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Prosodic asymmetries in nominal vs. verbal phrases in Bantu

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Investigations into phonological differences between nouns and verbs focus almost exclusively on the lexical (word) level, showing that underlying contrasts are more numerous and stable ("faithful") on nouns (Smith 1998, 1999). This raises the question of whether these (or other) alleged differences in word level phonology generalize to the nominal vs. verbal phrase. The Bantu family provides an ideal testing ground for such an investigation. Based on Bantu, I show that nouns are more likely to undergo modification at the phrase level than verbs, thereby obeying less "faithfulness" to the input than verbs. Nominal phrases also show more distinct outputs and complex idiosyncracies than their verbal counterparts. After establishing that there are distinct asymmetric properties in the phrasal phonology of nominal vs. verbal constituents in Bantu, I raise the question of what causes these asymmetries and whether they are general or pertain only to Bantu and other African languages.

Key words:
Bantu, phrasal phonology, faithfulness, nominal phrase, verbal phrase, tone, vowel length

1.   Introduction

As can be seen from my title, the goal of this paper is to discuss prosodic differences between nominal and verbal phrases, with particular reference to Bantu.[1] My starting point is recent work on phonological properties that are specific to one vs. another word class, e.g. Kelly (1992), Berg (2000), Smith (2001, 2011), Albright (2007), and Plank and Kabak (2016), among others. Most of this work has focused on apparent differences between nouns and verbs. In a number of publications, Smith (1999, 2001, 2011) makes three key proposals:

First, nouns show more contrasts than verbs: "... nouns license phonological contrasts that words of other lexical categories do not" (Smith 1999: 528). In this context, Smith cites Japanese accent: In Tokyo Japanese, verbs have predictable accent vs. unpredictable accent or no accent on nouns (but see Kubozono 2008: 169). In Fukuoka Japanese, verbs have penultimate accent vs. nouns which contrast multiple accent positions or can be accentless (Smith 1999: 519).

Second, nouns preserve these contrasts more than verbs, i.e. outputs are more "faithful" to their inputs in nouns than in verbs. Smith's (2001: 63) example comes from Sinhala which resolves vowel hiatus differently in nouns vs. verbs. In nouns, a root vowel + suffix vowel hiatus is resolved by inserting a glide between the two vowels, thereby preserving both vowels. On the other hand, the final root vowel of a verb instead deletes before a suffix vowel.

Finally, nouns and verbs are subject to different distributional restrictions and rules, the best known example of the latter being English stress placement.

Thus, according to Smith, nouns are "more privileged" (more contrasts, fewer restrictions), "stronger" (resistant to phonological processes), and "freer": "Verbs are more likely to require inflectional morphemes than nouns, so it might be said that nouns are closer to canonical free forms while verbs are closer to canonical bound forms" (Smith 2001: 66). Such preferential properties lead Smith (ibid) to conclude that nouns are "psychologically prominent": "...there are findings from psycholinguistic studies suggesting that nouns are prominent. Nouns seem to be processed differently from verbs in a way that suggests differences in semantic or lexical organization."

An important observation is that such comparisons focus almost exclusively on the lexical root or word levels, and do not address how the phonology of nouns and verbs compare at the phrase level. The general question I raise here is whether the above alleged differences in word level noun vs. verb phonology generalize to the phrase level phonology? We know for example that both noun modifiers and verb complements trigger phonological processes, especially prosodic reduction of the head noun or verb (see surveys in Harry and Hyman 2014: 680-1, Rolle 2018). The specific questions I will address in what follows are: (i) Are there more contrasts on nouns in nominal prosodic phrases than on verbs in verbal prosodic phrases? (ii) Are nouns more resistant to phrasal phonological processes than verbs (i.e. more "faithful" to the word-level outputs)? (iii) Are nominal and verbal prosodic phrases subject to the same vs. different rules/constraints?

Well known for its extensive phrase-level phonology, the Bantu family of ca. 500 languages provides an ideal testing ground for addressing such questions. These languages are also particularly relevant in this context, as it has been claimed that Bantu nouns support greater contrasts than verbs: "In various Bantu languages, nouns have a greater number of contrastive tonal melodies than verbs have (e.g. Shona: Myers 1997)" (Smith 2001: 63). In what follows I will survey cases of recurrent differences in nominal vs. verbal prosodic phrase phonology in Bantu languages (§2) and discuss the relevance of these findings for prosodic domain theory (§3). I will then come back to the word-level to consider whether Bantu nouns do contrast more tone patterns than verbs (§4). From the languages surveyed, the conclusion in §5 is that verbs show more prosodic activity at the word level, while nouns show more activity at the phrase level, thereby raising the question of whether this is specific to certain languages and or to Language in general.

2.   Nominal vs. verbal prosodic phrases in Kalabari and Bantu

While Bantu is my main focus, I will start, however, by citing some facts from a non-Bantu language to establish my first point, that nouns show greater variability than verbs at the phrase level. Kalabari, an Ijo language of Nigeria, which contrasts five tone patterns on both nouns and verbs (Harry and Hyman 2014: 668):

(1)		nouns		verbs	
H-H	námá	'meat'	ɛ́rí	'see'
L-L	pùlò	'oil'	sɛ̀lɛ̀	'change'
H-L	bélè	'light'	kámà	'increase'
L-H	èkpé	'he-goat'	ɗɔ̀kí	'discover'
H-ꜜH	wáꜜrí	'house'	kóꜜkó	'keep'

