

## The prosody of Shingazidja relatives: An update

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### Abstract

Much work has been done in recent years on the prosody of relative clauses in Bantu languages (see among others Downing et al. 2010), and this is also the case for Shingazidja, a Bantu language of the Comoros (Patin 2010). It has been established that restrictive relatives in Shingazidja differ from non-restrictive ones in that the latter, contrary to restrictives, have the relative separated from its head by a prosodic boundary, as in other languages (Cheng and Kula 2006, Cheng and Downing 2007). However, many aspects of the prosody of Shingazidja relatives remain to be established. In particular, the question of whether relatives in this language are aligned with the boundaries of Intonation Phrases remains undetermined, as the H% boundary tone that characterizes these prosodic structures when they do not emerge at the end of an utterance (see O'Connor and Patin 2015) is not always observable in the data (Patin 2017). The descriptive examination of a corpus collected in 2009 indicates that an H% boundary tone does emerge at the right boundary of the relative, but that (i) this tone is associated with the last surface tone and not with the last vowel, and (ii) that it is absent from a restrictive if the restrictive relative is of reduced size, revealing that eurhythmic constraints condition the prosodic structure of these clauses.

**Keywords:** relatives; Shingazidja; Bantu; intonation; prosody-syntax interface; eurhythmic constraints

### 1. Introduction

The prosody of relative clauses in Bantu languages has received particular attention since the mid-2000s, when collaborations between Lisa Cheng and the Bantu scholars Nancy Kula and Laura Downing revealed in this language family a prosodic distinction between restrictive relatives, where the head and the relative phrase together, and non-restrictive relatives, where the relative and the head phrase separately (see Cheng and Kula 2006 for further discussion on Bemba, a language of Zambia, and Cheng and Downing 2007 on Zulu, a language of South Africa). A volume has been devoted to the prosody of relatives in Bantu languages (Downing et al. 2010), and this question has continued to be the subject of several subsequent works (e.g. Downing and Mtenje 2011a, Clemens and Bickmore 2020, among others). Part of the interest is based on the theoretical consequences of this examination: Downing (2013), for instance,

built upon the prosody of relative clauses in Chicheŵa, a Bantu language of Malawi, to advocate for an edge-based approach to the phonology-syntax interface and, with the help of colleagues (Bonet et al. 2019), made use of the prosody of Zulu relative clauses as an argument against D’Alessandro and Scheer’s (2015) Modular PIC model.

Among the Bantu languages whose prosody of relatives has been studied is Shingazidja, a language of the Comoros. Patin (2010) identifies the same prosodic difference between restrictives and non-restrictives as Cheng and Kula (2006) and Cheng and Downing (2007): the head phrases with the relative clause in restrictives, but phrases separately from a non-restrictive (or a cleft). Because the non-restrictives were frequently surrounded by pauses and subject to extraprosodicity, the proposal is that the left and right boundaries of these structures were aligned with Intonation Phrase boundaries (Patin 2010: 205), in contrast with restrictive relatives where no Intonation Phrase boundary separates the relative from the matrix clause.

However, O’Connor and Patin (2015) identified H% as the main clue for non-final Intonation Phrase<sup>1</sup>, rather than extraprosodicity. Building upon this result, it was shown in Patin (2017) that an H% emerges at the end of restrictive relative clauses, but not all of them. No clear explanation for this variation was provided except a short sentence claiming that “the insertion of an Intonation Phrase boundary [...], signaled by an H%, must be linked to the length of the sentence and idiolectal variation” (Patin 2017: 303), without further evidence. The aim of this paper is to clarify this point and to determine if and when restrictive and/or non-restrictive relatives are followed by an Intonation Phrase boundary.

To do so, this paper mainly relies on a corpus collected in 2009 for the ANR-DFG BantuPsyn project, the structure of which is described in BantuPsyn Project Members (2010). This corpus comprises recordings from a single speaker of Shingazidja and, more marginally, data collected since 2006 from different speakers. This data collected at different stages is examined in order to identify the presence of an H% tone at the end of the relatives, which would signal the presence of an Intonation Phrase boundary. The fact that the main corpus was recorded from a single speaker means that a quantitative analysis makes little sense, so this paper focuses on a descriptive analysis.

The paper is structured as follows: section 2 presents the previously known information on the prosody of Shingazidja relatives, and details what remains to be established. The question of the presence of an H% at the end of a relative, and thus of an Intonation Phrase boundary, is detailed in section 3. Section 4 presents the effect of eurhythmic constraints on the prosody of relatives, after which follows a brief conclusion.

## **2. Background: Previous accounts of the prosody of Shingazidja relative clauses**

In this section, discussions in previous works on the prosody of Shingazidja relatives are presented. In the first subsection, after a short reminder of the tone rules that help to identify the limits of Major Phonological Phrases, the left boundary of the relative clause is reviewed, with an emphasis on whether the relative clause and its head phrase together. In section 2.2, an explanation is provided on how the prosody at the right boundary of relatives is intimately linked to the evolution of the earlier analysis of the prosodic cues of Intonation Phrases.

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<sup>1</sup> L% signals the end of a final Intonation Phrase. Utterance-final relatives will not be discussed in this paper.

## 2.1 The prosody of the left boundary of relative clauses

In this section, a partial overview of the phrasing of relatives is displayed as it occurs on their left boundary. For expository reasons, the focus remains on Maximal Phonological Phrases (henceforth Ma- $\phi$ ),<sup>2</sup> postponing the discussion of Intonation Phrases ( $\iota$  in the glosses below) to section 2.2 and onwards.

Tone shift is the main clue for Maximal Phonological Phrases in Shingazidja (see, amongst others, Cassimjee and Kisseberth 1989, 1998; Philippson 2005; Patin 2007, 2017).<sup>3</sup> When a tone is not blocked by the presence of another tone, it shifts unboundedly to its right. In (1), for instance, the tone of the verb *tsinika*<sup>4</sup> ‘I gave’ shifts up to the first syllable of the object *mapésa* ‘money’ through the beneficiary *wánda* ‘persons’. (In (1) and the following examples, an underlined vowel signals a tone-bearing unit at the underlying level.)<sup>5</sup>

- (1) [ (tsi-nika                      wa-ndu                      má-pe'sá) $\phi$  ],  
       1SG.PFV-give                      2-person                      6-money  
       ‘I gave money to people.’

