modifiers is adjusted simply via scrambling, without pied-piping the noun, N-to-D being a different operation that is independently needed.

Two pieces of evidence are discussed. First, in Section 2, I provide novel ellipsis data showing that although under the Num≫Adj order, the numeral can license ellipsis of the adjective, the adjective cannot license ellipsis of the numeral under the reverse Adj≫Num order (other types of modifiers will be tested, showing parallel asymmetrical results). Assuming that the ellipsis of a phrase XP requires a featural relation between a head Y and the specifier of Y, Y c-commanding XP (Lobeck 1990, 1995, Saito & Murasugi 1990), the asymmetry between adjectives and numerals is immediately captured if Num≫Adj is base generated while Adj≫Num is a result of scrambling, given that the landing site of scrambling does not involve a Spec-head featural relation (Fukui 1993, Saito & Fukui 1998, Saito 2003, 2004).[4] The technical details of this analysis will be spelled out. Second, Section 3 discusses a case of hybrid concord within Chichewa DP initially documented by Corbett (1991:239). A number of Chichewa nouns morphologically belong to a certain noun class while they show semantic properties typical of another class. For example, *ngwázi* 'hero'

[3] I use > for asymmetric c-command and ≫ for linear precedence, respectively.

[4] The term 'scrambling' is used to refer to very different kinds of phenomena in the literature (see in this respect Bošković 2004a). I will only use the term for Japanese-style scrambling in the current paper. The cited authors argue that (Japanese-style) scrambling is not feature-driven and thus does not induce a canonical Spec-head featural relation, which, following the authors in question, I take to be the defining property of scrambling; that is, it is non-feature-driven movement. See de Hoop 2003, Kim 2003, and Gong 2022 for analyses of scrambling as non-feature-driven movement in languages other than Japanese. Note that it is presupposed in this paper (as well as in the works cited above) that not every instance of internal Merge is parasitic on Agree (as also stated in Chomsky 2000:107–108; 2008:140–141), which is argued for by a number of authors on the basis of different empirical cases; see, e.g., Haegeman 1996, Roberts & Roussou 2002, Roberts 2004, Jouitteau 2008, and Blümel 2017. See Section 2 for detailed discussion of how the notion fits with the Chichewa data.

is morphologically of noun classes 9/10, whereas the default noun classes for human nouns are classes 1/2.[5] These so-called hybrid nouns can trigger either morphological or semantic concord with their modifiers. As in (6a), the two modifiers of *ngwázi* 'hero' show class 9 morphology, in accordance with the morphological class of the noun; in (6b), by contrast, the modifiers convey meaning-based class 1 concord, i.e., the default option for singular human nouns:

(6) a. ngwází ya=thú y-óyáamba
9.hero 9ASSOC=our 9-first
'our first hero'
b. ngwází wa=thú w-óyáamba
9.hero 1ASSOC=our 1-first
c. ngwází ya=thú w-óyáamba
9.hero 9ASSOC=our 1-first
d. * ngwází wa=thú y-óyáamba
9.hero 1ASSOC=our 9-first (Corbett 1991:239)

Interestingly, there can be a mismatch when a hybrid noun takes two modifiers: It is possible for one modifier to show morphological concord and the other to show semantic concord (6c). However, a gap exists: The modifier that is more distant to the noun cannot show morphological concord if the other modifier closer to the noun shows semantic concord, as demonstrated by the ungrammaticality of (6d).

With the help of additional novel data in Section 3, I will show that the relative distance of nominal modifiers to the noun can only be stated in terms of a universal structural hierarchy of those modifiers (Dem>Num>Adj>N being part of it). The surface linear order of modifiers never plays a role in hybrid concord. It will be shown that the concord facts are expected directly under the scrambling analysis of order flexibility.

After presenting the core arguments in favor of the scrambling analysis, Section 4 addresses some interesting restrictions on the order flexibility in Chichewa DP: (i) Pronominal possessives prefer to occur immediately following the noun, and (ii) relative clauses are often located at the right periphery of DP. I will show that these preferences are phonologically conditioned, in fact consistent with the scrambling account to be argued for in this paper in a natural way.

In Section 5 I examine two alternative explanations of DP-internal linear order flexibility: (i) Cinque's (2005) antisymmetry-based account, and (ii) Carstens's (2008, 2017) proposal that nominal modifiers are essentially adjuncts and can be either left- or right-adjoined to intermediate projections within DP, resulting in different surface orders. While the alternatives share with the scrambling account the view that the merge order of nominal modifiers obeys the aforementioned universal hierarchy, it will be argued that the scrambling account should be preferred, at least for Chichewa, as it is not only empirically more adequate, but it also derives the constituent order facts in Chichewa in a more straightforward way.

Section 6 concludes the paper. To the extent that it is successful, this study can be taken as confirmation that scrambling, which is generally discussed in the literature as a clause-level phenomenon, also exists in the nominal domain.

2. N'-ellipsis and the scrambling account

As already mentioned, DP-internally, the order of the nominal modifiers is highly flexible in Chichewa. I focus on adjectives and numerals first. As further illustrated in (7), both Num≫Adj (7a) and Adj≫Num (7b) are possible orders postnominally:

(7) a. zi-péwá zi-táatu z-óyéela
8-hats 8-three 8-white
'three white hats'
b. zi-péwá z-óyéela zi-táatu
8-hats 8-white 8-three

[5] Bantu noun class morphology encodes both number and gender features (Carstens 1991, Corbett 1991). Count nouns typically belong to a pair of noun classes of the same gender, where the odd numbered class is singular and the even numbered class is plural.

However, despite the apparent free order alternation in (7), there is in fact a fixed structural hierarchy between adjectives and numerals in Chichewa, as confirmed by the pattern in (8–9). Both (9a) and (9b) can naturally follow (8) (the modifier order in (8) does not matter); nevertheless, note that (9a) implies that Chikondi bought three *white* hats, whereas (9b) crucially only implies that Chikondi bought *any number* of white hats, not necessarily three:

(8) Mavúuto a=ná=gúla [zi-péwá z-óyéela zi-táatu] / [zi-péwá zi-táatu z-óyéela] …
1.Mavuto 1SM=PST=buy 8-hats 8-white 8-three 8-hats 8-three 8-white
'Mavuto bought <u>three white hats</u> …'

(9) a. … Cikóndíí=nsó a=ná=gúla zi-táatu.
1.Chikondi=also 1SM=PST=buy 8-three
lit. 'Chikondi also bought three.' (implication: Chikondi bought *three white* hats)
b. … Cikóndíí=nsó a=ná=gúla z-óyéela.
1.Chikondi=also 1SM=PST=buy 8-white
lit. 'Chikondi also bought white.' (implication: Chikondi bought *white* hats)

Since *white* is interpreted though not pronounced in (9a), (9a) must involve ellipsis. As in (10), an intermediate phrase XP within DP which includes the adjective *zóyéla* 'white' and the head noun while excluding the numeral *zitátu* 'three' gets elided (I abstract away from the exact labels of XP and YP here, for ease of exposition), under the identity condition that both the adjective and the noun are 'recoverable' from (8) (I will use the traditional term 'N'-ellipsis' to refer to all cases that involve the ellipsis of a certain intermediate projection smaller than DP (cf. Jackendoff 1971), though no theoretical inference should be drawn from the literal meaning of the term; the DP hypothesis is presupposed for Bantu nominals throughout):

(10) [$_{DP}$ [$_{YP}$ zitátu ~~[$_{XP}$ zóyéla zipéwa]~~]]

(10) assumes that the head noun in such cases get elided without moving out of its in-situ position (we thus observe the absence of the noun in (9a)). As observed by Lasnik (1999b), certain cases of head movement that normally have to take place do not occur if the head of concern is part of an elided phrase. One such case is sluicing. As in (11), assuming that sluicing involves TP-ellipsis after *wh*-movement (Lobeck 1990, 1995, Saito & Murasugi 1990), the T head *will* that normally undergoes T-to-C movement in *wh*-questions does not move out if TP is elided:

(11) A: Mary will see someone.
B: a. Who ~~[$_{TP}$ Mary will see]~~? (cf. *Who Mary will see?)
b. *Who will ~~[$_{TP}$ Mary see]~~? (cf. Who will Mary see?) (Lasnik 1999b)

Another case is pseudogapping (12), which Lasnik (1999ab) argues involves VP-ellipsis. The relevant structure of (12) is represented in (13a). Lasnik argues for an overt object shift analysis of English, on which both the object and the verb move out of the VP in English (see also Johnson 1991, Koizumi 1995, Bošković 1997, among many others). In (13a), the object *Smith* overtly undergoes object shift (Koizumi 1995, Lasnik 1999a), so that it is outside the elided VP:

(12) The DA proved Jones guilty and the Assistant DA will Smith …

(13) a. … and the Assistant DA will [$_{vP}$ Smith$_j$ ~~[$_{VP}$ prove Smith$_j$ guilty]~~].
(cf. *… and the Assistant DA will Smith prove guilty.)
b. *… and the Assistant DA will [$_{vP}$ prove$_i$ Smith$_j$ ~~[$_{VP}$ prove$_i$ Smith$_j$ guilty]~~].
(cf. … and the Assistant DA will prove Smith guilty.)

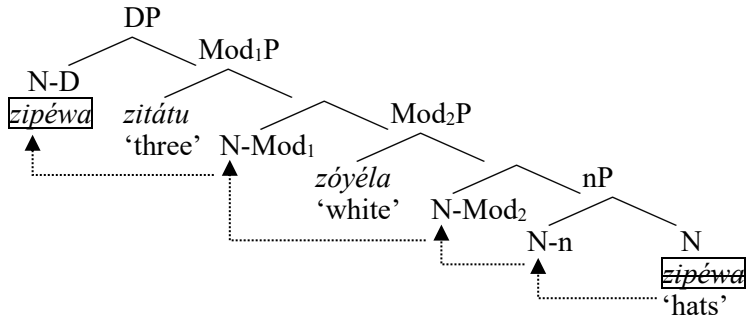
Importantly, while the verb normally raises above the shifted object, such head movement fails to happen in cases of pseudogapping/VP-ellipsis (13b). The generalization, then, is that ellipsis may bleed overt head movement. While an in-depth investigation of this issue lies outside the scope of the current paper, and I will simply take it to be a descriptive observation,[6] it seems reasonable to suggest that N'-ellipsis in

[6] Lasnik (1999b) argues that the head of concern carries a strong feature, which, as an illegible PF object, must be checked via head movement to avoid a PF crash (Chomsky 1993); when ellipsis (arguably a PF operation) happens,

Chichewa (10) involves the same phenomenon. That is, assuming that N-initiality of the Chichewa DP is a result of N-to-D movement (see Section 5 for further discussion), when N'-ellipsis happens, the noun does not move to D; it gets elided in its in-situ position.