The above tones are however often modified at the phrase level. By a rare process of phrasal construction tone, different modifiers within the noun phrase assign four different tonal melodies to the head noun (which occurs NP-finally). Thus, the H-H noun /námá/ 'animal, meat' shows four different patterns in the following contexts (Harry and Hyman 2014: 651):

(2) construction   phrasal tones
     Possessive noun + N   HL   tòɓɔ̀ námà   'the child's animal'
     Possessive pronoun + N   HLH (→ H-ꜜH)   ìnà náꜜmá   'their animal'
     Determiner + N   LH   tɔ̀ nàmá   'which animal?'
     Quantifier + N   L   jà nàmà   'some meat'

As a result of these tonal overrides which affect all five tone patterns, H-H nouns will appear with five different tone patterns, while other nouns will appear with four:

(3) citation tones   construction tones   # melodies
     H-H   H-L   H-ꜜH   L-H   L-L   5
     L-L   H-L   H-ꜜH   L-H   L-L   4
     H-L   H-L   H-ꜜH   L-H   L-L   4
     L-H   H-L   H-ꜜH   L-H   L-L   4
     H-ꜜH   H-L   H-ꜜH   L-H   L-L   4

In Kalabari the verb also occurs finally in its phrase. In this case, whenever a direct object is present before the verb, rather than assigning a tonal melody, the verb loses all of its tones and the last tone of the object noun spreads onto the verb, as seen in (4).[2]

(4) object ends L: ɛ́rí → èrì 'see'   (also → sèlè, kàmà, dɔ̀kì, kòkò)

     pùlò   'oil'   ò pùlò èrì téꜜɛ́   'he has seen oil'
     bélè   'light' ò bélè èrì téꜜɛ́   'he has seen light'

     object ends H: sèlè → sélɛ́ 'choose'   (also → kámá, dɔ́kí, ɛ́rí, kókó)

     námá   'meat'   ò námá sélɛ́ téꜜɛ́   'he has chosen meat'
     wáꜜrí 'house' ò wáꜜrí sélɛ́ téꜜɛ́   'he has chosen the house'
     gàrí   'garri' ò gàrí sélɛ́ téꜜɛ́   'he has chosen garri' (= a food)

As a result, L-L and H-H verbs will appear with two different tone patterns, while H-L, L-H and H-H verbs will appear with three:

(5) citation tones   object tone overrides   # melodies
     H-H   H-H   L-L   2
     L-L   H-H   L-L   2
     H-L   H-H   L-L   3
     L-H   H-H   L-L   3
     H-ꜜH   H-H   L-L   3

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2 In the last example, a later rule changes *sélɛ́* to *ꜜsélɛ́* after a L-H word such as *gàrí* (Harry and Hyman 2014: 664).

From the above we can establish only ONE common property between the processes affecting nominal and verbal phrases in Kalabari, namely, that the five contrasting lexical tone patterns merge on both nouns and verbs. However, there are FOUR different properties between the derived nominal vs. verbal phrase phonology: (i) The maximum number of tone melodies is greater on nouns (N = 4, V = 2); (ii) Multiple triggers affect the noun target, while the object is the only trigger affecting the verb target; (iii) The different triggers assign GRAMMATICAL tonal melodies to the noun vs. PHONOLOGICAL tone spreading on the verb; (iv) Within the nominal prosodic phrase there is a possibility of "entrapped" targeted words between the modifier trigger and the head N (vs. the local object-verb effect). As seen in (6), which involve the two H-H nouns *féní* 'bird' and *námá* 'meat', the HL, HLH, LH and L melodies map over whole noun phrases:[3]

(6) a. tòɓɔ̀ 'child' assigns the HL melody to the rest of the phrase

    tòɓɔ̀ + féní + námá → tòɓɔ̀ fèní nàmà   'the child's bird's
     ∨ | | | | ∨ | ∨   meat'
     L   H-H   H-H   L   H̲   L̲

    b. ì 'my' assigns the HLH melody to the rest of the phrase

    ì + féní + námá → ì fèní nàmá   'my bird's meat'
    | | | | | | | | |
    L   H-H   H-H   L   H̲   L̲ H̲

In short, more is going on in the nominal vs. verbal prosodic phrase.

Now let us see how this applies to Bantu, focusing first on the Rutara subgroup of languages spoken to the West and Southeast of Lake Victoria in Tanzania and Uganda. These languages are particularly helpful in investigating faithfulness effects since they have two opposite phrasal rules affecting head nouns and verbs: H Tone Deletion (HTD) and H Tone Insertion (HTI). The two rules are exemplified on Runyankore nouns in (7).[4]

(7) a. H tone deletion affecting a noun with a /H/ tone

    ebikópo 'cups'   vs. ebikopo biháango 'big cups'
       H   Ø̲   H

    b. H tone insertion affecting a toneless noun (no /H/)

    ebitabo 'books'   vs. ebitabó biruungi 'good books'
                                    H̲

As seen in (8), verbs may also undergo HTD and HTI, e.g. in the remote past tense:

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[3] The dashed association lines indicate a later tone spreading process.

[4] While these rules have been previously discussed, especially—although with some differences—by Poletto (1998), unless otherwise noted, all data is from my work with consultants Daphine Namara (DN) and Gloria Tumushabe (GT), whom I heartily thank. Where possible, I also have verified my results with the examples cited in Kaji (2004), which provides an extraordinary vocabulary with tonal indications on nouns followed by different modifiers.

