



## High Tone Spreading and Phonological Phrases in Bāsàá

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### Abstract

High Tone Spreading (HTS), by which an underlying High tone associated with a mora spreads rightwards and associates with one or several following moras, is a major tonal process in Bāsàá (Cameroon, Bantu A43). We here examine the domain of application of this process and establish that HTS allows us to determine the right edge of Phonological Phrases. We discuss apparent counterevidence to this claim: in the postverbal domain, the distinction between arguments and adjuncts is neutralized, and HTS seems to apply in a purely linear fashion. We offer an account of this pattern using MATCHPHRASEMAX ([11]) and MAX-BIN ([22]). Alternatively, we propose that prosody might here simply provide a window into the unexpected, but not so unusual syntax of this Bantu language.

**Index Terms:** High Tone Spreading, Phonological Phrase, Prosody, Bantu, Syntax-Phonology Interface

### 1. Introduction

A number of excellent studies discuss the tone system of Bāsàá, a Bantu A language spoken in Cameroon ([5, 2, 7], among others).<sup>1</sup> Underlyingly, Bāsàá is similar to many Bantu languages in distinguishing between two tones, H(igh) and L(ow). As will become clear later, Bāsàá also has a number of underlyingly toneless moras (e.g. noun class prefixes). In addition to surface H and L tones, it displays contour tones (falling tones and rising tones) as well as downstepped (ˆ) H tones.

High Tone Spreading (HTS) is described as “the major tone rule in present-day Bāsàá” ([7]).<sup>2</sup> As shown by both [5] and [7], HTS applies within words. Bisyllabic word stems display 4 surface patterns: HH, LH, LL and H-HL. These are illustrated in turn in (1) to (4).

- (1) a. /kwémbé/ → [kwémbé] – ‘box’  
b. /sókól/ → [sóyól] – ‘grandfather’
- (2) a. /hi-nùní/ → [rìnùní] – ‘bird’  
b. /nùká/ → [nùyá] – ‘animal’
- (3) a. /lòlò/ → [lòlò] – ‘duck’  
b. /ma-kàlà/ → [màkàlà] – ‘doughnuts’
- (4) a. /kémbè/ → [kémbê] – ‘goat’  
b. /li-péhèl/ → [lìbèhèl] – ‘comb’

On the word level, HTS also applies from a stem to one or more derivational suffixes, as briefly shown in (5).

- (5) Causative extension

<sup>1</sup>Our own data and judgments refer to the Northern variety of Bāsàá spoken by the third author.

<sup>2</sup>We can only speculate here that the bounded HTS observed in Bāsàá is related to the non-primitive nature of its tonal system.

- a. hól + V̂s → húlús – ‘to make sharpen’
- b. lék + V̂s → lígís – ‘to make warm up’

Bāsàá does however have words displaying a HL pattern. This is illustrated in (6). As shown by [7], words with a HL tone pattern display sequences of vowels or consonants that are indicative of the loss of segments and probable tonal reorganisation; HTS thus sometimes provides “a window into the underlying syllable structure of a form”.

- (6) a. /kóbol-a/ → kóbòla (HTS) → [kóblà] (syncope)  
b. /ságal-a/ → ságála (HTS) → [ságlà] (syncope)

Finally, as noted by [2], HTS also applies within inflected verbs, from the subject agreement marker to the tense marker, whenever the latter is underlyingly toneless. As shown in (7), this is the case with the Past I marker {-n-}: it displays a L tone when following a L-toned subject marker, and a H tone when following a H-toned subject marker (without creating downstep on a following H).

- (7) a. sóyól            à-ń-téhé            6-óyóyé  
1.grandfather 1.AGR-PST1-see 2-children  
‘The grandfather saw the children.’  
b. 6-òr            bá-ń-téhé            6-óyóyé  
2-people 2.AGR-PST1-see 2-children  
‘The people saw the children.’

Let us now turn to the application of HTS above the word level.