What is interesting here is that (9b) does not behave parallel to (9a), the latter involving N'-ellipsis: Due to the interpretation of (9b) (i.e., *white hats*, rather than *three white hats*), it can be concluded that (a phrase containing) *zitátu* 'three' has not undergone ellipsis in this case. Such asymmetry between adjectives and numerals is accounted for if the base-generated position of the numeral invariantly c-commands that of the adjective. As in (14), the N≫Num≫Adj order in (7a) *zipéwá zitáatu zóyéela* results from N-to-D head movement, with the two modifiers externally merged as the specifiers of two intermediate functional phrases, labeled for convenience as Mod_1P (hosting the numeral in its specifier) and Mod_2P (hosting the adjective), respectively, the former dominating the latter:

(14)



Notice that Chichewa nominal modifiers all show overt noun class concord morphology with the noun (Mchombo 2004:25; Downing & Mtenje 2017:25). I assume concord and canonical agreement at the clause level involve the same mechanism, namely Agree (see Carstens 2020 and references therein for discussion of this ongoing debate). First, I follow Kramer 2015 in assuming that gender features reside on n, which is directly responsible for the noun class morphology on the noun (see Ferrari 2005, Carstens 2020, and Fuchs & van der Wal 2022 for specific discussion of Bantu; cf. fn.5). Second, the relevant phi-features on n must be 'transmitted' to higher heads within DP, including the Mod heads as well as D, during the derivation (see Danon 2011 on how different phi-features are distributed within DP). This is a necessary assumption, as gender features, though generated low, are visible to clause-level probes in Bantu (specifically, the verb Agrees with its DP arguments in gender features), so they must also be present on D, and naturally, also on heads between D and n (see Carstens 2011, 2017 for relevant formulations; cf. fn.7). More specifically, I suggest that the Mod heads probe their c-commanding domain for phi-features, so the gender features on n are copied onto them, via Agree (Chomsky 2000, 2001). Alongside the Agree procedures, the noun (in later steps, a complex head containing the noun) moves up step by step to the Mod heads and eventually to D, deriving N-initiality of the Chichewa DP.[7]

Third, the modifiers in (14) then merge with the corresponding ModPs. I assume that the modifiers carry unvalued phi-features (cf. Baker 2003) and are thus probes (Bošković 2011a); they Agree with the corresponding Mod heads, again via downward probing, as the latter are the closest goals.[8] The result is that the

---

the structure is already PF well-formed as the troublemaker is elided, so movement does not happen. Since nothing in this paper depends on the nature of the phenomenon, I will not pursue the idea further.

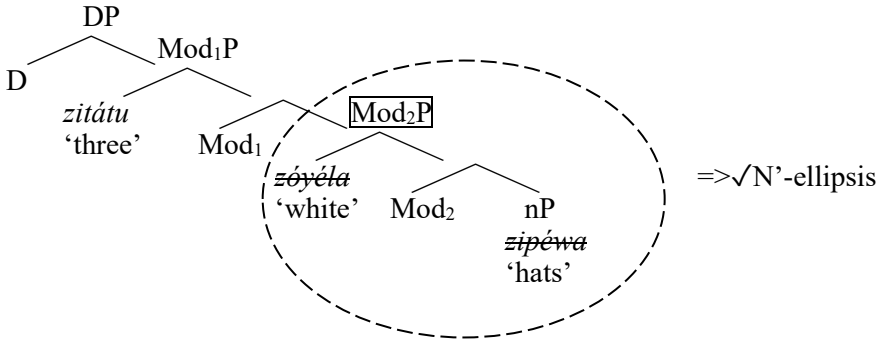
[7] This discussion implies that the featural 'transmission' along the heads via Agree is in principle independent from N-to-D movement, i.e., they are two different (steps of) operations, though it seems natural to assume that the former feeds the latter. Notice that the probing of the Mod heads (and D) may occur in cases where the noun stays low (i.e., where N-to-D does not happen)—we have seen that N-to-D does not happen in cases of N'-ellipsis, but the relevant phi-features are arguably still present on the Mod heads in those cases (see also immediately below in the text). Note that the dissociation between the featural transmission within DP and N-to-D movement makes the current analysis slightly different from Carstens 2011, 2017, where it is suggested that N-to-D per se makes the step-by-step transmission of the features to D possible.

[8] Note that the current case involves phrasal probing: The modifier in SpecModP, which may be structurally complex, acts as the probe as a whole. As illustrated in (i), suppose that the modifier is headed by a head carrying unvalued phi-features (labeled for convenience as uφ in the diagram); uφ may probe in different cycles if its features remain

relevant phi-features are copied onto the modifiers, where overt noun class concord morphology is realized accordingly.

The current discussion provides a natural way of accounting for how N'-ellipsis as in (9a) is licensed in Chichewa. As illustrated in (15), *zitátu* 'three' in SpecMod_1P and Mod_1 share the same phi-features (the former directly Agrees with the latter), hence forming a canonical Spec-head featural relation.[9] Following Lobeck 1990, 1995 and Saito & Murasugi 1990, I assume that the licensing of ellipsis requires such a featural relation between the specifier and the head whose complement is elided (see fn.11 for further discussion). Since there is a local Spec-head relation between SpecMod_1P and Mod_1, Mod_2P (which contains the adjective *zóyéla* 'white' and the head noun *zipéwa* 'hats') is elided licitly, resulting in the ellipsis effect in (9a):

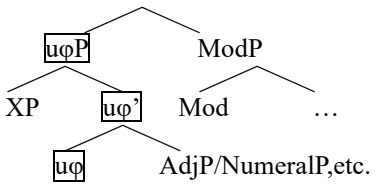
(15)



Now consider (7b), where the N≫Adj≫Num order does *not* follow from a left-to-right mapping of the proposed Num>Adj universal hierarchy. Under the assumption that linear precedence consistently reflects asymmetrical c-commanding relations (i.e., the antisymmetry hypothesis; Kayne 1994; see Section 5 for further discussion), (7b) must involve the lower adjective moving across the higher numeral. The relevant structure is represented in (16), where the movement in question is identified as scrambling, whose landing site is the specifier position of a projection which I simply label as FP, for reasons that are given immediately below (16):

unvalued in the previous cycles (see below). Note that under Bare Phrase Structure (Chomsky 1995ab), uφ, uφ', and uφP in (i) are the same element uφ in different cycles; that I label them differently is no more than a notational convention:

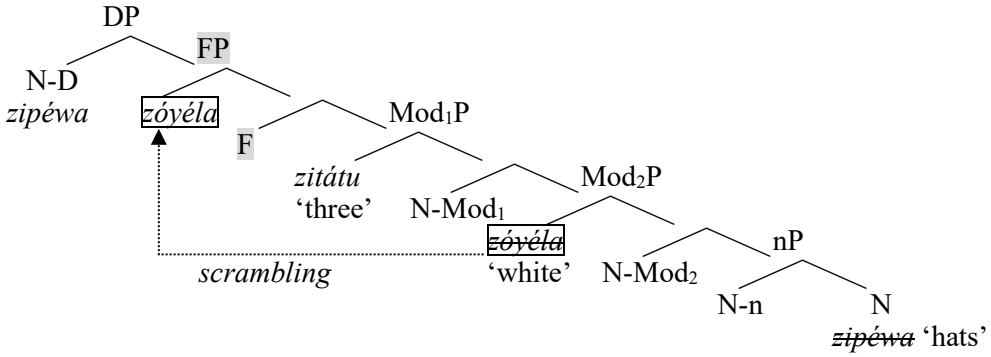
(i)



The idea that an 'unsatisfied' probe may reproject and probe again is not new; see Béjar 2003, Řezáč 2003, and Béjar & Řezáč 2009. Carstens (2020) proposes an analysis of Bantu nominal concord that is similar to (i) (she also discusses why uφ does not copy phi-features from its complement, an important component of the analysis which I cannot go into here). Carstens & Diercks (2013) report that phrasal probing is attested also at the clause level in Bantu. See also Bošković 2007, 2011b, Heinat 2008, Villa-García 2012, 2015, Carstens 2016, and Clem 2023 for recent discussion from different perspectives of how phrases may probe.

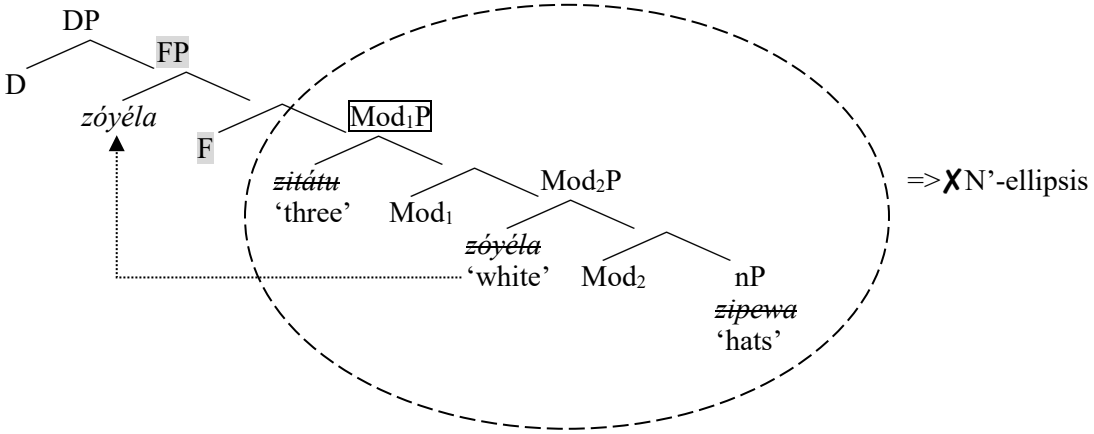
[9] Speaking in more traditional terms, SpecMod_1P and Mod_1 form a Spec-head agreement relation here, which, as the discussion in the text shows, is derived directly from Agree (Chomsky 2000, 2001).