In (1), the shift of the tone leads to the loss of the first lexical tone of the noun *mapésa* ‘money’, due to an OCP constraint that deletes every even-numbered tone in a Ma- $\phi$ .

However, the shift of the tone is blocked by a Ma- $\phi$  boundary. In (2ai), the tone of the subject noun *mwána* ‘child’ cannot shift to the first syllable of the verb (2aai), even if this syllable is available (i.e. is not associated to a tone that may block the landing of the tone of the subject), because the subject and the VP phrase separately in Shingazidja, as in many other Bantu languages. Similarly, a tone cannot shift from or to a left dislocated NP (2b) or to an NP that is preceded by an augment (2c), an “element that precedes the class prefix of nouns” in Bantu (Van de Velde 2019: 247) and which behaves similarly in Shingazidja to definite articles in Romance languages (Patin, Mohamed-Soyir and Kisseberth 2019: 599).

- (2) a. (i) [ (ye=mw-aná) $\phi$     (ha-li                      m'káte) $\phi$  ],  
           AUG<sub>1</sub>=1-child                      1.PFV-eat                      3-bread  
           ‘The child ate some bread.’  
       (ii) \*ye=mwána háli m'káte

<sup>2</sup> O'Connor and Patin (2015) and Patin (2017) provide evidence in favour of a lower level of phrasing – Minimal Phonological Phrases (Mi- $\phi$ ) – in some varieties of the language; this will not be discussed in this paper. The clue for this level is a phrasal accent H\* that emerges when no surface tone is present in a syntactic phrase (not a *maximal* syntactic phrase in the sense of Truckenbrodt 1999). Since the syntactic domains and phonological clues associated to Ma- $\phi$  and Mi- $\phi$  differ (maximal syntactic phrase and tone shift in the former case – see section 2 – and syntactic phrase and H\* in the latter case), these groups differ from situations where the recursions of a prosodic group lead to structures where a maximal phrase dominates a minimal phrase of the same nature, as in Elfner (2015), for instance. See the aforementioned references for further details.

<sup>3</sup> Another clue may well be the length of the (stressed) penult of the phrase (see Rey 1990 for a discussion built upon data from one speaker). However, no controlled experiment with a sufficient number of speakers has been conducted yet to confirm this idea. Moreover, recent investigation reveals that tone, vowel quality, and stress interact in quite a complicated way, with an impact on the length of the final vowels of a prosodic group (Patin 2018).

<sup>4</sup> Words in the body of the text are cited in their isolated form.

<sup>5</sup> Abbreviations: AUG = augment; FUT = future; HYP = hypothetical; NEU = neutral; OM = object marker; PAS = passive; PFV = perfective; PL = plural; REL = relative; SG = singular. Numbers refer to classes.

- b. (i) [ (ze=ŋ-guwó)<sub>ϕ</sub> (ha-zi-'húlu)<sub>ϕ</sub> ],  
 AUG<sub>10</sub>=10-cloth 1.PFV-OM<sub>10</sub>-give  
 ‘The clothes, (s)he gave them.’  
 (ii) \*ze=ŋguwo házihu'lú
- c. (i) [ (ha-wonó)<sub>ϕ</sub> (ye=ma-ga'wá)<sub>ϕ</sub> ],  
 1.PFV-see AUG<sub>6</sub>=6-raven  
 ‘(S)he saw the ravens.’  
 (ii) \*hawono ye=magáwa

Patin (2007, 2010) has demonstrated that no mandatory Ma-ϕ boundary separates the restrictive relative from its head.<sup>6</sup> In (3), adapted from Patin (2010: 197), the tone of the subject noun *mwidzĩ* ‘thief’ is able to shift to the first syllable of the verb *yaĩba* ‘who stole’, contrary to what occurred in (2a) when the verb was not in a relative form. (The presence of an Intonation Phrase associated with the relative in (3) and the subsequent examples, and the alignment of the boundaries of this ι, will be discussed in the following sections.)

- (3) [ (e=mw-idzi yá-iba n-dovu)<sub>ϕ</sub> (ha-'táwa)<sub>ϕ</sub> ],  
 AUG<sub>1</sub>=1-thief 1.PFV.REL-steal 9-elephant 1.PFV-run away  
 ‘The thief who stole an elephant ran away.’

The lack of any boundary between the head and the relative is also observable when the head of the relative is the direct or indirect object of the relative (4), or when the head is separated from the verb in the relative form by another prosodic word (5). In (4), the tone of the noun *mlevĩ* ‘drunkard’ is free to shift to the root of the verb in its relative form and in (5), the tone of the noun *fĩo* ‘book’ shifts to the first syllable of the noun *Marĩ* ‘Mary’.

- (4) [ (ye=m-levi na-m-vúmbú<sup>w</sup>a)<sub>ϕ</sub> (ha-'wú)<sub>ϕ</sub> ],  
 AUG<sub>1</sub>=1-drunkard 1SG.PFV.REL-OM<sub>1</sub>-speak about 1.PFV-fall  
 ‘The drunkard I talked about fell.’
- (5) [ [ (ye=f-io Marĩ ya-(n-<sup>7</sup>)niká)<sub>ϕ</sub> ], (ŋgafĩ-n-leme'záo)<sub>ϕ</sub> ],  
 AUG<sub>7</sub>=7-book Mary 1.PFV.REL-OM<sub>1SG</sub>-give 7.IPFV-OM<sub>1SG</sub>-bore  
 ‘The book Mary gave me bores me.’

In Patin (2010), it was suggested that no prosodic boundary has to separate the head of a restrictive relative from what precedes it, but this idea was not supported by clear evidence.<sup>8</sup> In (6) below, the tone of the initial verb *ŋgamdzúo* ‘I know’ shifts to the first syllable of the relative marker *ikáo* through the head *mndu* ‘person’. Relatives beginning with *ikáo* are possible alternatives to the more common structures exemplified before, which can be selected in contexts that remain to be clarified but seem to involve givenness.