(8)   a.   H tone deletion affecting a verb with a /H/ tone

        ba-ka-túm-a   vs.   ba-ka-tum-a Kakúru

             H   Ø   H

        'they sent'   'they sent Kakuru'

      b.   H tone insertion affecting a toneless verb (no /H/)

        ba-ka-shab-a   vs.   ba-ka-shab-á Muhweezi

                                          H

        'they begged'   'they begged Muhweezi'

As a first approximation of the two rules, HTD deletes H tones from a head noun or verb when it is followed by a constituent in the same clause that itself has a H tone (see, however, (10b) below). HTI inserts a H tone on the final vowel of a head noun or verb when both it and the constituent which follows are toneless. Although not further exemplified here, the following constituent must occur in the same clause (it cannot be a right-dislocation, for example).

      In order to understand these rules, I conducted a comparative study of HTD and HTI in the Rutara languages. We are lucky to have a number of available studies, including data from four different sources on Runyankore, which I label Runyankore 1-4 in Table 1. In the first column I have identified each of the Rutara languages by their Guthrie (1971) reference number as updated by Maho (2009). The headers in the first line of the table stand for the various potential triggers of HTD: possessive pronouns (POSS), adjectives (ADJ), genitive nouns (GEN), numerals (NUM), and demonstratives (DEM). The column labeled VERB indicates whether the verb is also targeted for HTD. As seen, the exact configurations that condition HTD vary considerably across Rutara languages and dialects.[5]

Language	Guthrie	POSS	ADJ	GEN	NUM	DEM	VERB	Source
Runyankore1	JE13	+	+	-	-	-	-	Poletto (1998)
Runyankore2	JE13	+	+	+	-	-	+	Kaji (2004)
Runyankore3	JE13	+	+	+	-	-	+	Personal notes (speaker DN)
Runyankore4	JE13	+	+	+	±	-	+	Personal notes (speaker GT)
Rukiga	JE14	+	+	+	?	?	+	Kisseberth & Ndabasara (1993)
Runyambo	JE21	+	-	+	-	-	+	Hubbard (1992)
Kinyambo	JE21	+	+	+	+	?	+	Bickmore (1989)
Ruhaya	JE22	+	+	+	-	-	+	Hyman & Byarushengo (1984)
Ruzinza	JE23	+	-	-	-	-	+	Odden (2000)

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5 In Table 1, I distinguish four different sources of data from Runyankore. Besides possible dialect, age, prestige, and other demographic facts that may be at play, there is much confusion over what is Runyankore vs. Rukiga, as well as dialect mixture. In his review of this paper, Shigeki Kaji suggests that there may be elements of Rukiga in Runyankore1, since Kaji's speakers have very limited HTD. However, Kisseberth and Ndabasara (1993) show extensive HTD in the Rukiga noun phrase, and van der Wal and Asiimwe (2020) document HTD on the verb in Rukiga. On the other hand, Shigeki Kaji reports in his review of this paper that his speakers of Rukiga do not have HTD (nor do they have HTI which is reported for Rukiga by Kisseberth and Ndabarasara (1993), as indicated in Table 2 below. A systematic dialect study of these tonal differences would definitely be worthwhile.

Kikerewe	JE24	-	-	-	-	-	(-)	Odden (2008)
Kijita	JE25	-	?	-	-	-	-	Downing (1996)
Chiruri	JE253	-	?	?	?	-	?	Massamba (1982)

Table 1. High Tone Deletion in the Different Rutara Languages

The generalizations that can be drawn from Table 1 are as follows: (i) Possessive pronouns always trigger HTD; (ii) Adjectives and genitive nouns usually trigger HTD (with only one exception each); (iii) Numerals vary in triggering HTD [6]; (iv) Demonstratives never trigger HTD. This thus produces the hierarchy in (9).

(9)   POSS >> { ADJ, GEN } >> NUM >> DEM

As Table 1 also indicates, the verb is almost always targeted for HTD. The major exceptions occur in the languages located to the East of Lake Victoria at the bottom of the table, where HTD does not apply at all: Kikerewe, Kijita, Chiruri. Poletto (1998) surprisingly reports that HTD does not affect verbs in Runyankore1, definitely an exception among the contiguous Rutara languages to the West and Northwest of Lake Victoria.

By comparison, H Tone Insertion (HTI) shows less variation, and applies more generally across Rutara languages and dialects. This is seen in Table 2, where blanks under DEM indicate that demonstratives do not trigger HTI because none are underlyingly toneless.[7]

Language	Guthrie	POSS	GEN	ADJ	NUM	DEM	VERB	Source
Runyankore1	JE13	+	+	+	+		+	Poletto (1998)
Runyankore2	JE13	+	+	+	+		?	Kaji (2004)
Runyankore3	JE13	+	+	+	±		+	Personal notes (speaker DN)
Runyankore4	JE13	+	+	+	+		+	Personal notes (speaker GT)
Rukiga	JE14	+	?	+	?		+	Kisseberth & Ndabarasa (1993)
Runyambo	JE21	?	+	+	?		+	Hubbard (1992)
Kinyambo	JE21	+	?	+	?		+	Bickmore (1989)
Ruhaya	JE22	+	+	?	-		+	Hyman & Byarushengo (1984)
Ruzinza	JE23	+	+	+	?		+	Odden (2000)
Kikerewe	JE24	+	+	+	+	(-)	-	Odden (2008)
Kijita	JE25	+	+	+	+	+	-	Downing (1996)
Chiruri	JE253	+	?	+	?	+	?	Massamba (1982)

Table 2. High Tone Insertion in the Different Rutara Languages

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[6] Under NUM Runyankore2 and Runyankore3 show HTD only before numerals 1-5, which agree in noun class, but not before other numerals which do not agree with the noun. ± indicates optionality. Question marks indicate that I do not have the relevant information.