### 2. Detectable right edges

In this section, we examine the application of HTS in various syntactic environments. We establish that a H tone is prohibited from spreading across the right edge of a Phonological Phrase ( $\phi$ ). In accordance with the theory of prosodic phonology ([21, 18]),  $\phi$  is understood as the prosodic domain that relates to the maximal projection of lexical categories. In the edge-alignment theory ([21, 22]), Bāsàá seems to pattern like a number of previously discussed Bantu languages like Chi Mwiini ([15]) or Chichewa ([14]), as it is the right edge of syntactic XPs that is detectably aligned with the right edge of  $\phi$ . In optimality-theoretic terms ([19]), HTS here would suggest a high ranking of the mapping constraint in (8) ([22]).

- (8) ALIGN-XP,R: The right edge of each syntactic XP is aligned with the right edge of a p(honological)-phrase.

In the more recent Match theory ([23]), in which the constraint in (9) enforces a mapping of both syntactic edges of a lexical XP onto prosodic edges, the data examined here suggest that the constraint H-SPREAD, which calls for a H tone associated to a syllable to the left to spread onto a syllable to the right

([23]), is outranked by CRISPEDEGERIGHT ( $\phi$ , H) ([12]). The latter constraint prohibits multiple linking of a H tone across a right edge of  $\phi$ .

- (9) MATCHPHRASE: A phrase in syntactic constituent structure must be matched by a corresponding constituent ( $\phi$ ) in prosodic representation.

We will first look at the application of HTS on the phrasal level and progressively move on to its application on the clausal level.

### 2.1. Connective constructions

The connective construction consists of two noun phrases related by a connective that agrees in noun class features with the noun phrase preceding it. It is found in the vast majority of Bantu languages and expresses a variety of relations (e.g. possessive, qualification or classification; see [25] for a comprehensive overview). The syntactic representation provided by [9] for connective constructions is given in (10).

- (10) [ConnP [NP  $\beta\acute{i}$ -kwémbé] [Conn  $\beta\acute{i}$  [NP  $\acute{b}$ - $\acute{s}\acute{o}$ ngé]]]  
 8-boxes 8.CONN 2-children  
 ‘The children’s boxes.’ (/ $\acute{b}$ - $\acute{o}$ ngé/)

As already noted in [5] and [7], HTS only applies between the connective and NP<sub>2</sub>. This is visible in (11), in which the connective is L-toned and thus does not receive a H from NP<sub>1</sub>.

- (11) [ConnP [NP  $\eta$ -gwó] [Conn  $\grave{i}$  [NP  $m$ - $\grave{a}\grave{a}$ ngé]]]  
 9-dog 9.CONN 1-child  
 ‘The child’s dog.’

This pattern is consistent with HTS being blocked by the right edge of a  $\phi$  made up of by NP<sub>1</sub>.

Note that Bàsàá uses conjoined and compound pronouns of the type illustrated in (12) and (13) respectively ([7]), which closely resemble connective constructions.

- (12)  $\mu\acute{e}$   $n\grave{i}$   $\acute{b}\acute{o}$   
 1.PRO and/with 2.PRO  
 ‘He/her and them’

- (13)  $\acute{b}\acute{o}$   $n\grave{a}$   $\acute{b}\acute{o}$   
 2.PRO including 2.PRO  
 ‘Them’

Both the conjunction and the compounding marker bear a L tone, which makes it impossible to test whether HTS would take place between this functional item and the second pronoun. What we can see, however, is that the H tone carried by the first pronoun fails to spread ([7]). The lack of application of HTS is consistent with a syntactic representation along the same lines as the one in (10) and in which the full pronouns of Bàsàá are lexical XPs.

### 2.2. Noun modification

Noun modification is also usually expressed by means of a connective construction ([5, 7]). [9], who discuss Bàsàá adjectives, show that most adjectives are in fact adjectival nouns. Although they analyse the adjectival connective construction as involving a slightly more complex structure than what was shown in (10), the two noun phrases stand in the same syntactic configuration and display the same behaviour when it comes to HTS: the  $\phi$  consisting of the adjectival noun blocks HTS. This is briefly illustrated in (14).