(16)



Importantly, as the interpretation of (9b) suggests, the raised adjective in SpecFP cannot license the ellipsis of the complement of F, namely Mod_1P (17). That is, SpecFP and SpecMod_1P differ in that they display distinct properties with respect to ellipsis licensing: As illustrated in (15), the latter can license the ellipsis of Mod_2P (i.e., the complement of Mod_1).

(17)*



If SpecMod_1P licenses ellipsis because it involves a traditional Spec-head featural relation with the head it merges with, namely Mod_1, as suggested above, the inability of SpecFP to license the ellipsis of the complement of F suggests that there is no such a featural relation between SpecFP and F in (16/17). Now, as noted in fn.4 that, following Fukui (1993), Saito & Fukui (1998), Saito (2003, 2004), among others, movement whose landing site does not involve a Spec-head featural relation (i.e., non-feature-driven movement) is defined as scrambling. In the current context, this means that by definition, the movement of the adjective *zóyéla* 'white' into SpecFP is a genuine case of scrambling in (16/17), because there is no Spec-head relation between F and the adjective in SpecFP. In other words, F does not Agree (that is, it does not probe its c-commanding domain for phi-features), and is thus featurally vacuous in (16/17). (Note, as discussed above, that the concord morphology on the scrambled adjective is already licensed in its base-generated position.)

An alternative approach to scrambling views scrambling as involving adjunction (Mahajan 1990, Saito 1992, Tada 1993, among others). Under this approach, the scrambled adjective in (16) would be adjoined to Mod_1P (SpecMod_1P being the base-generated numeral; there would be no separate projection FP). Since the scrambled adjective (being an adjunct) does not Agree, the discussion above applies similarly. I will proceed adopting (16) though nothing essential would change if the alternative were adopted.[10]

[10] If one takes labeling into consideration, there is in fact little to no real difference between the FP approach and the adjunction approach to scrambling. Suppose that the maximal projections within DP are each labeled by feature-sharing (as they involve a {XP, YP} structure in the sense of Chomsky 2013; see Carstens 2020 for discussion of labeling regarding nominal modifiers); because F by definition does not contain the relevant features for labeling, it is a weak head in the sense of Chomsky 2015 (see also Saito 2016). Since F does not participate in labeling, the projection referred to as FP in (17) must in fact be labeled by the feature-sharing between the modifier in SpecFP and Mod_1P (they necessarily carry the same phi-features, following the discussion above), thus (what is called) FP is technically an extended projection of Mod_1P, making the structure in (17) parallel to one that involves adjunction.

To summarize, it is clear now why the adjective cannot license the ellipsis of the numeral under the Adj≫Num order, as (9b) manifests. In (17), *zóyéla* 'white' is base generated in SpecMod$_2$P and then undergoes scrambling to SpecFP, c-commanding Mod$_1$P. Since the movement in question involves scrambling, there is no Spec-head relation here, hence N'-ellipsis cannot be licensed.[11]

The contrast between (9a) and (9b) regarding ellipsis effects is thus accounted for. Before ending this section, I would like to point out that a similar asymmetry is found if one tries other types of modifiers. For example, in (18–19), where (19) follows (18), only (19a) shows the ellipsis effect in question (that is, (19b) does not imply that the white goats are beautiful); since evaluative adjectives have been shown to be located higher than color adjectives cross-linguistically (Cinque 2010; cf. *beautiful black goats* vs. *??black beautiful goats* in English), the contrast between (19a) and (19b) is expected under the scrambling analysis, i.e., while the Adj$_{evaluative}$≫Adj$_{color}$ order can be base generated, the Adj$_{color}$≫Adj$_{evaluative}$ order must involve modifier scrambling:

(18) Ndí=dyétsa [mbúzí zá-kúuda z-ókóngoola] / [mbúzí z-ókóngoola zá-kúuda] …
1P.SG=feed 10.goats 10-black 10-beautiful 10.goats 10-beautiful 10-black
'I will feed beautiful black goats ...'

(19) a. … Mavúuto á=dyétsa z-ónyáansa.
1.Mavuto 1SM=feed 10-ugly
lit. 'Mavuto will feed ugly.' (implication: Mavuto will feed *ugly black* goats.)
b. … Mavúuto á=dyétsa z-óyéela.
1.Mavuto 1SM=feed 10-white
lit. 'Mavuto will feed white.' (implication: Mavuto will feed *white* goats.)

Similarly, in cases where one modifier is a numeral and the other is a possessive (20–21), the numeral may license ellipsis of the possessive (21a), but not vice versa (21b).[12] This confirms Carstens's (2020) independently grounded argument that the possessive in Bantu is base generated low in the structure; specifically, possessives are argued to be merged at SpecnP (as they are argument-like), and are thus lower than all other modifiers base generated in the middle field (cf. the diagram in (14)).

Either way, the scrambled element would not be able to license ellipsis, thus capturing the N'-ellipsis pattern discussed in this section.

[11] The current discussion may be stated differently if a different theory of ellipsis licensing is adopted. For instance, Merchant (2001) and Aelbrecht (2010) posit an [E] feature on the head right above the ellipsis site. As a reviewer suggests, under this analysis, the distinction between (15) and (17) can be made in a way such that the Mod heads may carry the [E] feature whereas F cannot, the latter being featurally vacuous. A natural suggestion here is that [E] is always parasitic on other features. As modeling ellipsis licensing in a different way does not lead to different empirical consequences in the scope of the current paper, I will proceed adopting the Spec-head approach (Lobeck 1990, 1995 and Saito & Murasugi 1990), a widely assumed descriptive generalization regarding ellipsis licensing (see also Kester 1996, Martin 2001, Sato 2014, Bošković 2016, Griffiths & den Dikken 2022, among many others, where the same assumption is adopted on different empirical grounds).

[12] Carstens (1997:374–376) reports that regarding lexical possessives in Chichewa, only N≫Num≫Poss is possible while N≫Poss≫Num is not, while pronominal possessives (counterparts of English *his*, *my*, etc.) only allow the reversed N≫Poss≫Num order. However, my consultants in fact allow both orders for both types of possessives (see Section 4 for detailed discussion).

Note also that, as expected, lexical possessives and pronominal possessives behave similarly regarding ellipsis; (i&ii) below are minimally different from (20&21) in that the possessives are pronouns. Their interpretation shows the same asymmetry between the possessive and the numeral:

(i) Mavúuto a=ná=gúlitsa [zi-thúunzi zi-táatu záa=ke] …
1.Mavuto 1SM=PST=sell 8-pictures 8-three 8ASSOC=his
'Mavuto$_i$ sold his$_i$ three pictures …'

(ii) a. … Cikóndíí=nsó a=ná=gúlitsa zi-táatu
1.Chikondi=also 1SM=PST=sell 8-three
lit. 'Chikondi$_j$ also sold three.' (implication: Chikondi$_j$ sold *his*$_{i/j}$ *three* hats.)
b. … Cikóndíí=nsó a=ná=gúlitsa zi-táatu
1.Chikondi=also 1SM=PST=sell 8-three
lit. 'Chikondi$_j$ also sold his.' (implication: Chikondi$_j$ sold *his*$_{i/j}$ hats.)

(20) Mavúuto a=ná=gúla zi-péwá zi-táatu zá=Táyamíika …
1.Mavuto 1SM=PST=buy 8-hats 8-three 8ASSOC=Tayamika
'Mavuto bought three hats of Tayamika's …'

(21) a. … Cikóndíí=nsó a=ná=gúla zi-táatu.
1.Chikondi=also 1SM=PST=buy 8-three
lit. 'Chikondi also bought three.' (implication: Chikondi bought *three* hats *of Tayamika's*.)
b. ... Cikóndíí=nsó a=ná=gúla zá=Táyamíika.
1.Chikondi=also 1SM=PST=buy 8ASSOC=Tayamika
lit. 'Chikondi also bought Tayamika's.' (implication: Chikondi bought hats *of Tayamika's*.)

Finally, it should be noted that the presence of a demonstrative would cancel the ellipsis effect for independent semantic reasons, i.e., one cannot detect the ellipsis effect in any case where a demonstrative is used in the DP in question (see Adger et al. 2021, where it is suggested that a demonstrative presupposes that the object referred to is identifiable; cf. in English *I will carry these six large boxes, and you can carry those four*, which does not imply that *those four boxes* are large). Consequently, the tests used in this section cannot directly help us determine the position of demonstratives. However, in the absence of evidence to the contrary, I suggest that Chichewa demonstratives are merged obeying the well-established Dem>Num>Adj>N hierarchy, which, if scrambling does not occur, maps left-to-right into linear order; scrambling alone gives the orders where other modifiers precede the demonstrative as we observed in (1). To put it all together, the types of postnominal modifiers that we have discussed in this section constitute the following hierarchy as well as the base-generated linear order in Chichewa (recall that nouns invariably undergo N-to-D movement):

(22) (N>) Dem > Num > $Adj_{evatuative}$ > Adj_{color} > Poss (> N)

3. Hybrid concord and the cycle of Agree

We have briefly touched upon the hybrid concord phenomenon in Chichewa in Section 1. As shown in (6), repeated below as (23), the hybrid noun *ngwázi* 'hero' can trigger either morphological concord (6a/23a) or semantic concord (6b/23b) (recall that *ngwázi* 'hero' is formally of class 9, while class 1 is the default class for (singular) human nouns; see fn.5). Importantly, the two modifiers in (23) may show mixed concord, namely the possessive takes morphological concord whereas the adjective takes semantic concord, as in (23c) (the ordinal *yóyámba*/*wóyámba* 'first' is morphologically an adjective). Notice, again, that the reversed hybrid pattern is disallowed (23d):

(23) a. ngwází ya=thú y-óyáamba
9.hero 9ASSOC=our 9-first
'our first hero'
b. ngwází wa=thú w-óyáamba
9.hero 1ASSOC=our 1-first
c. ngwází ya=thú w-óyáamba
9.hero 9ASSOC=our 1-first
d. * ngwází wa=thú y-óyáamba
9.hero 1ASSOC=our 9-first (Corbett 1991:239)

Based on this type of data, Corbett (1991:239) gives the generalization (24), noting that similar patterns are found cross-linguistically (targets and controllers correspond to probes and goals in minimalist terms, respectively):[13]

(24) When stacked targets of a given controller stand in different agreement forms, the further target will show semantic agreement. (Corbett 1991:239)

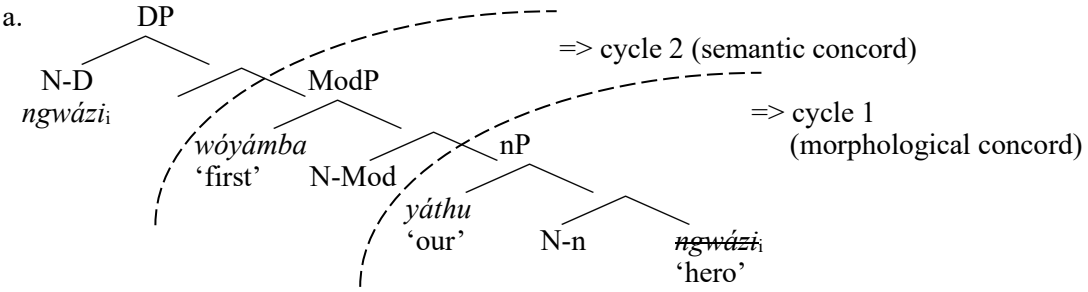
[13] (24) can actually be understood in terms of *agreement hierarchy*, discovered by Corbett (1979) himself. Although Corbett's original version does not consider directly different types of nominal modifiers (the further to the left an element on the hierarchy attributive>predicate>relative pronoun>personal pronoun is, the more likely morphological agreement is to happen, the further to the right it is, the more likely semantic agreement is), the principle is the same: The farther an element is from its agreement controller, the easier it shows semantic agreement.