<sup>6</sup> The presence of a boundary in such a situation is frequent, however, when the head of the relative is the object of the verb of the matrix clause, most probably because of eurythmic constraints.

<sup>7</sup> The 1SG object marker, which is not high-toned, is deleted due to OCP.

<sup>8</sup> Patin (2007: 167) offers an example that supports this claim, similar in nature to (6) above: *ŋgamwono mndu hulimo* ‘I see a person who cultivates’ (slightly modified). However, recordings are unavailable for the purposes of verifying the data.

- (6) [ [ (ŋgam-dʒuo m-nɗu í-ka-ó)<sub>ϕ</sub> (ha-mone'sá)<sub>ϕ</sub> (le='píʃa)<sub>ϕ</sub> ]<sub>i</sub> ]<sub>i</sub>  
 1SG.IPFV-know 1-person 9-be-REL 1.PFV-show AUG<sub>5</sub>=5.picture  
 'I know (someone) who he showed the picture to.'

If a restrictive relative phrases with its head, a prosodic boundary separates the head of a non-restrictive relative from what follows. Example (7) below, adapted from Patin (2007: 201), compares the non-restrictive (7b) with the corresponding restrictive (7a). In the latter case, the tone of the noun *mleví* 'drunkard' shifts to the first syllable of the verb of the relative clause. In (7b), the tone of the same word is blocked on its final syllable, indicating that there is (at least) a prosodic boundary between the head and the relative.

- (7) a. [ (ye=m-leví yá-ona n-dovu)<sub>ϕ</sub> (ha-ro'á)<sub>ϕ</sub> ]<sub>i</sub>  
 AUG<sub>1</sub>=1-drunkard 1.PFV.REL-see 9-elephant 1.PFV-leave  
 'The drunkard who saw an elephant left.'
- b. [ (ye=mleví)<sub>ϕ</sub> [ (yaona ndovú)<sub>ϕ</sub> ]<sub>i</sub> (haro'á)<sub>ϕ</sub> ]<sub>i</sub>  
 'The drunkard, who saw an elephant, left.'

## 2.2 The prosody of the right boundary of relative clauses

No clear reference to the prosody at the right boundary of restrictive relative clauses was included in Patin (2007, 2010). Two main reasons explain this lack of information, neither of which are satisfactory. First, the corpus upon which the analyses were built lacked the sentences that may have helped to decide if these structures were right-aligned with a specific boundary: no sentence was tested where the first of the two objects was specified by a relative, for instance, and most of the relatives that were tested preceded the VP of the matrix clause or were utterance-final. Second, Patin (2007, 2010) followed Cassimjee and Kisseberth (1998) by considering that the main clue for Intonation Phrases was extraprosodicity, a non-finality pattern where the shift of the tone cannot extend to the final syllable of the group: in (10), for instance, the final tone does not shift on the final syllable of the utterance. However, extraprosodicity "always applies at the end of a sentence, [but] optionally applies at the end of a clause" (Patin 2010: 193). It was and remains unclear how this optionality is driven, even if it seems clear that emphasis is involved. Patin (2010) does not discuss this point in detail.

My account of Intonation Phrases changed in 2015, when O'Connor and Patin (2015), in a paper dedicated to apposition in Shingazidja, provided evidence that boundary tones (H% for a non-final Intonation Phrase, L% for a final) were more robust clues for this prosodic group than extraprosodicity, a claim that was supported by additional evidence in Patin (2017). Additional clues were the successive downsteps of group-internal tones and the optional presence of pauses before and after the group. While there is no doubt that extraprosodicity can regularly be observed at the end of structures that typologically align with Intonation Phrases, H% almost always appears in the same context in Shingazidja. In (8), illustrated in Figure 1, an H% is associated with the tone of *dáho* 'home'. If there were no H%, the tone of this latter word would have been downstepped in regard to the previous tones.

- (8) [ (le=dʒirani)<sub>ϕ</sub> (ha-reŋge'zá) (le=dáhó)<sub>ϕ</sub> ], [ (rahá)<sub>ϕ</sub> (wo=wa-dʒe'ní)<sub>ϕ</sub> (we-dʒá-dʒá)<sub>ϕ</sub> ],  
 AUG<sub>5</sub>=5.neighbour 1.PFV-order AUG<sub>5</sub>=5.home before AUG<sub>2</sub>=2-visitor  
 2.HYP-PFV-come  
 'The neighbour cleaned the house before the guests came.'

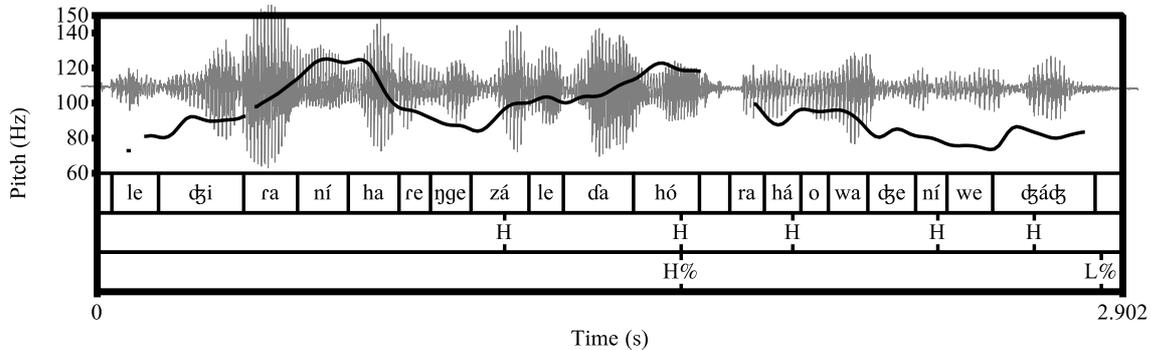


Figure 1. Waveform and F<sub>0</sub> associated with (8)

As explained in the introduction of this paper, the intonation of restrictive relatives is mentioned in Patin (2017), but the short overview was inconclusive. No H% was observable in an example very similar to (7a) (see Patin 2017: 298-299). However, a sharp rise of the F<sub>0</sub> was observable on the final vowel of *mabám̄bu* 'present' in (9) (adapted from Patin 2017: 303).