[7] While the surface forms of some demonstratives may be toneless, e.g. Runyankore class 8 *e-bi* 'these', the *e-* prefix, like all augment vowels, has an underlying /H/ which is deleted after pause. Thus, /é-bi-kópo é-bi/ 'these cups' is pronounced [è-bì-kóp' é̠è-bì], with vowel coalescence and conversion of a penultimate long vowel H to a HL falling tone.

As seen, almost all of the cells are filled positively, indicating that HTI will generally apply to a toneless noun or verb that is followed by a toneless constituent to its right.[8] Even the Eastern Rutara languages at the bottom of the table show HTI applying to nouns—although not to verbs. This brings us to the one clear generalization that emerges from a comparison of the HTD and HTI contexts in the two tables: If HTD or HTI affects the verb, it will also affect the noun. The reverse is not true: In Runyankore1 HTD applies to nouns, but not to verbs. In Kikerewe and Kijita, HTI applies to nouns, but not to verbs. Historically, I would suggest that both must have first applied to nouns and only later to verbs.[9]

Coming back to the noun-verb asymmetries, the above generalization would seem to imply that at the phrase level nouns are less faithful to tonal inputs than verbs. However, there are two important differences concerning HTD that contribute to verbs being less faithful. First, whereas the noun trigger is restricted to a subset of nominal dependants (e.g. POSS, GEN, ADJ), the verb doesn't care what follows: an object, locative, prepositional phrase, adverb etc. [10] As Hubbard (1992: 7) states the same fact for Runyambo, "... the verbal head is less selective about its reduction environment than the noun head—anything within the clause will do." Hence, returning to Runyankore, we find that the H tone of *ba-ka-zín-a* 'they danced' (remote past) is deleted before the prepositional phrase in *ba-ka-zin-a na Kakúru* 'they danced with Kakuru'.

There is a second difference between nominal vs. verbal phrases: Whereas the nominal modifier must have a H tone, HTD will apply to the verb even when the following constituent is toneless. Thus, although we see the H tone of *ebikópo* 'cups' deleting before the H tone adjective *biháango* 'big' in (10a), repeated from (7a), HTD does not apply before the toneless adjective *bi-ꜜruungi* 'good' in (10b).

(10) a.　ebikopo　biháango　　'big cups'
　　　　　　　Ø

　　b.　ebikópo　biruungi　　'good cups'
　　　　　　H

Now compare the realization of the isolation verb form *bá-á-túm-a* 'they have sent' (recent past) in the two corresponding phonological contexts in (11).

(11) a.　ba-a-tum-a　kakúru　　　'they have sent Kakuru'
　　　　　Ø Ø　　　　H

　　b.　ba-a-tum-á　muhweezi　'they have sent Muhwezi'
　　　　　Ø Ø　　　↑
　　　　　　　　　　H

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[8] I purposely avoid the more complex question of how HTI applies to multiple potential targets (e.g. verb + noun + modifier) or how far away a H tone can be and still block HTI. Such questions discussed in part in some of the cited studies are the topic of a separate paper in preparation.

[9] Shigeki Kaji has informed me (pers.comm.) that his speakers of Rukiga do not have HTD in the nominal phrase but do have some HTD in the verbal phrase, making this an exception. He also points out that Southern Rukiga has commonalities with Kinyarwanda, with whom they are in contact. I am looking forward to studying these materials once they become available (Kaji, in preparation.)

[10] This is different from Kalabari, where only the DO affects the following verb.

In (11a) the two H tones of the verb transparently undergo HTD before *kakúru* which has a /H/ tone. Differing from the noun in (10b), the verb also undergoes HTD before toneless *muhweezi*. However, since this creates a sequence of toneless verb + toneless complement, HTI applies, as shown. In other words, HTD feeds HTI. As a result, verbal H tones will be deleted in phonological contexts where nominal H tones are preserved. Thus, while HTD on nouns is restricted by both the grammatical and tonal properties of the trigger, verbs will undergo HTD before any complement and any tone.

While the verb doesn't care about the nature of the complement that follows, its ability to undergo HTD is affected by the inflectional morphology, which is spelled out on the verb itself. In both Runyankore and other Rutara languages, certain semantically "marked" or "inherently focused" inflectional features block HTD. Table 3 summarizes the marked-unmarked distinctions in Ruhaya (Hyman and Byarushengo 1984: 71, Hyman and Watters 1984: 260).

Marked (verb doesn't undergo HTD)		Unmarked (verb undergoes HTD)	
Polarity:	all negative verb forms; affirmative forms of:	Polarity:	affirmative forms of:
Aspects:	progressive	Aspects:	present habitual
	perfect		past habitual
	inceptive ('ever')	Tenses:	today past (P1)
	persistive ('still')		yesterday past (P2)
Moods:	subjunctive		remote past (P3)
	imperative		general future (F1)
Also:	infinitive		remote future (F2)

Table 3. Inflectional Features Blocking vs. Allowing HTD in Ruhaya

As seen, only verbs with semantically "unmarked" polarity, aspect, and tense undergo HTD, specifically those affirmative verb forms that do not involve one of the marked aspects or moods. While to my knowledge no one has worked on this in depth, occasional syntactic solutions have been proposed to account for the different triggers of HTD within the nominal phrase as well as the marked/unmarked inflectional targets within the verbal phrase: The former have been related to the N' vs. N" structure of the NP, e.g. [[N Poss]$_{N'}$ Num]$_{N''}$ (Hyman and Byarushengo 1984: 73). Marked inflectional effects on verb targets have been suggested to depend on whether the verb raises to a higher node, e.g. to Neg, thereby making the verb non-adjacent and no longer c-commanded by the post-verbal constituent, as schematized in (12).