However, recall that N-initiality in Chichewa/Bantu is assumed to result from N-to-D head movement (see also Section 5). This means that in (23), it is not immediately clear which modifier is closer to the noun, as the noun gets fronted in the syntax. Recall also from the last section that possessives are first merged in SpecnP, a position lower than adjectives. However, the Poss≫Adj order in (23) seems to reflect the reversed Poss>Adj hierarchy, as expected under the now familiar antisymmetry assumption that structural hierarchy consistently maps into left-to-right linear order (see Section 5 for further discussion). The conclusion, then, is that the the Poss≫Adj order in (23) must involve movement—in the current analysis the scrambling of the possessive. One then may wonder how the asymmetry of mixed concord interacts with the Adj≫Poss order, which reflects the base-generated positions of the two modifiers. Now, as illustrated by the novel data in (25), under the Adj≫Poss order, it is still possible for the possessive to bear morphological concord and the adjective to agree semantically, but not the other way around (for my consultants, (25a–c) are not entirely natural—thus the question marks, for independent reasons to be discussed in Section 4):

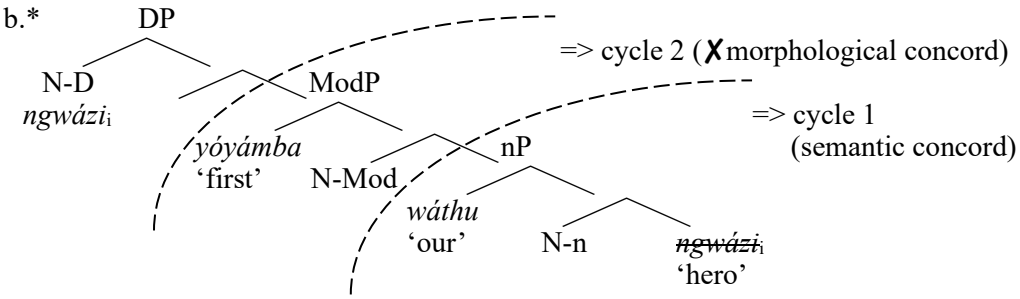
(25) a. ? ngwází y-óyáamba yáa=thu
9.hero 9-first 9ASSOC=our
'our first hero'
b. ? ngwází w-óyáamba wáa=thu
9.hero 1-first 1ASSOC=our
c. ? ngwází w-óyáamba yáa=thu
9.hero 1-first 9ASSOC=our
d. * ngwází y-óyáamba wáa=thu
9.hero 9-first 1ASSOC=our

That is, the linear order of the modifiers is irrelevant in conditioning the hybrid concord pattern, as in both Poss≫Adj (23) and Adj≫Poss (25) orders, it is not possible for a hybrid noun to be modified by a semantically agreed possessive and a morphologically agreed adjective at the same time. Consider the contrast between (25c) and (25d), both reflecting the base-generated Adj≫Poss order and involving hybrid concord; assuming that both types of concord involve downward probing of the modifier, which happens immediately at the point the modifier is merged into the structure, the structures of (25c) and (25d) can be represented as (26a) and (26b), respectively:

(26) a.



b.*



Derivationally speaking, then, while (26a) shows that morphological concord happening before semantic concord causes no problems, the opposite semantic-concord-before-morphological-concord order is not a possibility (26b). Although exploring the nature of this asymmetry lies outside the scope of this paper (see Smith 2015, 2017, Landau 2016 for different views), regarding the distribution of morphological concord

and semantic concord in Chichewa, (24) may be restated as in (27); the condition of distance in (24) is now understood in terms of the timing of the Agree process:

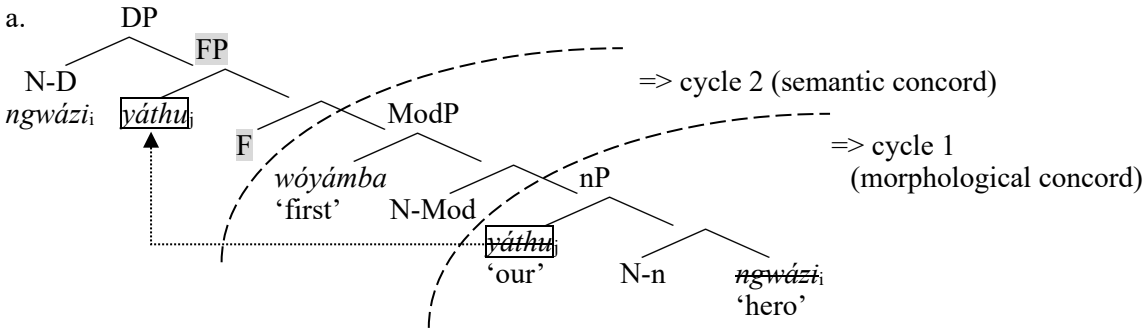
(27) A goal cannot induce morphological concord if it has triggered semantic concord earlier in the derivation.

That is, when two probes α and β both Agree with a goal X, if α is merged and Agrees with X before β enters the structure and α shows semantic agreement, morphological agreement is not available for β. Combining the generalization (27) and the scrambling account explored in Section 2, it is clear now why the surface alternation of the modifier order does not affect the hybrid concord pattern (23&25). The derivation of (23c) and (23d) (repeated below as (28a) and (28b)) is illustrated in (29) (only relevant cycles are annotated). In cycle 1 in (29a), the pronominal possessive *yáthu* 'our' is base generated in SpecnP; it is in a Spec-head relation with the noun in n and the output is morphological concord. The adjective *wóyámba* 'first' is merged in cycle 2, where the output of Agree between SpecModP and N-Mod is class 1 morphology, i.e., semantic concord. The possessive is then scrambled to SpecFP above the adjective, but this time, crucially, a new Spec-head featural relation is not established, as discussed in Section 2. In contrast, (29b) is ungrammatical because here semantic concord happens before morphological concord, violating (27):[14]

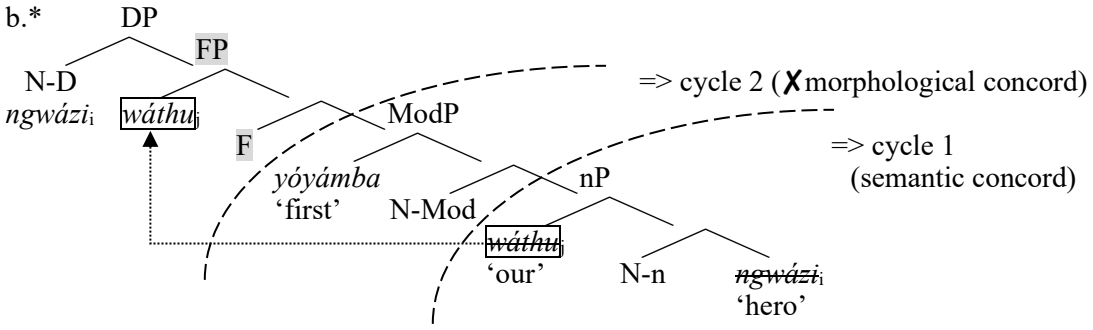
(28) a. ngwází ya=thú w-óyáamba
9.hero 9ASSOC=our 1-first
'our first hero'

b. * ngwází wa=thú y-óyáamba
9.hero 1ASSOC=our 9-first

(29) a.



b.*



In summary, as formulated in (27), whenever hybrid concord happens, it strictly happens in the morphological-concord-before-semantic-concord time sequence, never the other way around. The hybrid concord pattern is thus nicely captured by the scrambling account of the order flexibility of nominal modifiers in Chichewa.

[14] Since F does not probe for phi-features as discussed above, a natural expectation is that N-to-D movement will not proceed through F. This apparent violation of the Head Movement Constraint is not problematic-as the locality condition of head movement is feature-relativized in current syntactic theory, and F is by definition featurally vacuous.

4. Restrictions on Chichewa free modifier order

We have seen that the scrambling account provides a natural explanation of the two new observations: (i) Whenever a modifier A may license the ellipsis of a modifier B (when A linearly precedes B), B cannot license the ellipsis of A, even though without ellipsis, B may also occur preceding A; (ii) the hybrid concord phenomenon in the Chichewa DP are governed by the types of the modifiers, with linear order playing no role. Notice now that the DP-internal order flexibility in Chichewa does actually have some restrictions. For example, recall that (25a–c) with the N≫Adj≫Poss order appears slightly less natural than (23a–c) with the scrambled N≫Poss≫Adj order, the possessive being pronominal in all these examples. Carstens (1997) reports that there seems to be a linear order asymmetry between pronominal possessives and lexical possessives in Chichewa (see however fn.12): While a pronominal possessive like *cá=nga* 'my' reportedly must immediately follow the modified noun and precede other modifiers, a lexical possessive like *cá=mavuto* 'of Mavuto's' has to occur DP-finally. However, for my consultants, locating the pronominal possessive immediately after the noun is just a preference ((25a–c) are acceptable), and putting lexical possessives after other modifiers is actually a very subtle preference that is difficult to detect (see further fn.19). Note additionally that Downing & Mtenje (2017:27) state that '[pronominal] possessives preferentially immediately follow the noun,' also implying that it is indeed a preference, rather than a mandatory requirement.