- (9) [ [ (wa-dʒeni wa-wá<sup>9</sup>-n̄ika ma-bám̄bú )<sub>ϕ</sub> ], (wa-<sup>1</sup>dʒíβiwa)<sub>ϕ</sub> ],  
 2-visitor 2.PFV.REL-OM<sub>2</sub>-give 6-present 2.PFV-please.PAS  
 'The visitors to whom they gave gifts are pleased.'

As already mentioned, the latter example was followed by the following comment: "Note that the insertion of an Intonation Phrase boundary in [(9)], signaled by an H%, must be linked to the length of the sentence and idiolectal variation, since it has previously been shown that not all relatives are followed by an H%" (Patin 2017: 303). This idea will be explored in the following sections.

Before turning to this point, however, a short remark about non-restrictive relatives. In Patin (2010), no specific information on the right prosodic boundaries of these structures was provided. In addition to the information already given on the presence of a boundary separating the head from the relative, it was indicated that the non-restrictive relative is "frequently realized in a higher register than the matrix clause", and that it "is regularly delimited on its left and its right by pauses" (Patin 2010: 205). This last element, combined with the extraprosodicity that could emerge after these structures, led me to claim that non-restrictives could be followed by an Intonation Phrase boundary.

<sup>9</sup> In the past relative tense, the object marker emerges as a toneless allomorph (see Patin 2010: 196).

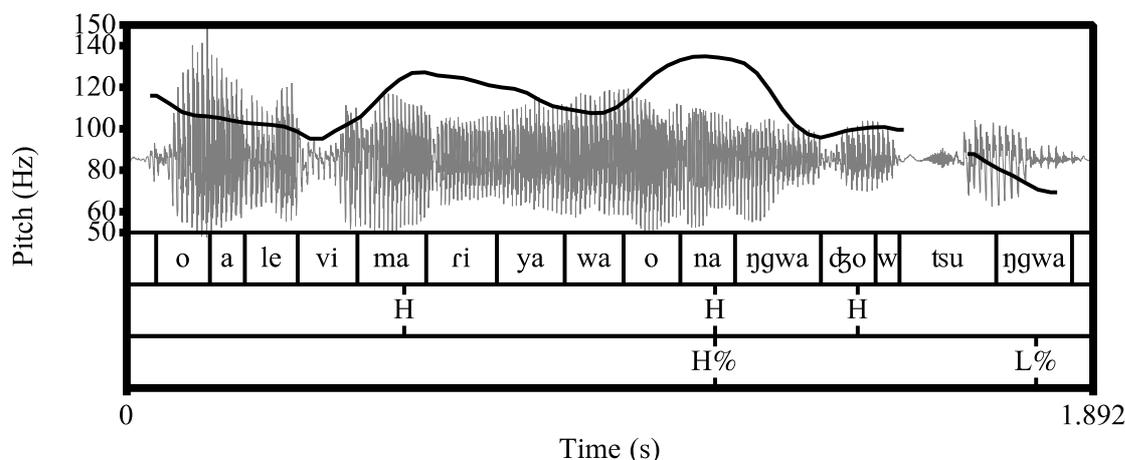
### 3. In search of H%<sub>s</sub>

In this section, the results of an exploration of the corpus are discussed. This corpus was built for the BantuPsyn project, the first year of which was dedicated to the prosody of relative clauses in Bantu, and led to Downing et al.'s (2010) edited volume. This corpus was already used for Patin (2010). However, since the importance of boundary tones in Shingazidja was highlighted in subsequent works, no systematic examination of their presence or absence was conducted for this latter paper. In section 3.1, the results of this quest for restrictive relatives are shown, while the presence of H%<sub>s</sub> in non-restrictive relatives is discussed in section 3.2.

#### 3.1 H%<sub>s</sub> at the right boundary of restrictive relatives

When the head of a restrictive relative is the subject of the sentence, i.e. when the relative precedes the verbal phrase, an H% tone almost always emerges at the end of the relative (see section 4 for a discussion of the few exceptional cases). A representative example is provided in (10) and Figure 2 below.

- (10) [ [ (wo=wa-leví Mári ya-wa-oná )<sub>ϕ</sub> ], (ɲgwa-<sup>1</sup>dʒó-[h]w-<sup>1</sup>tsúŋga )<sub>ϕ</sub> ],  
 AUG<sub>2</sub>=2-drunkard Mary 1.PFV.REL-OM<sub>2</sub>-see 2PL.IPFV-FUT-15-swim  
 ‘The drunkards who Mary saw are going swimming.’



**Figure 2.** Waveform and F<sub>0</sub> associated with (10)

In Figure 2, a sharp rise in pitch can be observed at the end of the relative (the height of the tone of the verb *yawaóna* ‘who (s)he saw’ is higher than that of the tone that shifts on *Mári* ‘Mary’), while a downstep of the tone of the relative verb would have been expected if no Intonation Phrase boundary followed it.

The example in (11) and Figure 3 below illustrate the alignment of the H% at the end of the relative clause vs. e.g. the end of the verb.

- (11) [ [ (wa-nɔ̃ w-andziáɔ )<sub>ϕ</sub> (haru<sup>1</sup>mwá )<sub>ϕ</sub> (ye=siasá )<sub>ϕ</sub> ]<sub>l</sub> ]<sub>i</sub>  
 2-person 2.IPFV.REL-welcome inside AUG<sub>9</sub>=9.politics  
 (ɲgwa-menye<sup>1</sup>háɔ )<sub>ϕ</sub> ]<sub>i</sub>  
 2PL.IPFV-break.NEU  
 ‘Persons who enter politics are corrupt.’