- (14)  $\acute{b}\acute{a}$ - $\acute{l}\acute{a}m$ ) $\phi$   $\acute{b}\acute{a}$   $\acute{b}\acute{s}\acute{o}$ ngé) $\phi$   
 2-beautiful 2.CONN 2-children  
 ‘Beautiful children’

True adjectives display a different syntactic behaviour. They follow the noun they modify and they agree with it in noun class features. A standard assumption is that adjectives are adjoined to the lexical projection hosting the noun they modify ([1]). No explicit syntactic proposal has been made as to the representation of phrases consisting of a noun and a true adjective in Bàsàá. [9] suggest that their syntax is similar to that of many other Bantu languages, “though some of these require the use of a connective between the noun and a following adjective”. The lack of application of HTS, as in (15), is consistent with the idea that the right edge of a lexical phrase blocks this phonological process.

- (15)  $m\grave{i}n$ - $t\acute{o}mb\acute{a}$ ) $\phi$   $m\grave{i}\eta$ - $k\acute{e}\eta\acute{i}$ ) $\phi$   
 4-sheep 4-big  
 ‘big sheep’

### 2.3. Noun-determination

Demonstrative pronouns, which are analysed by [13] as being adjoined to a functional projection dominating the noun, display the same behaviour as postnominal adjectives: no matter whether they precede or follow the noun, they do not participate in HTS. This is shown in (16) and (17).

- (16)  $\acute{i}$   ${}^{\prime}nd\acute{a}p$ ) $\phi$   $\grave{i}$ - $n\acute{i}$ ) $\phi$   
 AUG 9.house 9-DEM  
 ‘This house’ ([16])

- (17)  $m\acute{i}$ ) $\phi$   $m\grave{o}n\acute{i}$ ) $\phi$   
 4.DEM 4.money  
 ‘That money’

On the phrasal level, adjuncts differ from items that have traditionally been analysed as determiners, like wh-expressions and possessives ([DP wh/poss [NP Noun]]). As exemplified in (18) and (19), the latter participate in HTS with the noun they precede, suggesting that they are not separated by a  $\phi$  right edge.

- (18)  $n\acute{o}\acute{x}\acute{e}$   $m$ - $\acute{u}r$ ) $\phi$   
 1.who 1-man  
 ‘Which man’ (/mùr/) ([7])

- (19)  $g\acute{w}$ - $\acute{e}\acute{e}$   $\beta\acute{i}$ - $t\acute{a}mb$ ) $\phi$   
 8-POSS 8-shoes  
 ‘Her shoes’ (/bi-támb/)

### 2.4. SVO sentences

Without going into too much syntactic detail here, the prosodic structure of SVO sentences is consistent with common assumptions concerning the syntactic structure of simple sentences in Bantu languages given in (20).

- (20) [TP [NP mùr] [T  $\grave{a}$ - $\acute{n}$ - $s\grave{e}\beta\acute{e}l$  [VP < $s\grave{e}\beta\acute{e}l$ > [NP  $m$ - $\acute{a}\acute{a}$ ngé]]]]

As can be seen in example (7-a), repeated in (21) for convenience, HTS does not apply between a subject phrase and a verb. This is also true when the subject is in pronominal form.

- (21)  $s\acute{o}\gamma\acute{o}l$ ) $\phi$   $\grave{a}$ - $\grave{n}$ - $t\acute{e}h\acute{e}$   $\acute{b}$ - $\acute{s}\acute{o}$ ngé) $\phi$   
 1.grandfather 1.AGR-PST1-see 2-children  
 ‘The grandfather saw the children.’

- (22)  $\mu\acute{\epsilon})_{\phi}$  à-ń-téhé      ń-ń-ńgǽ)\_{\phi}  
 1.PRO 1.AGR-PST1-see 2-children  
 ‘He/she saw the children.’

The same pattern is observed between a subject and an intransitive verb, showing that, in Bāsāá, a  $\phi$  can consist of a single prosodic word (i.e. there is no strong requirement for phonological phrases to be minimally binary ([10])). This is illustrated in (23-a) as well as in (23-b), with a subject that is undoubtedly not topicalized.