Carstens (2008, 2020) proposes that though both types of possessives are base generated at SpecnP, pronominal possessives then move to the middle field of DP, possibly to SpecNumP (the essence of the movement is not discussed). For the data reported in the current paper, the raising of the possessive should be viewed as an optional operation and may apply to both pronominal and lexical possessives. Under the current analysis, the raising is simply a case of DP-internal scrambling: There is nothing special with pronominal possessives in narrow syntax, compared to other types of modifiers, though there is a preference for locating pronominal possessives preceding other modifiers. Particularly, note that pronominal and lexical possessives in Chichewa both involve the so-called associative construction (Downing & Mtenje 2017:26). For example, both *cá=ngá* 'my' and *cá=tamiyáka* 'Tamiyaka's' are transparently formed by combining the associative proclitic (which agrees with the possessed noun in noun class) and the possessor. Since pronominal and lexical possessives are morphological parallels in Chichewa, it is not immediately clear why they should behave differently in syntax, as suggested in Carstens 2020, where only pronominal possessives invariantly move out of SpecnP.[15] This proposed ad hoc property of the pronominal possessive is unnecessary for the current account, as discussed immediately below.

I suggest that the preference that pronominal possessives tend to immediately follow the noun is actually a PF phenomenon. A number of studies have reported that Chichewa pronominal possessives are phonologically clitic-like, different from both independent words and unambiguous clitics (Kanerva 1990, Downing & Mtenje 2011, 2017). First, most nominal modifiers in Chichewa are regularly followed by a phonological phrase break—this can be seen by penult lengthening (i.e., the penult vowel of a phonological phrase-final element is doubled; see fn.2) reflected in all Chichewa examples in this paper. As shown in (7a), repeated here with prosodic phrasing notations as (30), when a modifier immediately follows the noun, the modifier and the noun form a single phonological phrase (e.g., *zipéwá zitáátu*); modifiers in other positions form a phonological phrase by themselves (e.g., *zóyéela*) (the parentheses in (30) indicate the phonological phrase boundaries):

(30) (zi-péwá zi-táátu) (z-óyéela)
8-hats 8-three 8-white
'three white hats'

Pronominal possessives behave quite differently in this respect. Though in principle they are able to stand alone (they are disyllabic while 'canonical' clitics in Chichewa are monosyllabic—a phonological word is minimally disyllabic in Chichewa), when (and only when) they immediately follow the noun, they cliticize: As (23a), repeated here as (31), shows, there is no prosodic boundary at the right edge of the possessive;

[15] The possessor merged with the associative marker in the pronominal possessive is a monosyllabic pronominal form (e.g., *=nga* in *cá=nga* 'my') and is a full DP in the lexical possessive. This internal difference regarding the possessor should not affect the external syntax of the possessive in any obvious way.

furthermore, the modifier following the possessive forms a phonological phrase with the cliticized possessive, as well as with the noun:

(31) (ngwází ya=thú y-óyáamba)
9.hero 9ASSOC=our 9-first
'our first hero'

The patterns exemplified in (30&31) are summarized in (32), where Poss refers to pronominal possessives specifically. Note that the modifiers outside the phonological phrase containing the noun can also be a pronominal possessive:

(32) a. (Noun Mod) (Mod) (Mod) (Mod)
b. (Noun-Poss Mod) (Mod) (Mod) (Mod)

It can now be safely stated that Chichewa pronominal possessives are phonologically ambiguous between independent words and clitics (Downing & Mtenje (2017) call them 'clitic-like modifiers').[16] When the pronominal possessive is used as a clitic, it must cliticize (understood as a local morphophonological process), but this is not possible if the clitic is linearly preceded by another nominal modifier, because the modifier is always followed by a phonological phrase break (32), which I take to be an inherent property of Chichewa nominal modifiers. In other words, nominal modifiers cannot host a clitic, following the standard assumption that there cannot be a pause between a phonologically weak element and its host. Since the noun is the only element in the DP that need *not* be followed by a phonological phrase break (other than the clitic itself), it is the only potential licit host of the pronominal possessive, if the latter needs to cliticize.

Scrambling of the possessive, while being itself syntactic, consequently puts the possessive in a position where it is adjacent to the noun, and essentially feeds the cliticization of it. In other words, scrambling is obligatory for the clitic possessive if its base-generated position is not adjacent to the noun in D. The unnaturalness of (25a–c) may thus be understood as a competition effect (Cardinaletti & Starke 1999): Whenever a weaker form of the pronoun is available, a strong form is dispreferred. Note also that the pattern reported by Carstens (1997) is in fact more straightforwardly accounted for under the current analysis, by saying that the pronominal possessive is obligatorily a clitic, and thus must undergo scrambling if there is another modifier preceding it.

In fact, there are similar PF-motivated preferences with other types of modifiers. Downing & Mtenje (2017:27) observe that relative clauses in Chichewa preferentially occur DP-finally, which they note is a

[16] Note that it is cross-linguistically not uncommon to have the same form be ambiguous between a clitic and a non-clitic. For example, in Czech, the third-person singular feminine clitic *ji* is ambiguous between a clitic and a non-clitic (pronominals with other phi-features distinguish the clitic form and the non-clitic form; see Franks & King 2000:99). In fact, such ambiguity is also found in English , as discussed in Bošković 2004b. Consider (i):

(i) a. * Mary hates the students all.
b. Mary hates them all.
c. * Mary hates THEM all.
d. * Mary hates you, him and her all.

The contrast between (5a) and (5b) shows that pronouns may move higher than lexical nouns (so the former leaves an extra trace position to strand the quantifier). Bošković (2004b) argues that (ib) involves cliticization, because when the pronoun is stressed (ic) or coordinated (id), which clitic pronouns cannot do, moving the pronoun higher up, which is needed for quantifier stranding, is not possible. A similar pattern is found in Chichewa. As in (ii), while coordinated pronouns still show order flexibility (my consultants note that the coordination of pronominal possessives per se is not a preferred strategy, so (iiab) are both slightly unnatural), when they directly follow the noun (ia), they are followed by a phonological phrase break (that is, they pattern like lexical modifiers (30), not clitic-like pronominal possessives (31)), which confirms that they are not cliticized to the noun. As clitic pronouns cannot coordinate, the pattern in (ii) is expected:

(ii) a. ? (ci-thúnzí ca=ngá ndí=cáá=ké) (cá-cí-kúulu)
7-picture 7ASSOC=my and=7ASSOC=his 7-7-big
lit. 'my and his picture'
b. ? (ci-thúnzí cá-cí-kúulu) (cá=ngá ndí=cáá=ké)
7-picture 7-7-big 7ASSOC=my and=7ASSOC=his

common pattern cross-linguistically (see Hawkins 2004). This is exemplified in (33), where (33a) is slightly degraded according to my consultants. Intuitively, the preference is compatible with the well-established observation that in head-initial languages generally, phonologically heavy constituents tend to follow phonologically light ones (Hawkins 1990, 1994). While pronominal possessives are phonologically light and tend to precede all other modifiers (so that they are closest to the noun), relative clauses lie at the other extreme, and preferably occur at the right periphery of the entire DP. Note again that, similar to the case of pronominal possessives, to put relative clauses at the end of DP is a preference, not a requirement, which in every respect is highly parallel to heavy NP shift in English; (33b) thus involves scrambling of the adjective *áákúlu* 'big' across the relative clause (I follow Cinque 2010 in assuming that relative clauses are merged at a position higher than adjectives; (33a) reflects the base-generated order of modifiers):[17]

(33) a. ? ma-búkhú a-méné a=náa=gwa á-á-kúulu
6-books 6-that 1SM=PST=fall 6-6-big
'big books that fell'
b. ma-búkhú á-á-kúulu a-méné a=náa=gwa
6-books 6-6-big 6-that 1SM=PST=fall

In addition, similar phonological considerations may be involved with lexical possessives. Carstens (1997) reports that lexical possessives must occur DP-finally in Chichewa (see fn.12), but for my consultants, this is more of a preference, in fact a much weaker preference than the patterns seen with pronominal possessives and relative clauses (see (20)). Note that lexical possessives may be considered formally more complex than other types of modifiers: They involve the proclitic associative marker 'of' and the lexical possessor DP, which itself may be structurally complex. Thus, speakers who prefer to place lexical possessives DP-final may actually perceive them as phonologically heavier than other kinds of modifiers like numerals and adjectives.[18]

5. Remarks on alternative analyses

So far, we have examined two novel datasets in Chichewa, regarding N'-ellipsis and hybrid concord. The conclusion we reached is that constituent order flexibility within the Chichewa DP is a result of leftward scrambling, whose landing site does not involve a canonical Spec-head featural relation. In other words, for the basic pattern given in (1), only (1a) reflects the base-generated order of the three modifiers (i.e., Dem≫Num≫Adj); the other orders in (1b–f) all involve movement of (some of) the modifiers.

Note, however, that in order for the scrambling analysis to hold, two assumptions are crucially needed: (i) N-initiality in Chichewa DP is a result of N-to-D movement, and (ii) asymmetrical c-commanding in the syntax is directly realized as linear precedence in the phonology. As discussed in the previous sections, if both assumptions are maintained, the scrambling analysis seems to be unavoidable.

It is now important to point out that not all existing accounts of DP-internal order variations keep these assumptions. In this section I examine two alternative analyses of free modifier order within DP; one is Cinque 2005 and the other is Carstens 2008, 2017. The former essentially argues for an invariant left-to-right mapping from hierarchy but rejects head movement, while the latter argues for N-to-D head movement while rejecting the antisymmetry hypothesis (in its strictest form; see below). In the following I first present the gist of the two alternatives; I then consider their drawbacks in accounting for the Chichewa facts. The conclusion will be that the current scrambling account should be preferred.

I first address Cinque's (2005) influential typological study of the possible orders of Dem, Num, Adj, and N, which has been touched upon already in passing. Following Kayne 1994, Cinque (2005) argues that the base-generated Dem≫Num≫Adj≫N hierarchy universally maps into left-to-right order, with all orders

[17] This parallels a Kaynean approach to heavy NP shift, where the heavy NP does not move (rightward movement is banned), but is moved across by the element that precedes it in the surface order (Kayne 1994:71–77).