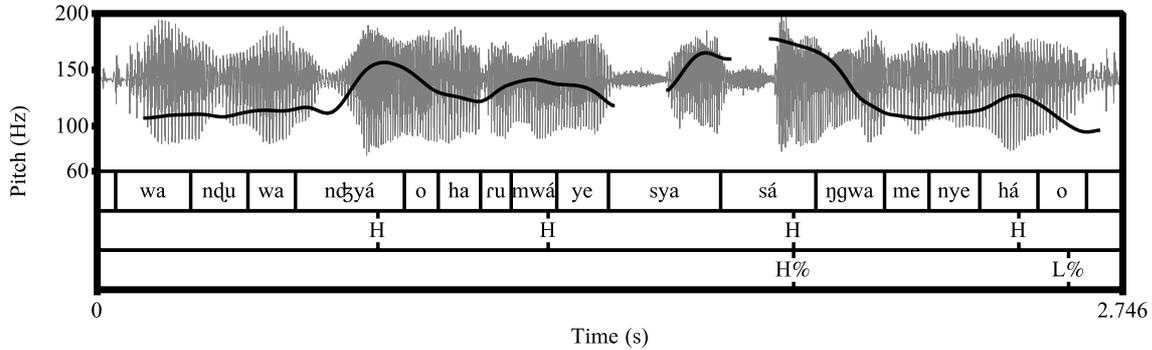


Figure 3. Waveform and F<sub>0</sub> associated with (11)

As can be observed in Figure 3, the tone of *harúmwá* ‘inside’ is downstepped in regard to the first tone of the utterance, thus highlighting the presence of the boundary tone at the end of the word *siásá* ‘politics’.

However, part of the data reveals that the H% tone aligns with the final high tone, rather than with the end of the relative clause. Compare for instance (10) and Figure 2 with the following example, (12), and the corresponding figure (Figure 4) – see also (17) and Figure 8.

- (12) [ [ (wo=w-ana-wá-ʃe Mari ya-wá-on-a)<sub>ϕ</sub> ]<sub>i</sub> (ɲgwa-<sup>1</sup>dʒó-[h]w-tsuŋga )<sub>ϕ</sub> ]<sub>i</sub>  
 AUG<sub>2</sub>=2-child-2-woman Mary 1.PFV.REL-OM<sub>2</sub>-see 2PL.IPFV-FUT-15-swim  
 ‘The girls who Mary saw are going swimming.’

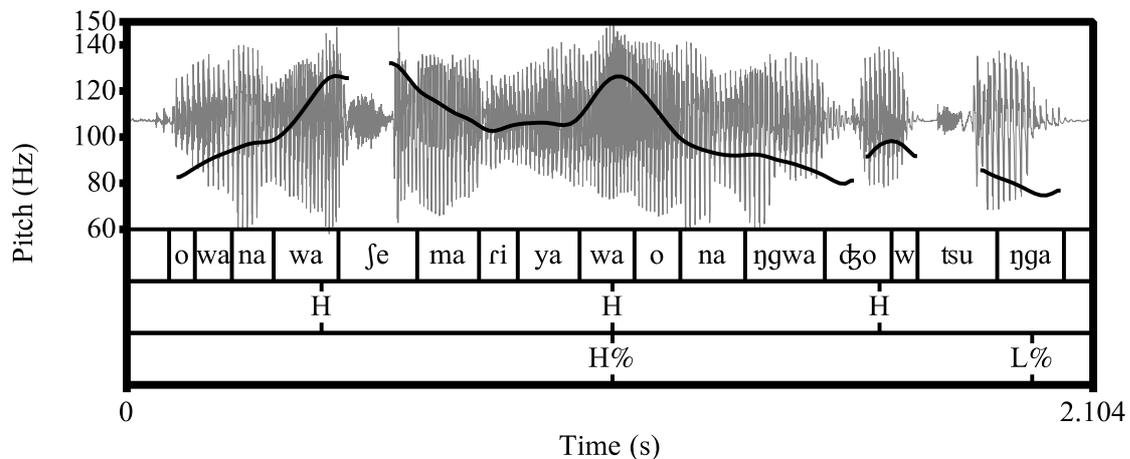


Figure 4. Waveform and F<sub>0</sub> associated with (12)

In (12), the first tone of the head *wanawáfe* ‘women’ is blocked on its penult because the final syllable of the noun is underlyingly high.<sup>10</sup> As a consequence, the tone of *Mari* ‘Mary’ is free to emerge, and its shift stops on the antepenult of the relative verb *yawaóna* ‘who (s)he saw’. As can be observed in Figure 4, this latter tone is not downstepped in regard to the first tone of the sentence, indicating that the relative clause is followed by an Intonation Phrase. The alignment of H%’s with lexical tones has been identified in another Bantu language, namely Mbochi, a language of the Congo (Beltzung, Rialland and Embanga 2010).

There is no formal account of the alignment of H%’s with H tones in Mbochi, built upon rules and/or constraints, in Beltzung, Rialland and Embanga (2010). What is claimed is that “[I]es tons de frontière du mbochi sont différents des tons lexicaux (ou grammaticaux): ils ne sont pas réalisés sur les mêmes niveaux que les tons H et B: ils se surimposent aux tons, entraînant la formation de variantes tonales relevées ou rabaissées”.<sup>11</sup> What motivates this alignment remains unclear at this point. Perhaps the H% is attracted to the H in a similar way as the tone is attracted to stress/accent (Goldsmith 1987, de Lacy 2002). Patin (2020), using the Optimal Domains Theory framework (Cole and Kisseberth 1994, Cassimjee and Kisseberth 1998), proposes that the right boundary of an intone domain aligns with the right boundary of the final high tone in these situations. However, it is necessary to better understand the phenomena before trying to propose an explanation and, even more so, a formalization. It is in fact difficult, on the basis of the data available to us, to know what objects are hidden behind the tonal enhancements at the end of the relative in Mbochi or Shingazidja. Are these really boundary tones associated with the right boundary of Intonation Phrase, which would subsequently target the last lexical high tone? Or should we rather understand them as floating intones/accents, similar to the so-called “melodic tones”? In the latter case, we would still have to explain why they are associated with the last high tones of the prosodic group. On the other hand, it should be recognized that nothing tells us if what is usually labelled as boundary tones actually corresponds to elements that are associated with a boundary at all stages of a derivation, except for the application of Occam’s Razor. The strong prosodic variation that characterizes Shingazidja may delay the emergence of answers to these questions, but we can hope that a systematic examination of the distribution of F<sub>0</sub> risings at the end of Intonation Phrase, beyond the case of relatives, will allow us to know more soon.