- (23) a. sóyól)\_{\phi}      à-ń-sèβèl)\_{\phi}  
 1-grandfather 1.AGR-PRS-call  
 ‘Grandfather calls.’  
 b. n-ńǽ)\_{\phi} à-ń-sèβèl)\_{\phi}  
 1-who 1.AGR-PRS-call  
 ‘Who calls?’

In contrast, HTS normally applies between a verb and its complement. This is the case between [à-ń-téhé] and [ń-ń-ńgǽ) (/ń-ńgǽ) in (21) and (22). Note that in both examples, the acquisition of a H tone by the first mora of the complement ‘children’ does not create downstep on the following mora. In our view, this is indicative of the fact that the noun class marker is underlyingly toneless. This pattern contrasts with what is observed when the first mora of a complement is underlyingly L. This is shown in (24): the relinking of an underlying L creates a downstep on a following H tone.

- (24) sóyól)\_{\phi}      à-ń-téhé      nú<sup>+</sup>ǵá)\_{\phi}  
 1.grandfather 1.AGR-PST1-see 7.animal  
 ‘The grandfather saw the animal.’ (/nùkǵá)

HTS between the verb and the phrase that immediately follows it has been previously discussed in connection with the tonal phenomenon known as metatony ([16]), although from a different perspective than the one taken here. In their paper on metatony in Abo (Bantu A42), [8] provide a clear introduction to the origin of the term ‘metatony’ as well as to the various phenomena it encompasses. In Bāsāá as well as in Abo, the heading ‘metatony’ refers to a change of tone in the final mora(s) of a verb, depending on whether it is phrase final or not. Let us briefly illustrate this phenomenon with the sentences in (25).

- (25) a. m-ùr)\_{\phi} à-ń-sèβèl)\_{\phi}  
 1-man 1.AGR-PRS-call  
 ‘The man calls.’  
 b. mùr)\_{\phi} à-ń-sèβél      m-áǵǵé)\_{\phi}  
 1-man 1.AGR-PRS-call 1-child  
 ‘The man calls the child’ (/m-ǵǵé)

The verb ‘call’ ends with a L tone when it is final, and a H tone when an item follows it (within the same  $\phi$ ). Importantly for us, this H tone spreads onto the first mora of the object, as was shown above. The data examined so far thus provides evidence for the phrasing (S) $_{\phi}$  (V O) $_{\phi}$ , in which the subject XP constitutes a separate  $\phi$  from the verb and its complement.<sup>3,4</sup>

In sum, what we have seen so far is that on both the phrasal and clausal levels, HTS applies between items that fail to be

<sup>3</sup>A number of verbs, tenses and XPs do not participate in metatony/HTS. Due to lack of space, we cannot address each of them here. We refer the interested reader to [8] and [17] for a detailed overview and for existing proposals as to how to account for these apparent exceptions.

<sup>4</sup>We do not address the issue of recursive prosodic phrasing here. We leave this issue open for future research.

separated by the right edge of a phonological phrase. Let us now turn to well-known facts that constitute (apparent) counterevidence to this claim.

### 3. Detectable right edges?

In this section, we consider data that seem to suggest that, in the postverbal domain, HTS applies in a purely linear fashion, across an expected phonological phrase right edge (under standard syntactic assumptions). We establish that the high ranking of WRAP ((26), [24]), a constraint that militates against the mapping of some phrasal edges, does not predict the phrasing observed in Bāsāá.

- (26) WRAP-XP: For each XP there must be a  $\phi$  that contains the XP.

We show that the constraints MATCHPHRASEMAX (adapted from [11]) and MAX-BIN ([22]), given in (27) and (28) respectively, fare better in capturing the phrasing observed within VP.

- (27) ALIGN/MATCHPHRASEMAX: A syntactic maximal lexical projection not dominated by another lexical projection must be mapped as a  $\phi$ .  
 (28) MAX-BIN:  $\phi$  maximally dominates two words.