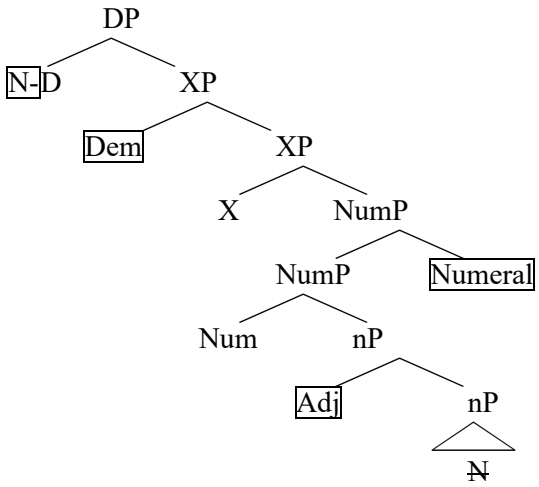
[18] As already mentioned in the text, Hawkins (1990, 1994) observes that phonologically heavy elements tend to follow phonologically light ones in head-initial languages. He also mentions that the tendency is reversed in head-final languages, where phonologically heavy constituents tend to precede light ones linearly. It is thus interesting to note that, as manifested by Imamura's (2019) corpus study, leftward scrambling in Japanese (a head-final language) occurs more frequently for phonologically longer elements. This indicates that Japanese scrambling and Chichewa scrambling are parallel not only in terms of the lack of a Spec-head relation, but also in terms of how phonological factors play a role in the distribution of scrambling in the two languages.

other than that being realized essentially via phrasal movement, which can only be leftward (the current paper also keeps these points). Importantly, for him, relevant movement steps must involve NP, or a larger projection that contains NP (i.e., modifiers do not move on their own). In other words, head movement is not involved in this system. To take the six possible orders in (1) for instance (to save space, the details below are slightly simplified), (i) the N≫Dem≫Num≫Adj order in (1a) would simply involve raising of the NP to a high specifier position, as demonstrated in (34a); (ii) N≫Adj≫Dem≫Num in (1e) would involve moving NP first to a projection right above Adj; the new NP-Adj constituent then moves to SpecDP (34b); (iii) the N≫Num≫Adj≫Dem order (1c) involves NP moving first to a position right above Num, and then the new NP-Num-Adj phrase moves across Dem (34c); (iv) N≫Adj≫Num≫Dem in (1f) is derived via successive snowballing movement: NP raises across Adj, followed by NP-Adj moving across Num, followed by NP-Adj-Num raising to a position above Dem, as illustrated in (34d):

(34) a. $[_{DP}\ NP_i\ [_{WP}\ Dem\ [_{XP}\ Num\ [_{YP}\ Adj\ \sout{NP_i}\ ]]]]$ [N≫Dem≫Num≫Adj]
b. $[_{DP}\ [_{YP}\ NP_i\ Adj\ \sout{NP_i}\ ]_j\ [_{WP}\ Dem\ [_{XP}\ Num\ \sout{[_{YP}\ NP_i\ Adj\ NP_i\ ]_j}]]]$ [N≫Adj≫Dem≫Num]
c. $[_{DP}\ [_{XP}\ NP_i\ Num\ [_{YP}\ Adj\ \sout{NP_i}\ ]]_j\ [_{WP}\ Dem\ \sout{[_{XP}\ NP_i\ Num\ [_{YP}\ Adj\ NP_i\ ]]_j}]]$ [N≫Num≫Adj≫Dem]
d. $[_{DP}\ [_{XP}\ [_{YP}\ NP_i\ Adj\ \sout{NP_i}\ ]_j\ Num\ \sout{[_{YP}\ NP_i\ Adj\ NP_i\ ]_j}]_k\ [_{WP}\ Dem\ \sout{[_{XP}\ [_{YP}\ NP_i\ Adj\ NP_i\ ]_j\ Num\ [_{YP}\ NP_i\ Adj\ NP_i\ ]_j]_k}]]$ [N≫Adj≫Num≫Dem]

While Cinque's 2005 study concerns the basic order of Dem, Num, Adj, N in a broader crosslinguistic setting, Carstens (2008, 2017) directly addresses the DP-internal order flexibility issue in Bantu. Following Abels & Neeleman (2012), Carstens (2017) argues that, while Dem>Num>Adj>N is a universal structural hierarchy, it is essentially not a universal linear order, even underlyingly: The hierarchy can map into linear order in different directions at each level; in particular, demonstratives, numerals, and adjectives are all adjuncts that independently can either be right- or left-adjoined to the structure. She further proposes that the noun systematically undergoes N-to-D movement (this part is inherited by the current scrambling account). Take only one order for example. In Carstens's system, the order N≫Dem≫Adj≫Num (1d) is derived from base generation of all the modifiers and N-to-D movement, as in (35); importantly, in this case, while the demonstrative and the adjective are left-adjoined, the numeral is right-adjoined to NumP:

(35)



While the order in (35) is derived without positing modifier movement within DP, it is not the case that modifiers cannot move in Carstens's system. Recall from Section 4 that pronominal possessives *tend* to be adjacent to the fronted noun (36b), in contrast to lexical possessives, which linearly more often follow other modifiers (36a). For Carstens, both types of possessives are base generated in SpecnP, but pronominal possessives further move to SpecNumP, as represented in (37) (irrelevant details are dropped; see Section 4 for further discussion): [19]

[19] Recall also that there seems to be a cross-speaker variation in Chichewa, regarding whether this linear-order difference between pronominal and lexical possessives is a robust one or just a tendency; see Section 4 for discussion. Note that Carstens's system is designed not only for Chichewa, but for Bantu in general, where this variation is more widely attested. For example, Carstens (2020:78–79) reports some optionality regarding the position of (both types of)

(36) a. zi-péwá zi-táatu zá=táyamíika
8-hats 8-three 8ASSOC=Tayamika
'three hats of Tayamika's'
b. zi-péwá za=thú zi-táatu
8-hats 8ASSOC=our 8-three
'three hats of ours'

(37) [$_{DP}$ *zipéwa*$_i$ [$_{NumP}$ *záthu*$_j$ [$_{NumP}$ *zitátu* [$_{nP}$ ~~*záthu*~~$_j$ ~~*zipéwa*~~$_i$]]]]
hats our three our hats

Hence, the similarities and differences among the three approaches can be summarized as follows:

(38)	Fixed modifier hierarchy	Fixed left-to-right mapping from hierarchy	N-to-D head movement	Operations needed
Cinque 2005	✓	✓	✗	Leftward movement of (a phrase containing) the NP
Carstens 2008, 2017	✓	✗	✓	Leftward movement of pronominal possessives
The scrambling analysis	✓	✓	✓	Leftward scrambling

Now, all approaches converge on the view that the merge order of nominal modifiers follows a fixed hierarchy, possibly a universal one (see (22)), a position that is further confirmed by the two datasets discussed in Sections 2&3 of the present paper. Thus, the extreme order flexibility of the Chichewa DP requires an independent explanation: Either the linear order simply does not reflect the underlying hierarchy in a transparent way (e.g., Carstens's view), or the hierarchy is somehow shifted before the structure is linearized (as in Cinque 2005 and in the scrambling account).

As the two alternative approaches do not directly discuss the two particular patterns reported in this paper, it is not entirely clear how the patterns would be precisely treated under the alternatives, without further assumptions to be made. For example, consider how Carstens's base-generation approach would fit in with the hybrid concord facts discussed in Section 3. First, as long as the merge order of modifiers is kept fixed (assumed by all three approaches), it seems that the principle in (27) (which is responsible for the concord asymmetry) may be captured. However, recall that the hybrid concord pattern was illustrated with possessives, whose order alternation under Carstens's approach is captured by leftward movement as in (37), much as in the scrambling account, which generalizes the fronting process to all types of modifiers. Recall further that the scrambling account states explicitly that the scrambled possessive does not Agree with the head it merges with (so scrambling does not alter the morphology of the possessive, which has already been established in an earlier cycle), while Carstens (2008, 2017) does not discuss the essence of the fronting of the possessive in (37). For Carstens's analysis to hold for the Chichewa hybrid concord pattern, one possible solution could be to posit that possessive fronting as in (37) is non-feature-driven (i.e., a case of scrambling), but that would partially trivialize the differences between the two approaches.

Hence, a meaningful evaluation of the three approaches may depend on how one independently evaluates the two assumptions in (38) that the approaches do not all share, namely (i) an invariant mapping from hierarchy to left-to-right linear order, and (ii) the existence of N-to-D head movement. If both assumptions are accepted (as we have done so far), then in (1) only the order in (1a) (i.e., N≫Dem≫Num≫Adj) may reflect three base-generated modifiers. This inevitably means that the other orders in (1) must involve movement of the modifiers (along with N-to-D movement, which derives N-initiality), which then leads to the DP-internal scrambling account spelled out in the previous sections. However, if any one of the two assumptions is denied, the door to an alternative analysis may open.

At any rate, whether the two assumptions are correct remains a matter of debate in the literature, and an in-depth justification of any of them lies outside the scope of the current paper (see however below for an argument that necessitates N-to-D movement). However, in the following, I show that the two alternatives

possessives in Swahili and Shona. That is, from a cross-Bantu perspective, lexical possessives *may* move, and pronominal possessives *may* stay in situ.

are in fact either empirically inadequate, or are unnecessarily more complicated than the scrambling account, at least for capturing the constituent order facts in the Chichewa DP.

Consider first Cinque 2005. One immediate problem is that it does not actually derive all the six orders in (1). For example, N≫Dem≫Adj≫Num, though a possible order in Chichewa (as in (1d)), is excluded in the system. Cinque (2005) claims that the order is attested in very few languages and suggests that it may be spurious: The order may involve reduced relative clauses, not genuine adjectives. However, in Chichewa, genuine adjectives can freely occur in this order.[20] To derive this order, the NP needs to undergo successive pied-piping movement around Adj, then NP-Adj around Num, after which the NP alone raises across Dem. Notice that these operations involve movement out of moved elements, which is why Cinque views it highly marked and wants to exclude it entirely.

However, the N≫Dem≫Adj≫Num order (1d) is in fact quite often used in Chichewa (it is one of my consultants' most frequent first reactions in elicitation). True, this order has not been explicitly stated as a primary order of Chichewa nominals in the literature, likely due to the fact that there are too many alternatives (the description often simply includes a statement that the noun goes first in a nominal, sometimes with a note that the modifier order is flexible, without giving one order as primary; cf. Mchombo 2004:24, Downing & Mtenje 2017:27). In fact, it appears that many other Bantu languages allow N≫Dem≫Adj≫Num as well. Among the three languages mentioned by Cinque (2005) that allow it, two of them are Bantoid: Noni (Bantoid; Hyman 1981:31) and Nkore-Kiga (Taylor 1985:55). In addition, Shona, another Bantu language, also freely permits it (Carstens 2017). It would not be surprising if more Bantu languages are found to be like this (that is, the rarity of this order may be overestimated).[21] While this is unexpected for Cinque 2005, it is directly captured by the scrambling account proposed in this paper, which might be extendable to other Bantu languages with N-initial order in DP, though I leave this comparative issue to future research.