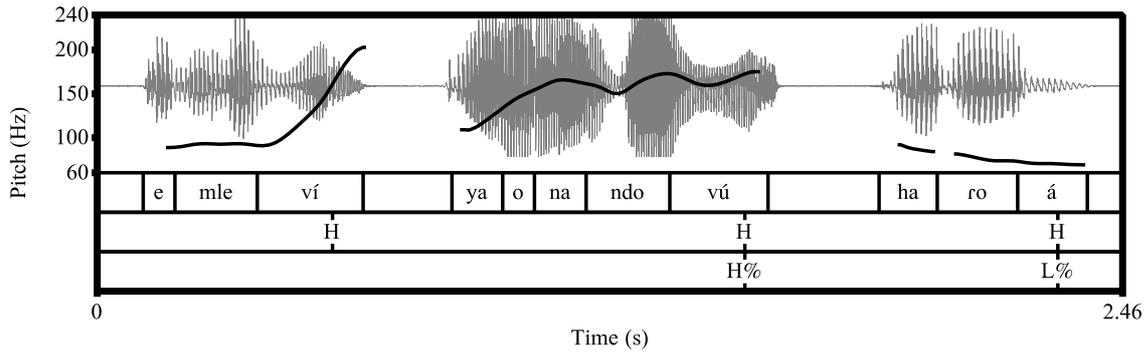
### 3.2 H%’s at the right boundary of non-restrictive relatives

Like the restrictive ones, the non-restrictive relatives are systematically aligned on their right with an H%. The example in (7b) proposed earlier can be used as a representative example, repeated here in (13) for convenience and illustrated in Figure 5.

- (13) [ [ (ye=m-leví )<sub>ϕ</sub> [ (ya-ona ndovú )<sub>ϕ</sub> ], (haro<sup>1</sup>á )<sub>ϕ</sub> ],  
 AUG<sub>1</sub>=1-drunkard 1.PFV.REL -see 9-elephant 1.PFV-leave  
 ‘The drunkard, who saw an elephant, left.’

<sup>10</sup> As indicated in the glosses in (12), the noun *wanawáfe* ‘women’ is a compound, which associates the lexemes *wána* ‘children’ and *wafé* ‘females’. The tone that emerges on the penult of *wanawáfe* ‘women’ thus results from the shift of the tone of the first syllable of the word.

<sup>11</sup> A translation by the author is the following: “the boundary tones of Mbochi are different from the lexical (or grammatical) tones: they are not realized on the same levels as H and L tones: they are superimposed on the tones, leading to the formation of raised or lowered tonal variants”.



**Figure 5.** Waveform and F<sub>0</sub> associated with (13)

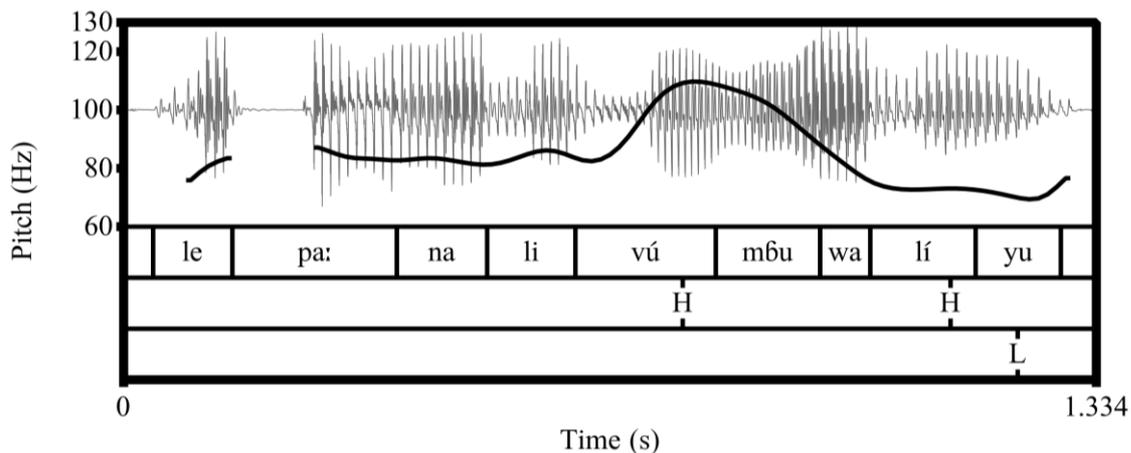
Interested readers are directed to illustrations in Patin (2010: 204): in Figure 7, associated with the example (27b) of this text, a sharp rise of the F<sub>0</sub> is observable at the end of the relative, indicating that it is followed by an Intonation Phrase boundary.

#### 4. The role of eurythmic constraints

In the previous section, it was explained that an H% is aligned with the end of a relative clause, whether it is a restrictive or a non-restrictive relative, indicating that such a structure is followed by an Intonation Phrase boundary. However, as previously elaborated, no H% is observable at the end of some relatives. How is it then possible to explain these exceptions to the general pattern?

Examination of the data reveals that restrictive relatives that are not clearly associated with an H% are all short, usually consisting of two prosodic words. Example (14) below and the corresponding Figure 6 is representative of this trend.

- (14) [ [ (le=paha na-li-vúmbwa)  $\phi$  (l<sup>h</sup>í-yu)  $\phi$  ],  
 AUG<sub>5</sub>=5.cat 1SG.PFV.REL-OM<sub>5</sub>-speak about 5.PFV-fall  
 ‘The cat I talked about fell.’



**Figure 6.** Waveform and F<sub>0</sub> associated with (14)

While it is not straightforward to determine the phonological nature of what constitutes the rise of the  $F_0$  on the relative verb *nalivumbúá* ‘it that I talked about’ – in other words, to be sure that the H tone is not associated with an H% due to the lack of a prior reference point – the low height seems to indicate that no boundary tone enhances the lexical tone in this example.