(12)
Affirmative [+HTD] Negative [-HTD]
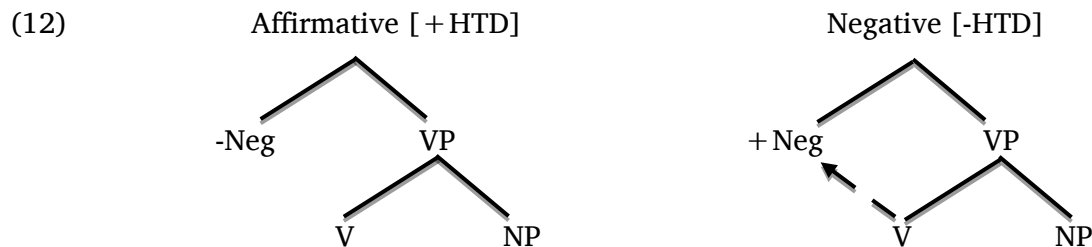
Just as the HTD triggers vary in the nominal phrase (Table 1), the marked inflectional categories vary in the verbal phrase in Rutara (cf. Odden 2000: 51-52 for Zinza; Odden 2008 for Kikerewe) as

well as the parallel distinction in H tone plateauing in closely related Luganda (Hyman, Katamba and Walusimbi 1987: 92-94).

To summarize, we have observed the following two differences in nominal vs. verbal phrase phonology: (i) From Rutara, we have seen variable phrasing. Which triggers affect nouns (POSS > ADJ, GEN > NUM > DEM) varies more than in verbs (where triggers can be anything in the same clause). (ii) From Kalabari, we have seen that noun modifiers trigger variable effects: the assigned tonal melodies differ by modifier (vs. a single effect of the direct object on verbs). Both of these observations are confirmed in other Bantu languages. For example, as displayed in Table 4, the Makonde dialects spoken quite far away in Southeast Tanzania and Mozambique differ in whether a noun + modifer forms one vs. two phonological phrases (φ) (Rolle and Hyman 2019):[11]

Source	Dialect	POSS	DEM	ADJ	NUM
Leach (2010)	Plateau Shimakonde	1φ	1~2φ	2φ	2φ
Devos (2004)	Makwe	1φ	1~2φ	2φ	2φ
Manus (2003, 2018)	Zanzibar Simakonde	1~2φ	1φ	2φ	2φ
Kraal (2005)	Chinnima	1φ	1φ	2φ	2φ
Liphola (2001)	Coastal Shimakonde	1φ	1φ	1φ	2φ
Odden (1990a,b)	Chimaraba	1φ	1φ	1φ	1φ
Odden (1990c)	Chimahuta	1φ	1φ	1φ	1φ

Table 4. Phonological Phrasing in the Makonde Noun Phrase

Rather than by tone, phonological phrases are marked by penultimate lengthening in Makonde. As seen in Table 4, possessive pronouns and demonstratives almost always phrase with the head noun, while adjectives and numerals vary. In Zanzibar Simakonde (Manus 2003, 2018), adjectives, genitives, and numerals phrase separately, each marked by penultimate lengthening, as in (13):

(13) NOUN   ADJ   GEN   NUM
      (vi-lo<u>ô</u>ngo)_φ   (ví-kúme<u>ê</u>ne)_φ   (vy-á n<u>a</u>áswe)_φ   (vi-v<u>i</u>íli)_φ
      CL8-pot   CL8-big   CL8-GEN white   CL8-two

      'two big white pots'

However, as seen in (14), demonstratives (which usually come last in the nominal phrase) have rather unique effects:

(14) NOUN   ADJ   GEN   NUM   DEM
      (ví-l<u>ó</u>ngó   ví-kúm<u>é</u>né   vy-á n<u>á</u>swé   ví-v<u>í</u>lí   aviilá)_φ
      CL8-pot   CL8-big   CL8-GEN white   CL8-two   CL8.DEM

      'those two big white pots'

---

11 The cells marked 1~2φ in the possessive pronoun and demonstrative columns vary according to subtle differences in function or structure. See the indicated references for more information.

The phrase in (14) differs syntactically from (13) only by the addition of *aviilá* 'those', which exemplifies the following three requirements of demonstratives, which (i) must phrase with the head noun, (ii) "entrap" any intervening modifiers, and (iii) assign an all H tone pattern to all of the preceding constituents.[12]

Why the Rutara, Makonde and other Bantu languages and dialects should show such variation in nominal phrasing is not clear. As far as we know, such prosodic phrasing differences do not correspond to structural or word order differences in the noun phrase. Among Dryer's (2018) analysis of the basic noun phrase word order in 576 languages are the following 14 (Narrow) Bantu languages in Table 5 which show the demonstrative in seven different positions with respect to the noun and other modifiers:[13]

1	N̲-Adj-Num-Dem	:	Chichewa, Maore Comorian, Nduumo
2	N̲-Num-Dem-Adj	:	Haya
3	N̲-Dem-Adj-Num	:	Swahili, Nkore-Kiga, Runyankore
4	N̲-Dem-Num-Adj	:	Nyakyusa
5	Adj-N̲-Dem-Num	:	Koko (Kako)
6	Dem-N̲-Adj-Num	:	Kifuliiru, Akoose
7	Dem-N̲-Num-Adj	:	Digo, Bembe, Bakweri

Table 5. Basic Noun Phrase Order in Fourteen Bantu Languages

Since Simakonde demonstratives generally come last in the noun phrase, but cohere the most to the head noun, it is likely that different motivations conflict in determining the properties of demonstratives (cf. §5).