#### 3.1. SVAdjunct

Interestingly, HTS applies between a verb and an adjunct that immediately follows it. This is shown in (29), (30) and (31), with a temporal, a manner and a locative adjunct, respectively.

- (29) m-ùr)\_{\phi} à-ń-sèβél      lèn)\_{\phi}  
 1-man 1.AGR-PRS-call today  
 ‘The man calls today.’ (/lèn)  
 (30) m-ùr)\_{\phi} à-ń-sèβél      mbéjèl)\_{\phi}  
 1-man 1.AGR-PRS-call softly  
 ‘The man calls softly’ (/mbéjèl)  
 (31) m-ùr)\_{\phi} à-ń-sèβél      bí<sup>+</sup>sú)\_{\phi} bí      ndáp)\_{\phi}  
 1-man 1.AGR-PRS-call front      CONN 9.house  
 ‘The man calls in front of the house.’ (/bìsú/)

Under the assumption that adverbials adjoin to the verb phrase (or higher, depending on the adverb type), as in (32), this phrasing is unexpected.<sup>5</sup>

- (32) [TP [NP mùr] [T à-ń-sèβél] [VP [VP <sèβél>] [AdvP mbéjèl] ]]]

HTS does not however systematically apply with any phrase following the verb, as illustrated by the case of VP coordination given in (33).

- (33) à-ń-<sup>+</sup>ǵwés)\_{\phi}      nì      bèn)\_{\phi}  
 1.AGR-PRES-like and/with hate  
 ‘He/she likes and hates.’

If we are on the right track, it seems that the right edge of VP which is generally assumed to separate a verb from an adjunct fails to map onto a  $\phi$  right edge. The ranking WRAP-XP >> ALIGN-XP, R fails to account for the phrasing observed in Bāsāá. As indicated in [24], WRAP-XP applies to the VP category, which is only consists of the material dominated by all the segments of VP (in (32), this is only the verb).

<sup>5</sup>A similar phrasing is observed and discussed by [4] in Zulu.

### 3.2. SVO<sub>1</sub>O<sub>2</sub>

The high ranking of WRAP-XP would additionally incorrectly predict that ditransitive verbs phrase together with their two objects, as both complements of the verb are dominated by all the segments of VP. As shown in (34), HTS however does not apply between the two objects of a ditransitive verb.

- (34) sóyól)<sub>φ</sub> à-ñ-tí bóóyǵé)<sub>φ</sub>  
 1.grandfather 1.AGR-PST1-give 2-children  
 mà-kàlà)<sub>φ</sub>  
 6-doughnuts  
 ‘The grandfather gave the children doughnuts.’

Note that the same phrasing is observed when one or both objects are pronominalized, as shown in (35) to (38). Bàsàá belongs to the Bantu languages that have genuine object pronouns rather than object agreement markers.<sup>6</sup>

- (35) sóyól)<sub>φ</sub> à-ñ-tí bó)<sub>φ</sub> mà-kàlà)<sub>φ</sub>  
 1.grandfather 1.AGR-PST1-give 2.PRO 6-doughnuts  
 ‘The grandfather gave them doughnuts.’
- (36) sóyól)<sub>φ</sub> à-ñ-tí mó)<sub>φ</sub> ñ-òòyǵé)<sub>φ</sub>  
 1.grandfather 1.AGR-PST1-give 6.PRO 2-children  
 ‘The grandfather gave them to the children.’
- (37) sóyól)<sub>φ</sub> à-ñ-tí jò)<sub>φ</sub> ñ-òòyǵé)<sub>φ</sub>  
 1.grandfather 1.AGR-PST1-give 9.PRO 2-children  
 ‘The grandfather gave them it (e.g. a house).’ (/jò/)
- (38) sóyól)<sub>φ</sub> à-ñ-tí bó)<sub>φ</sub> jò)<sub>φ</sub>  
 1.grandfather 1.AGR-PST1-give 2.PRO 9.PRO  
 ‘The grandfather gave it to them.’ (/jò/)

Let us here briefly re-examine some data from [6] in the light of the present discussion. The Bàsàá wh-pronouns *nçǵé* (‘who’), *kí* (‘what’), *láá* (‘how’) and *hé* (‘where’), were shown to display a greater syntactic dependence on the verb than personal pronouns such as the ones shown in (35) to (38). The length of their vowel was also shown to vary depending on their position: they display a long vowel when in phrase-final position (and thus in isolation) and a short vowel when in phrase-medial position (the creation of an extra mora in phrase final position might be a compensatory lengthening process related to the loss of a consonant, a phenomenon known to occur in Bàsàá; [7]). Sentences (39) to (41) show that HTS takes place between the complex Verb+wh-pronoun and the following syntactic phrase.