The fact that the length of the elements involved affects the phrasing of the utterance confirms the implication of eurhythmic constraints – a set of constraints that are built upon the idea that length and prosodic weight play a role in the determination of prosodic categories (Ghini 1993). An example of a eurhythmic constraint as defined in the Optimality Theory framework is provided in (15):

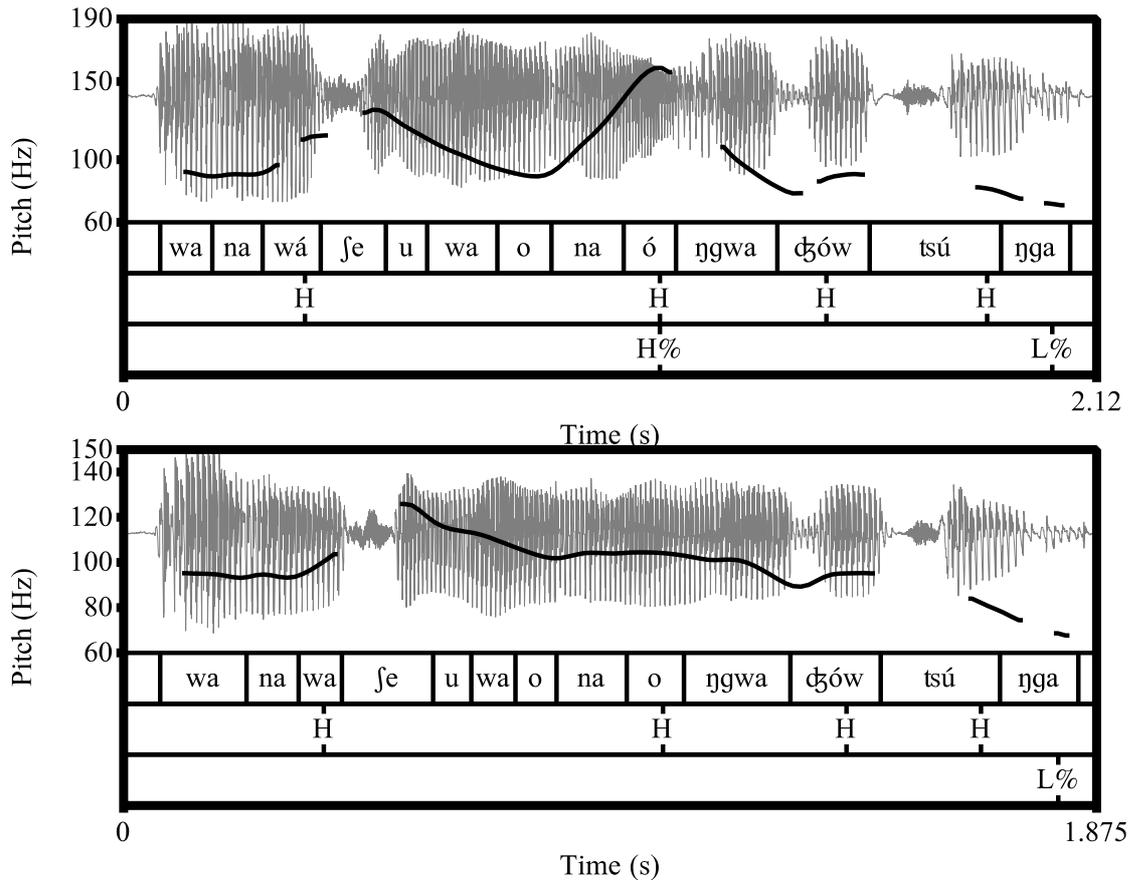
- (15) MAX-BIN: (Prieto 2007: 41, following Sandalo and Truckenbrodt 2002: 295)  
Phonological phrases consist of maximally two prosodic words.

Evidence for eurhythmic constraints in the distribution of H%s in Shingazidja comes from examples such as (16).<sup>12</sup>

- (16) { [ ] } [ (w-ana-wá-f<sub>ē</sub> u-wa-onaó )<sub>ϕ</sub> { ],<sub>i</sub> } (ŋgwa-<sup>1</sup>dʒó-[h]w-<sup>1</sup>tsúŋga )<sub>ϕ</sub> ],<sub>i</sub>  
2-child-2-woman 1.REL.PFV-OM<sub>2</sub>-see 2PL.IPFV-FUT-15-swim  
‘(Some) girls who you see are going swimming.’

Figure 7 offers two realizations of (16). The top part of the figure illustrates a realization of (16) at a normal speech rate, while the bottom part of the figure illustrates a realization of (16) when the speaker was asked to produce a faster version (compare the durations below each part of the figure). In the former case, a sharp rise of the  $F_0$  is clearly observable at the end of the relative, revealing that it is most probably followed by an Intonation Phrase boundary. No such rise is observable in the curve in the bottom part of the figure, where every tone is downstepped in regard of the preceding one.

<sup>12</sup> The ‘<sub>i</sub>’ below the final vowel of the relative verb *uwaonaó* ‘these who you see’ indicates that it is as if the underlying tone was not associated with this vowel. The fact that allomorphs lacking certain underlying tones can be selected in Shingazidja was first identified by Cassimjee and Kisseberth (1989). It is not clear what motivates these alternations, but Patin (2018) proposed that they are part of a conspiracy of rules linked to the evolution of the prosodic system of the language from a tonal language to an accentual language.



**Figure 7.** Waveform and F<sub>0</sub> associated with (16); the top panel corresponds to iteration at a normal speech rate and the bottom panel to iteration at a fast speech rate

It is not surprising that eurhythmic constraints play a role in the prosodic alignment of restrictive relatives in Shingazidja. Although these constraints have not been studied in detail in this language, their likely presence and effects on phrasing have appeared in several papers (e.g. Patin 2010, O'Connor and Patin 2015, Patin 2017). Moreover, the prosody of Comorian languages generally varies greatly depending on whether the number of words involved in an utterance is limited or not. Describing Shimaore, a Comorian language spoken in Mayotte (an oversea department of France), Philippson (2005: 213) writes: “If the [Phonological Phrase] comprises more than two [tone] domains, domain brackets will be erased, the final syllable will be made extrametrical, and a left-dominant binary foot constructed from right to left over the last two syllables” (compare (17a), where the tone patterns are similar to those in Shingazidja, and (17b), illustrating Philippson’s claim).