While the Makonde dialects confirms the variability that was seen in Rutara, other Bantu languages show that different modifiers can have different prosodic effects (as in Kalabari). Although I will only mention this in passing, Table 6 summarizes three different effects found in the nominal phrase in Luganda (Hyman and Katamba 1990-1, 2010; Hyman 2019):

Luganda	POSS	GEN	DEM	ADJ	NUM	
(i) H Tone Plateauing (HTP)	+	+	-	-	-	(cf. HTD)
(ii) Floating H assigned to noun	+	+	+	-	-	
(iii) H Tone Anticipation (HTA)	+	+	+	+	-	(cf. HTI)

Table 6. Tonal Effects by Noun Modifier in Luganda

As indicated, H tone plateauing occurs in analogous contexts to HTD in Rutara, hence limited to possessive pronouns and genitives vs. demonstratives, adjectives, and numerals. Corresponding to

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[12] The fact that demonstratives form such a tight bond with the head noun makes them quite different from Rutara where demonstratives are the least likely to trigger HTD. Note also that the entrapment of the adjective 'big', genitive 'of white' and numeral 'two' represents an extension of word level "prosodic smothering" (Bennett, Harizanov and Henderson 2018) to the phrase level (Rolle and Hyman 2019).

[13] While the Runyankore entry is based on Morris and Kirwan (1972), the Nkore-Kiga designation refers to Taylor (1985) who treats Runyankore and Rukiga together in one work. (Neither marks tone, unfortunately.)

Rutara HTI, H tone anticipation occurs more widely, triggered by all modifiers except numerals. In addition, L tone possessive pronouns and genitive nouns, as well as demonstratives, assign a H to the preceding noun (or other modifier). Given Makonde and Luganda (and other languages that could be cited), I think it's safe to say that Bantu nouns are (i) more vulnerable and (ii) subject to a wider range of prosodic modifications at the phrase level than verbs. Let us now briefly consider what this difference might mean for prosodic domain theory.

3.   Prosodic domain theory and/or direct syntax?

In this section I will suggest that reference to the specific type of nominal modifier (possessive, demonstrative etc.) does not necessarily mean that prosodic domains are irrelevant. Two defaults I have always assumed, following Selkirk (1980, 1984, 1986), Nespor and Vogel (1986) etc. are: (i) If a head noun or verb interacts phonologically with a specific adjacent element, the two must form a prosodic domain. (ii) Nominal and verbal prosodic domains are constructed according to the same principles, whether following an "end-based" algorithm (Selkirk 1986, Chen 1987) or "matching theory" (Selkirk 2011).

In constructing prosodic domains I have also assumed the following syntactic parallelism for Bantu (if not beyond): Object NPs bear the same relationship to the verb as a Genitive NP bears to the Noun. Since both are NP complements, the following should form equivalent phonological phrases in head-initial Bantu languages: [V NP]φ   =   [N NP]φ. Parallel phrasing works for H Tone Insertion (HTI), which (as we saw in Table 2) applies quite generally within nominal and verbal phonological phrases (cf. Poletto 1998). However, more specific grammatical information is needed for H Tone Deletion (HTD). Recall from Table 1 that in the dialect of Runyankore described by Poletto (1998), HTD only affects the noun before a possessive pronoun or adjective—and doesn't apply at all to the verb. The question is how to account for this and other differences displayed across Rutara in Table 1?

Prosodic domain theorists (e.g. Selkirk, Nespor and Vogel etc.) also recognize that there are certain phenomena that require reference to specific syntactic categories or configurations. This is the case with High Tone Deletion, which varies so much within the Rutara languages and dialects. In fact, HTD has all of the trappings of what Hayes (1990) terms "precompiled lexical phonology". HTD looks like lexical phonology in at least four ways:

First, like morphological constructions, HTD has to distinguish somewhat unpredictably between different nominal modifiers, while HTI applies more generally within a canonically identifiable phonological phrase (φ). As Hayes (1990: 107) puts it: "Only precompiled rules can treat parallel X' categories differently."

Second, we saw in (11b) that the more "lexical-like" HTD feeds HTI, i.e. applies "earlier" in a derivational sense:

(15)   'they have sent'   'they have sent Muhwezi'

        bá-á-túm-a   →   ba-a-tum-a Muhweezi
          H H   (by HTD)   Ø̲ Ø̲

                   →   ba-a-tum-á Muhweezi
             (by HTI)   H
                              ↑
                              Ø

This is exactly what would be expected if HTD occurs in the lexical phonology, with the output subcategorized for a specific syntactic frame, as Hayes defines precompiled phrasal phonology.

Third, there are systematic exceptions to HTD, which is generally expected only of lexical rules. A special class of (class 1a) nouns which lack a noun class prefix do not undergo HTD. Thus, compare:

(16) a. Class 1:   omw-áana   vs.   omw-aana wa Kakúru
                            H   Ø   H
                       'child'   'child of Kakuru'

      b, Class 1a: karáani   vs.   karááni wa Kakúru
                           H   H̲   H
                       'clerk'   'clerk of Kakuru'

Whereas *omwáana* 'child' undergoes HTD in (16a), the borrowed noun *karáani* 'clerk' does not. Other nouns found to show the same resistance to HTD are either borrowings (cf. *kááwa* 'coffee', *cóoka* 'chalk', *gáragi* 'garage') or various names of animals and plants, e.g. *karóori* 'fish-eagle'.[14] On the other hand, HTI has no lexical exceptions.