Furthermore, there is another order in (1) that has not been directly discussed so far, namely N≫Num≫Dem≫Adj in (1b), which clearly cannot be derived under Cinque's (2005) approach (the order is reported to be unattested in Cinque 2005). The presence of this order thus strongly indicates that Chichewa is problematic for Cinque 2005.

The inability to derive all the possible orders in (1) is not the only drawback that Cinque 2005 is faced with. As pointed out by Carstens (2017), a descriptive generalization that is missed under this approach is the strict N-initiality of these orders. As partially exemplified by (34), the noun linearly preceding all modifiers in (1) has very different derivational histories, which as a result makes N-initiality a totally accidental fact in Cinque's system. It is also not clear how to exclude some unattested orders in Bantu such as Num≫N≫Adj≫Dem, because NP can stay right above Adj without moving further (as in (34b), where NP stays in YP), and nothing prevents the new Num-NP-Adj constituent (i.e., XP in (34)) from moving across Dem (cf. (34c), (34d)). At any rate, to capture the Chichewa facts in Cinque's system one would need a separate statement that, for whatever reason, the noun must ultimately go first in DP. Such a statement does not seem to be derivable from anything else in Cinque's (2005) system, so I take it to be undesirable. By contrast, positing that the noun undergoes head movement to D directly captures the N-initiality generalization in Chichewa, as well as in Bantu in general.

Now consider the base-generation approach. It needs to be pointed out that it also cannot actually capture all of the six possibilities in (1), at least without additional order-affecting operations to be allowed. Specifically, N≫Num≫Dem≫Adj (1b) and N≫Adj≫Dem≫Num (1e) cannot be derived via base generation; there is simply no way of realizing the demonstrative linearly between the numeral and the adjective, if the former c-commands the latter two. Carstens (2010) is fully aware of this issue (the two orders are also possible in Shona), but notes that for her Shona speaker, there seems to be a very slight pause following the demonstrative under these orders. She thus suggests that the two orders may involve more complex structures, i.e., something like [N XP Dem … [*pro* small]/[*pro* three]] (there is a *pro* following the demonstrative; translation would roughly be like 'these three spoons, the small ones').

[20] Many Chichewa adjectives are indeed reduced relatives, but *zázíkúlu* 'big' in (1) is a genuine adjective; note that the two types of adjectives, both attested in the language (Mchombo 2004, Downing & Mtenje 2017), do not show differences regarding constituent order depending on this categorial difference.

[21] More recently, Dryer (2018) records 13 languages that have the N≫Dem≫Adj≫Num order, seven among which are Niger-Congo (Bantu is the largest branch of the Niger-Congo language family).

Regarding Chichewa, recall, from Section 4, that nominal modifiers (except for pronominal possessives) are systematically followed by a phonological phrase break (32); my consultants report that one can in fact add a pause freely after any kind of nominal modifiers. There is then no prosodic support for the existence of a post-demonstrative *pro* in Chichewa. At any rate, the presence of N≫Num≫Dem≫Adj (1b) and N≫Adj≫Dem≫Num (1e) at least weakens the base-generation account, under which extra assumptions are needed to capture these orders.

Such complexity is not necessary for the scrambling account. In addition, as discussed in Section 4 and also summarized in (38), to account for the order difference between pronominal possessives and lexical possessives, some sort of modifier movement is independently needed even under the base-generation account, complicating the picture further. For us, what is needed is just scrambling in general, which applies to all kinds of modifiers, with possible phonological restrictions. In other words, to keep Carstens's (2017) solution to the constituent order puzzle in Chichewa, one must posit some sort of leftward movement of the modifier *in addition to* the assumption that modifiers may be either left- or right-adjoined (along with N-to-D movement, which is needed anyway), but we have seen that leftward movement alone as in the scrambling account can derive the order flexibility of the modifiers.

In sum, it was shown that the scrambling analysis captures N-initiality and DP-internal order flexibility in Chichewa in a more straightforward way, so it is preferred over the two other approaches discussed in this section. I leave it to further research how the three approaches in (38) would be compared from a more general perspective, though one should keep in mind that there is no a priori reason that N-initiality and/or DP-internal order flexibility should cross-linguistically be considered homogeneous phenomena.

6. Concluding remarks

In this paper I have argued for a scrambling approach to the constituent order flexibility within the DP in Chichewa. While being independent from information structure considerations, all logically possible orders of Dem, Num, and Adj, following N, are in principle allowed in the Chichewa DP. To account for the facts, three components are needed. The first is N-to-D movement, which derives strict N-initiality. The second is the hypothesis that the well-established Dem>Num>Adj structural hierarchy universally maps left-to-right into linear order. The third, which is also the major point of the paper, is DP-internal scrambling of nominal modifiers. Based on the assumption that modifiers establish a featural Spec-head relation with the local functional heads they merge with in their base-generated positions and that the landing site of scrambling does not involve a local Spec-head relation, a number of data points regarding N'-ellipsis and hybrid concord in Chichewa have been accounted for.

Two alternative explanations were examined, namely Cinque's (2005) phrasal movement account and Carstens's (2008, 2017) base-generation account. It was argued that the scrambling approach fits the Chichewa facts better, for different empirical and conceptual reasons. Thus, the paper offered a new way of deriving DP-internal order flexibility, one that may be considered in future research on other languages.

Although the current paper has not aimed to explore in any detail the theoretical essence of scrambling, it may be interesting to note that although scrambling is widely attested cross-linguistically and is well discussed, most discussions generally concern constituent order at the clausal level (see, e.g., references in fn.4). The current study reported a case of scrambling at the nominal level, and as such can in fact be taken as a confirmation that scrambling exists also within DP; this should be considered a desirable result, since theoretically, nothing prevents scrambling from occurring DP-internally.

References

Abels, Klaus, and Ad Neeleman. 2012. Linear asymmetries and the LCA. *Syntax* 15.1:25–74. https://doi.org/10.1111/j.1467-9612.2011.00163.x

Adger, David, Patrick Kanampiu, Klaus Abels, Alexander Martin, and Jennifer Culbertson. 2021. Hierarchy and predication in the Kîîtharaka nominal phrase. Paper presented at the *2021 Annual Meeting of the Linguistics Association of Great Britain and Northern Ireland (LAGB)*, online.

Aelbrecht, Lobke. 2010. *The syntactic licensing of ellipsis*. Amsterdam: John Benjamins.

Baker, Mark C. 2003. 'Verbal adjectives' as adjectives without phi-features. In Yukio Otsu (ed.), *The Proceedings of the Fourth Tokyo Conference on Psycholinguistics*, 1–22, Hituzi Syobo, Tokyo.

Béjar, Susana. 2003. Phi-syntax: A theory of agreement. PhD dissertation, University of Toronto.

Béjar, Susana & Milan Řezáč. 2009. Cyclic Agree. *Linguistic Inquiry* 40.1:35–73.

Blümel, Andreas. 2017. Exocentric root declaratives: Evidence from V2. In Leah Bauke and Andre-as Blümel (eds.), *Labels and roots*, 263–290. Berlin: De Gruyter Mouton.

Bošković, Željko. 1997. Coordination, object shift, and V-movement. *Linguistic Inquiry* 28.2:357–365.
Bošković, Željko. 2004a. Topicalization, focalization, lexical insertion, and scrambling. *Linguistic Inquiry* 35.4:613–638.
Bošković, Željko. 2004b. Be careful where you float your quantifiers. *Natural Language and Linguistic Theory* 22:681–742.
Bošković, Željko. 2007. On the locality and motivation of Move and Agree: An even more minimal theory. *Linguistic Inquiry* 38:589–644.
Bošković, Željko. 2011a. On unvalued uninterpretable features. In Suzi Lima, Kevin Mullin & Brian Smith (eds.), *North East Linguistic Society 39*, 109–120. Amherst: GLSA.
Bošković, Željko. 2011b. Last Resort with Move and Agree in derivations and representations. In Cedric Boeckx (ed.), *The Oxford handbook of linguistic minimalism*, 327–353. Oxford: Oxford University Press.
Bošković, Željko. 2024. On wh and subject positions, the EPP, and contextuality of syntax. *The Linguistic Review* 41.1:7–58. https://doi.org/10.1515/tlr-2024-2002
Cardinaletti, Anna, and Michal Starke. 1999. The typology of structural deficiency: A case study of the three classes of pronouns. In Henk van Riemsdijk (ed.), *Clitics in the languages of Europe*, 145–233. New York: Mouton de Gruyter. https://doi.org/10.1017/s0022226703282293.
Carstens, Vicki. 1991. The morphology and syntax of determiner phrases in Kiswahili. PhD dissertation, University of California, Los Angeles.
Carstens, Vicki. 1997. Empty nouns in Bantu locatives. *The Linguistic Review* 14.4:361–410.
Carstens, Vicki. 2001. Multiple agreement and case deletion: Against φ-(in)completeness. *Syntax* 4.3:147–163.
Carstens, Vicki. 2008. DP in Bantu and Romance. In Cécile de Cat & Katherine Demuth (eds.), *The Bantu-Romance connection: A comparative investigation of verbal agreement, DPs, and information structure*, 131–165. Amsterdam: Benjamins.
Carstens, Vicki. 2010. Head movement in Bantu DPs. Paper presented at the *41st annual meeting of the North East Linguistic Society*, University of Pennsylvania, 22–24 October.
Carstens, Vicki. 2011. Hyperactivity and hyperagreement in Bantu. *Lingua* 121:721–741.
Carstens, Vicki. 2016. Delayed valuation: A reanalysis of goal features, 'upwards' complementizer agreement, and the mechanics of case. *Syntax* 19.1:1–42.
Carstens, Vicki. 2017. Noun-to-determiner movement. In Martin Everaert & Henk van Riemsdijk (eds.), *The Wiley Blackwell companion to syntax* 2nd edition, vol. V, 2758–2783. Somerset, NJ: John Wiley and Sons. https://doi.org/10.1002/9781118358733.wbsyncom120
Carstens, Vicki. 2020. Concord and labeling. In Peter W. Smith, Johannes Mursell & Katharina Hartmann (eds.), *Agree to agree: Agreement in the minimalist programme*, 71–116. Berlin: Language Science Press. https://doi.org/10.5281/zenodo.3541747
Carstens, Vicki, and Michael Diercks. 2013. Agreeing how? Implications for theories of agreement and locality. *Linguistic Inquiry* 44:179–237.
Chomsky, Noam. 1993. A minimalist program for linguistic theory. In Kenneth Hale & Samuel Jay Keyser (eds.), *The view from Building 20: Essays in linguistics in honor of Sylvain Bromberger*, 1–52. Cambridge, MA: MIT Press.
Chomsky, Noam. 1995a. Bare Phrase Structure. In Héctor Campos & Paula Kempchinsky (eds.), *Evolution and revolution in linguistic theory*, 51–109. Washington, D.C.: Georgetown University Press.
Chomsky, Noam. 1995b. *The minimalist program*. Cambridge, MA: MIT Press.
Chomsky, Noam. 2000. Minimalist inquiries: The framework. In Roger Martin, David Michaels & Juan Uriagereka (eds.), *Step by step: Essays on minimalist syntax in honor of Howard Lasnik*, 89–156. Cambridge, Mass: MIT Press.
Chomsky, Noam. 2001. Derivation by phase. In Michael Kenstowicz (ed.), *Ken Hale: A life in language*, 1–52. Cambridge, Mass: MIT Press.
Chomsky, Noam. 2013. Problems of projection. *Lingua* 130:33–49.
Chomsky, Noam. 2015. Problems of projection: Extensions. In Elisa Di Domenico, Cornelia Hamann & Simona Matteini (eds.), *Structures, strategies and beyond: Studies in honour of Adriana Belletti*, 3–16, Amsterdam: John Benjamins.
Cinque, Guglielmo. 2005. Deriving Greenberg's Universal 20 and its exceptions. *Linguistic Inquiry* 36.3:315–332.
Cinque, Guglielmo. 2010. *The syntax of adjectives: A comparative study*. Cambridge, MA: MIT Press.
Clem, Emily. 2023. Cyclic expansion in Agree: Maximal projections as probes. *Linguistic Inquiry* 54.1:39–78.
Corbett, Greville. 1979. The agreement hierarchy. *Journal of Linguistics* 15.2:203–224. https://doi.org/10.1017/S0022226700016352
Corbett, Greville. 1991. *Gender*. Cambridge: Cambridge University Press.
Danon, Gabi. 2011. Agreement and DP-internal feature distribution. *Syntax* 14:297–317.