(17) Shimaore (Philippson 2005: 213, slightly modified)

- a.    bawá pána                    ‘broad wing’  
      bawá dzidu                 ‘black wing’
- b.    tsisihangiha bárua         ‘I am not writing – a letter’

More broadly, many studies devoted to the prosody of Bantu languages have revealed the importance of eurhythmic constraints in their phrasing (e.g. Bickmore 1990, Selkirk 2011). Downing and Mtenje (2011b) showed that prosodic groupings of Chicheŵa (a Bantu language from

Malawi), which played a significant role in the development of WRAP constraints (Truckenbrodt 1999), were broken when modifiers were associated with the lexical heads in the utterance.

It is not clear how eurythmic constraints work in Shingazidja. A comparison of examples (14) and (16) reveals that the number of words involved is not the only parameter involved, and we have just seen that speech rate must also be taken into account. The precise evaluation of the effects of these constraints cannot be done without further studies conducted on a larger number of speakers. However, it is quite clear that it is not the number of prosodic words that follow the relative that matters, as can be observed in (18) and Figure 8 below.

- (18) [ [ (tsi-tsa<sub>há</sub>)<sub>ϕ</sub> (wo=w-anazió<sub>ni</sub><sup>13</sup> w-enda-<sub>o</sub>)<sub>ϕ</sub> (haru<sup>1</sup>mwá)<sub>ϕ</sub>  
 1.PFV-look for AUG<sub>2</sub>=2-student 2.REL.IPFV-go-REL inside  
 (le=bu<sub>ndzi</sub>líy<sub>o</sub>)<sub>ϕ</sub> ], (wá-ni-swá<sub>mi</sub>hi)<sub>ϕ</sub> ],  
 AUG<sub>5</sub>=5.meeting 2.PFV-OM<sub>1SG</sub>-forgive  
 ‘I asked the students who are going to the meeting to excuse me.’

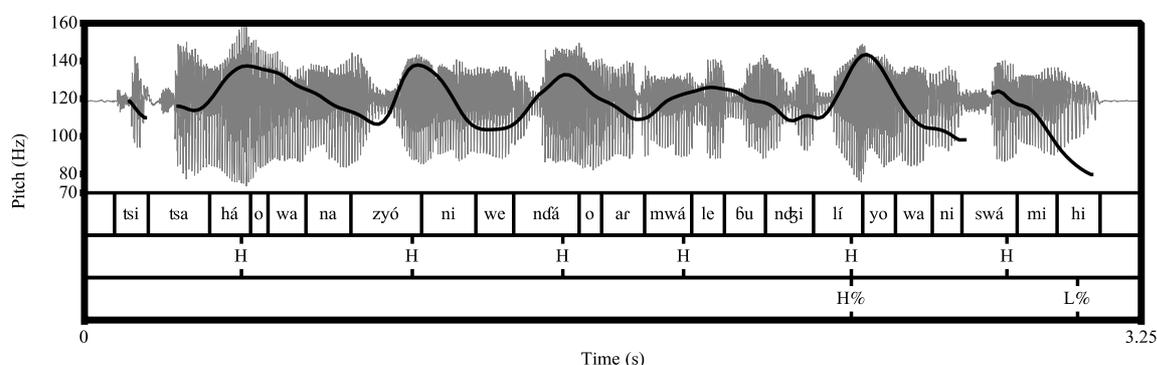


Figure 8. Waveform and F<sub>0</sub> associated with (18)

The peak of F<sub>0</sub> is associated with the end of the relative in Figure 8, even if the relative is made of four prosodic words, including the head which is followed by only one prosodic word.

Finally, it should be noted that the effect of eurythmic constraints does not seem to apply to non-restrictives, which are all associated with an H%, regardless of their length (see for instance (13) and Figure 5, where the relative is very short). At this stage of the research, it is difficult to explain what might motivate this difference in behaviour. Following de Vries (2006), O'Connor and Patin (2015) claimed that non-restrictive appositions (thus including non-restrictive relatives) are in the complement position of a functional head, and:P – a proposal that led them to put forward that, building upon an analysis of the intonation patterns, non-restrictive clauses are associated with Intonation Phrase that are prosodically embedded in the Intonation Phrase of the matrix clause. If the restrictive relatives do not exhibit such a property, recursion could be a key to accounting for the differences in the behaviour of the two structures, with e.g. embedding preventing the fall of the H%, or blocking the application of eurythmic constraints. In order to explore such hypotheses, it will be necessary to know more about the acoustic cues that characterize the left border of Intonation Phrase. Further research is thus required.

<sup>13</sup> The noun *wanazióni* ‘students’ originally is a compound that associates the lexemes *w-ána* ‘children’ and *z-ió=ni* ‘schools (lit. 2-book=in)’. While the structure of the word is transparent to the speaker (the prefix of the second part of the compound alternates in the singular form: *mna*fi*ó*ni**), the noun is fully lexicalized.

## 5. Conclusion

Many studies in recent years have been devoted to the prosody of relative clauses in Bantu languages, and some of them have played a significant role in the debates associated with the phonology-syntax interface. Previous works on this issue in Shingazidja have revealed a phrasing distinction between restrictive and non-restrictive relatives which is common to many languages in this family (and beyond), but the nature of the prosodic boundaries aligned to the right of the relatives was not clear. The purpose of this work was to determine whether the end of relatives is aligned with an H%, the main correlate of Intonation Phrases in Shingazidja, and to provide some explanation for the variation.

An examination of a corpus collected in 2009 reveals that both restrictive and non-restrictive relatives do have an H% on their right boundary, but that this boundary tone is rather aligned with the last surface high tone than with the last vowel of the utterance. The exceptions to this generalization are utterances with short restrictive relatives, indicating that the prosody of these structures is affected by eurhythmic constraints.

Many questions related to the prosody of relatives in Shingazidja are still waiting to be answered. Beyond a detailed characterization of the nature of the eurhythmic constraints that have been assumed in this paper, we lack knowledge about the existence and, if there is an existence, the position of the left boundaries of the Intonation Phrases associated with these constructions. The identification of clues to answer these questions will be the subject of a future work.

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