Finally, HTD resembles the lexical tonology more than HTI does. As exemplified in (17), the Rutara languages typically delete any H tones that precede an inflectional H tone suffix.

(17) a. Infinitive: o-ku-káraang-a   'to roast'
                                H

      b. Remote past: tu-ka-káraang-a   'we roasted'
                                H

      c. Hortative: tu-karaang-é ...   'let's roast'
                                Ø   H

In (17a) we see that the root *-káraang-* 'roast' has an underlying H tone. In (17b) this H surfaces since the remote past tense does not assign a suffixal H. In the hortative form in (17c), however, where a morphological H tone is assigned to the final vowel *-e*, the H of the root must delete.[15]

So how should these facts be interpreted? I'm not saying that phrasal HTD is a "lexical rule", just that it has more of the properties of lexical phonology than we would expect of a phrase-level prosodic domain. One thing that is clear is that both the grammar-specific HTD and the more general HTI rule apply only within what would be expected to be a prosodic phrase. Neither applies, for instance, to a subject noun followed by the verb or to the verb followed by a right-dislocation. My informal proposal is that the same prosodic phrases be constructed for both HTD and HTI, but that grammatical conditions should be added for HTD (as OT-based approaches would allow). In this way we can account for the modifier-specific nature of HTD in the nominal phrase—

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14 On the other hand, class 1a kinship terms such as *mu-nyáanya* 'opposite sex sibling' which have a prefix, but lack an initial augment vowel (**o-mu-nyáanya*) generally do undergo HTD before a possessor: *munyaanya wa Kakúru* 'Kakuru's sister'. A more elaborate paper is being planned to do with these and other details.

15 The three dots indicate that this is how the verb is realized in medial position, e.g. *tu-karaang-é háti* 'let's roast now'. Since a H is not allowed to surface in utterance-final position, it must be retracted to the penult, hence: *tu-karáang-e* 'let's roast'.

vs. its greater predictability within the verbal phrase. At the same time we can satisfy ourselves as to why the phonology seems much more "lexical-like" in the nominal phrase than in the verbal phrase, which brings me back to noun vs. verb differences at the lexical (word) level.

4.   Nouns vs. verbs again

Recall the claim that nouns distinguish more tonal contrasts than verbs in Bantu languages (and Japanese). It is important to note that this refers to noun and verb ROOTS, and not to words. It's not clear if verbal WORDS host fewer contrasts. Consider, for example in Table 7, the identical eight noun and verb tones in Iau, a Lakes Plain language of Papúa, Indonesia, where S = superhigh, H = high, M = mid, and L = low tone (Bateman 1990: 35-36):

Tone	Nouns		Verbs		Inflectional meaning
H	bé	'father-in-law'	bá	'came'	totality of action punctual
M	bē	'fire'	bā	'has come'	resultative durative
HS	bé̋	'snake'	bá̋	'might come'	totality of action incompletive
LM	bĕ	'path'	bă	'came to get'	resultative punctual
HL	bê	'thorn'	bâ	'came to end point'	telic punctual
HM	bê	'flower'	bâ	'still not at endpoint'	telic incompletive
ML	bè	'small eel'	bà	'come (process)'	totality of action durative
HLM	bê̄	'tree fern'	bâ̄	'sticking, attached to'	telic durative

Table 7. Word-level Tonal Contrasts in Iau

As seen, there is an eight-way lexical contrast on nouns. Verb roots are, however, underlyingly toneless, e.g. /ba/ 'come', but contrast the same eight tones which realize the inflectional distinctions in the rightmost column. Thus, although tone is lexical on nouns, but grammatical on verbs, there is no difference in the number of contrasts distinguished on each.

A similar situation exists in many Bantu languages, where there is even the potential for verbs to support more tonal contrasts than nouns. Consider Lulamogi, a Bantu language dialectal with Lugwere and closely related to Luganda, Lusoga, and the Rutara languages. As seen in the infinitive forms in Table 8, although Proto-Bantu had a *H vs. *L contrast on verb roots, preserved in Luganda and (although inverted) in Lusoga, Lulamogi has merged the root tones:[16]

Proto-Bantu		Luganda	Lusoga	Lulamogi	
*H	*-bómb-	o-ku-búumb-a	o-kú-bùumb-á	ó-ku-buumb-á	'to mould'
	*-kám-	o-ku-kám-a	o-kú-kàm-á	ó-ku-kam-á	'to milk'
	*-léet-	o-ku-léet-a	o-kú-lèet-á	ó-ku-leet-á	'to bring'
*L	*-bàl-	o-ku-bal-a	o-kú-bál-á	ó-ku-bal-á	'to count'
	*-càb-	o-ku-sab-a	o-kú-sáb-á	ó-ku-sal-á	'to ask, beg'
	*-mìd-	o-ku-mir-a	o-kú-mír-á	ó-ku-mil-á	'to swallow'

Table 8. Infinitive Verb Tones in Luganda, Lusoga, and Lulamogi

While verb roots do not contrast tones, noun stems do.[17] Table 9 shows that the four tonal possibilities on CVCV noun roots of Proto-Bantu have merged into a two-way contrast:

Proto-Bantu		Lulamogi		stem:
*H-H	*kálí	ó-mu-kalí	'woman'	L-H
*H-L	*kónò	ó-mu-konó	'arm'	L-H
*L-H	*-tìkí	é-kí-síki	'stump, log'	H-L
*L-L	*-gènì	ó-mú-géni	'guest'	H-L