Downing, Laura J., and Al Mtenje. 2011. Un-WRAP-ing prosodic phrasing in Chichewa, *Lingua* 121.13:1965–86.
Downing, Laura J., and Al Mtenje. 2017. *The phonology of Chichewa*. Oxford: Oxford University Press.
Dryer, Matthew S. 2018. On the order of demonstrative, numeral, adjective, and noun. *Language* 94.4:798–833.
Ferrari, Franca. 2005. A syntactic analysis of the nominal systems of Italian and Luganda: How nouns can be formed in the syntax. PhD dissertation, New York University.
Frampton, John, and Sam Gutmann. 2000. Agreement is feature sharing, Manuscript, Northeastern University.
Franks, Steven, and Tracy Holloway King. 2000. *A handbook of Slavic clitics*. New York: Oxford University Press.
Fuchs, Zuzanna, and Jenneke van der Wal. 2022. The locus of parametric variation in Bantu gender and nominal derivation. *Linguistic Variation* 22.2:268–324.
Fukui, Naoki. 1993. Parameters and optionality. *Linguistic Inquiry* 24.3:399–420.
Gong, Zhiyu Mia. 2022. Issues in the syntax of movement: Cross-clausal dependencies, reconstruction, and movement typology. PhD dissertation, Cornell University.
Haegeman, Liliane. 1996. Verb second, the split CP and null subjects in early Dutch finite clauses. *GenGenP* 4.2:133–175.
Hawkins, John A. 1990. A parsing theory of word order universals. *Linguistic Inquiry* 21.2:223–261.
Hawkins, John A. 1994. *A performance theory of order and constituency*. Cambridge: Cambridge University Press.
Hawkins, John A. 2004. *Efficiency and complexity in grammars*. Oxford: Oxford University Press.
Heinat, Fredrik. 2008. *Probes, pronouns and binding in the Minimalist Program*. VDM Verlag.
de Hoop, Helen. 2003. Scrambling in Dutch: Optionality and optimality. In Simin Karimi (ed.), *Word order and scrambling*, 201–216. Malden, MA: Blackwell.
Hyman, Larry M. 1981. *Noni grammatical structure*. Southern California Occasional Papers in Linguistics 9. Los Angeles: University of Southern California.
Imamura, Satoshi. 2017. Information structure in Japanese: scrambling, topicalization and passives. PhD dissertation, University of Oxford.
Inkelas, Sharon. 1989. Prosodic constituency in the lexicon. PhD dissertation, Stanford University, Stanford, Calif.
Jackendoff, Ray. 1971. Gapping and related rules. *Linguistic Inquiry* 2.1:21–35.
Johnson, Kyle. 1991. Object positions. *Natural Language & Linguistic Theory* 9:577–636.
Jovović, Ivana. 2024.; Condition B and other conditions on pronominal licensing in Serbo-Croatian. *Linguistic Inquiry* 55.2: 402–421. https://doi.org/10.1162/ling_a_00475
Jouitteau, Mélanie. 2008. The Brythonic reconciliation. In Jeroen van Craenenbroeck (ed.), *Linguistic variation yearbook 2007*, 163–200. Amsterdam: John Benjamins.
Kanerva, Jonni M. 1990. *Focus and phrasing in Chichewa phonology*. New York: Garland.
Kayne, Richard S. 1994. *The antisymmetry of syntax*. Cambridge, MA: MIT Press.
Kim, Rhang-Hye-Yun. 2003. Scrambling and minimalist program. *Studies in Generative Grammar* 13:3–19.
Koizumi, Masatoshi. 1995. Phrase structure in minimalist syntax. PhD dissertation, MIT.
Kramer, Ruth. 2015. *The morphosyntax of gender*. Oxford: Oxford University Press.
Landau, Idan. 2007. EPP extensions. *Linguistic Inquiry*, 38.3: 485–523.
Landau, Idan. 2016. DP-internal semantic agreement: A configurational analysis. *Natural Language & Linguistic Theory* 34:975–1020.
Lasnik, Howard. 1999a. *Minimalist analysis*. Oxford: Blackwell.
Lasnik, Howard. 1999b. On feature strength: Three minimalist approaches to overt movement. *Linguistic Inquiry* 30.2:197–217.
Lasnik, Howard. 2001. A note on the EPP. *Linguistic Inquiry* 32.2:356–362.
Lee, Seunghun J., and Kristina Riedel. 2023. Recursivity and focus in the prosody of Xitsonga DPs. *Languages* 8.2:150. https://doi.org/10.3390/languages8020150
Lobeck, Anne. 1990. Functional heads as proper governors, In *North East Linguistics Society* 20, Issue 2, Article 6. Available at: https://scholarworks.umass.edu/nels/vol20/iss2/6
Lobeck, Anne. 1995. *Ellipsis: Functional heads, licensing, and identification*. Oxford: Oxford Univer-sity Press.
Mahajan, Anoop Kumar. 1990. The A/A-bar distinction and movement theory. PhD dissertation, MIT.
Mchombo, Sam. 2004. *The syntax of Chichewa*. Cambridge: Cambridge University Press.
Merchant, Jason. 2001. *The syntax of silence. Sluicing, islands and the theory of ellipsis*. Oxford: OUP.
Pesetsky, David, and Esther Torrego. 2007. The syntax of valuation and the interpretability of features. In Simin Karimi, Vida Samiian & Wendy Wilkins (eds.), *Phrasal and clausal architecture: Syntactic derivation and interpretation*, 262–294. Amsterdam: John Benjamins.
Řezáč, Milan. 2003. The fine structure of cyclic Agree. *Syntax* 6:156–182.
Roberts, Ian. 2004. The C-system in Brythonic Celtic languages, V2, and the EPP. In Luigi Rizzi (ed.), *The cartography of syntactic structures, vol. 2: The structure of CP and IP*, 297–327. Oxford: Oxford University Press.

Roberts, Ian, and Anna Roussou. 2002. The Extended Projection Principle as a condition on the tense dependency. In Peter Svenonius (ed.), *Subjects, expletives, and the EPP*, 125–155. New York: Oxford University Press.
Saito, Mamoru. 1992. Long distance scrambling in Japanese. *Journal of East Asian Linguistics* 1:69–118.
Saito, Mamoru. 2003. A derivational approach to the interpretation of scrambling chains. *Lingua* 113:481–518.
Saito, Mamoru. 2004. Japanese scrambling in a comparative perspective. In David Adger, Cécile de Cat & George Tsoulas (eds.), *Peripheries: Syntactic edges and their effects*, 143–163. Dordrecht: Kluwer Academic Publishers.
Saito, Mamoru. 2016. (A) Case for labeling: Labeling in languages without φ-feature agreement. *The Linguistic Review* 33:129–175.
Saito, Mamoru, and Naoki Fukui. 1998. Order in phrase structure and movement. *Linguistic Inquiry* 29.3:439–474.
Saito, Mamoru, and Keiko Murasugi. 1990. N'-deletion in Japanese: A preliminary study. In Hajime Hoji (ed.), *Japanese/Korean Linguistics* 1, 285–301. Stanford: CSLI Publications.
Smith, Peter W. 2015. Feature mismatches: Consequences for syntax, morphology and semantics. PhD dissertation, University of Connecticut.
Smith, Peter W. 2017. Possible and impossible agreement mismatches. Manuscript, Goethe University Frankfurt.
Tada, Hiroaki. 1993. A/A-bar partition in derivation. PhD dissertation, MIT.
Taylor, Charles. 1985. *Nkore-Kiga*. London: Croom Helm.
Villa-García, Julio. 2012. The Spanish complementizer system: Consequences for the syntax of dislocations and subjects, locality of movement, and clausal structure. PhD dissertation, UConn.
Villa-García, Julio. 2015. *The syntax of multiple-que sentences in Spanish*. Amsterdam/Philadelphia: John Benjamins.