- (39) m-àayǵé à-ñ-sómb kí ñàŋ?  
 1-child 1.AGR-PST1-buy 7.what 1.mother  
 ‘What did the child buy for his mother?’ (/ñàŋ/)
- (40) m-àayǵé à-ñ-kú<sup>h</sup>húl hé kàâr?  
 1-child 1.AGR-PST1-obtain where book  
 ‘Where did the child get the book?’ (/kàâr/)
- (41) m-ùr à-ñ-òòyǵé lá màkàlà?  
 1-man 1.AGR-PRS-make how 6-doughnuts  
 ‘How does the man make doughnuts?’ (/makàlà/)

The above sentences are thus indicative of the following phrasing: (S)<sub>φ</sub> (V-wh XP)<sub>φ</sub>, in which the wh-pronoun is a clitic and forms a prosodic word with the verb.

<sup>6</sup>Bàsàá is an asymmetrical language. In (non-derived) ditransitive constructions, the recipient argument has a closer relationship to the verb than the theme ([7]).

### 3.3. SVOAdjunct

Finally, prosodically speaking, a sequence of a verb and its two complements, as in (42), displays the same behaviour as a sequence of a verb, its complement, and an adjunct.

- (42) mùr)<sub>φ</sub> à-ñ-sèbél m-áayǵé)<sub>φ</sub> lèn)<sub>φ</sub>  
 1-man 1.AGR-PRS-call 1-child today  
 ‘The man calls the child today.’

In sum, what we have seen in this section follows from the ranking MAX-BIN >> MATCHPHRASEMAX, by which the first phrase within a VP (be it a complement or an adjunct) phrases with the verb, forming a binary  $\phi$ , and a following XP phrases separately. Under standard syntactic assumptions, this ranking wrongly predicts that nouns and adjectives, as in (15), phrase together. More research however needs to be done to establish the syntactic structure of these phrases in Bàsàá.

## 4. Discussion & conclusion

We have examined the domain of application of a major tone rule of Bàsàá, High Tone Spreading, and argued that this process allows us to detect the right edge of phonological phrases. The application of HTS within verb phrases speaks against this conclusion and the observed phrasing could not be accounted for with the constraints that have previously been used to account for phonological phrasing in various languages ([24]). The constraints MATCHPHRASEMAX and MAX-BIN however fare better in accounting for the observed phrasing.

It is worth noting that the phrasing observed in the postverbal domain does follow from the ranking ALIGN-XP, R >> WRAP-XP if the phrase that immediately follows the verb is were assumed to always occupy the same (complement-like) position in the syntactic structure (see [4] for a similar proposal). Although we cannot draw any conclusions on the syntax of Bàsàá based on prosodic evidence only, it is worth mentioning that in the context of Bantu languages, this is not at all an extravagant idea. A number of genetically related languages have been shown to grant a special status to the Immediately After the Verb (IAV) position, for instance by locating focused phrases in it (as in Aghem, see [26] or Zulu, see [3]). [6] have shown that there is no dedicated focus position in the postverbal domain in present-day Bàsàá, as phrases under informational focus simply surface in their canonical position (without alteration to the prosodic phrasing described here). The observed prosodic neutralization between complement and adjunct as well as between various types of immediately postverbal adverbs/adverbials (e.g. time, manner, location) might provide a window into the syntactic structure of Bàsàá. Future work on the grammar of this language will allow us to refine the present account and extend our understanding of the interaction between syntax and phonology.

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