Table 9. Tonal Contrasts on CVCV Noun Stems in Lulamogi

If we extend to CVCVCV stems, four tone patterns contrast, although the second group is found almost exclusively in borrowings:

(i)	(H-L-) L-H-H	é-ki-siríkí	'cockroach'	
	(H-H-) H-H-L	é-kí-tálázo	'rust'	
(ii)	(H-H-) H-L-H	ó-mú-sómesá	'teacher' (<Swahili)	
	(H-) L-H-L	é-bakúli	'bowl' (<Swahili)	

Table 10. Tonal Contrasts on CVCVCV Noun Stems in Lulamogi

While noun stems do contrast more tone patterns than verb roots (see note 18 for terminology), verb STEMS actually contrast eight different tone patterns, encoded with the full color spectrum (red-orange-yellow-green-blue-purple-brown-black) in Table 11.

	MCA	SRA	ORA	MCN	SRN	ORN
Habitual	(L)H*L	HL*H	HL*H	(L)H*	(L)H*	(L)H*
Present	LH*	LH*	LH*	LH*	LH*	LH*
Perfect	(L)H*L	(L)H*L	(L)H*L	LH*	(L)H*	LH*
Past1	(L)H*	(L)H*	(L)H*	(L)H*	(L)H*	LH*
Past2	LH*L	LH*L	LH*L	(L)H*L	(L)H*L	LH*L
Past3	L*H	L*H	L*H	L*H	L*H	L*H
Future1	L*H	L*H	L*H	L*H	L*H	L*H
Future2	LH*	LH*	LH*	LH*	LH*	LH*
Future3	LH*	LH*	LH*	LH*	LH*	LH*
Imperative	L*H			H*		
Infinitive	LH*			(L)H*		

Table. 11 Tonal Contrasts on Verb Stems in Lulamogi

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[17] It is customary in Bantu to distinguish between monomorphemic roots vs. stems which consist of a root plus possible suffixes. While verb roots must have a suffix in canonical Bantu, most noun stems are monomorphemic and hence will be referred to as stems rather than roots.

As seen, these tone patterns depend both on the tense, aspect, and mood distinctions in the first column, as well as the clause type and polarity.[18] Even noun stems longer than CVCVCV cannot fully express the eight-way verb stem tonal contrasts above. Similar stories could be told about other Bantu languages, whether they have lost the tonal contrast on verb roots or not.

5. Conclusion

From the above survey we can draw the following conclusions concerning the prosodic properties of the two word classes. First, compared to nouns, verb roots tend to show fewer prosodic contrasts, ultimately losing such contrasts entirely.[19] However, we have also seen that verbal WORDS and nominal PHRASES have much more going on than nominal words and verbal phrases. The question is why. I believe there are two factors at work. The first factor is the tendency for there to be more inflection on verbs than on nouns. Assuming this widely accepted typological view, if verbal inflection is marked by tone, as in Bantu, there will be more tones on verbs. By comparison, there is less nominal inflection in Bantu, mostly the *L noun class prefixes which are often synchronically toneless (Ø), i.e. phonologically inactive in the privative tone systems examined in this study. Crucially, if there are more tones on verbs, tonal competition can produce various sorts of tonal combinations, mergers, and eventual overrides of the lexical tonal contrasts on the verb root, producing the kind of "templatic" tone presented in Table 11 in Lulamogi.

The second factor concerns nominal modification at the phrase level. The multiple types of modifiers on nouns (POSS-ADJ-NUM-DEM) form a close-knit paradigm of individual WORDS, where the often fixed order of these words resembles a morphological template with the modifiers vying for "slots". In fact, the closed class function word modifiers POSS and DEM resemble inflectional categories which often occur adjacent to the noun, becoming enclitics in some Bantu (and other) languages. This is quite different from verbal phrases, clauses, and utterances whose prosodic domains concern the interaction between PHRASES. The main opportunity for phrasal complexity within the noun phrase comes from the potential recursivity of nominal possession (N_1 of N_2 of N_3...), each N capable of its own modifiers (N_1 ADJ of N_2 DEM etc.), which also can contribute to the wide range of variation in the nominal phrase. Among the interesting parameters that affect both the order and prosodic effect of modifiers is the duality of demonstratives (and presumably other determiners). While demonstratives are grammatical morphemes and hence gravitate toward (and potential fuse with) the head noun, they have wide semantic scope over the noun phrase. We saw the conflict in the above examples: The demonstrative never triggers HTD in the Rutara languages (Table 1), while in Makonde demonstratives are required to phrase with the head noun to which they also assign all H tone (Table 4 and example (14)).

The hypothesis presented here is that the above two factors, verbal inflection and nominal modification, together are responsible for the two conclusions we can draw from Bantu: (i) At the word level, verbs show more prosodic variation than nouns; (ii) At the phrase level, nouns show more prosodic variation than verbs. Whether these differences extend beyond Bantu to other languages, if not to Language in general, remains to be seen. It would be good to know how the prosody of nominal and verbal phrases compares in unrelated languages that host as much phrasal phonology as in the Bantu language family.

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[18] The abbreviations in the top row stand for Main Clause Affirmative, Subject Relative Affirmative, Object Relative Affirmative, Main Clause Negative, Subject Relative Negative, and Object Relative Negative. See Hyman (2014).

[19] In his review of this paper José Hualde points out that this holds also for Spanish where noun roots can be stressed on any of the last three syllables, while verb roots are all stressed in the same way. See Hualde (2005: 220-235)

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