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Aspects of the intonational phonology of Bàsàá

Abstract: Two major aspects of the intonational phonology of Bàsàá, a Northwest Bantu language spoken in Southern Cameroon with an underlying opposition between high, low and toneless tone bearing units, are presented in this chapter. First, two tonal processes, high tone spreading (HTS) and falling tone simplification (FTS), show sensitivities to prosodic domains: the phonological phrase and the intonational phrase, respectively. Second, tones do not seem to be affected by sentence modalities or information structure. Declarative sentences and *yes-no* questions show nearly identical intonation patterns, and varying the location of focus in a sentence does not significantly affect sentence prosody either. So far, Bàsàá is a language that shows little interaction between tone and intonation.

Keywords: Bàsàá, Tone and tone rules, Intonation, Prosodic structure, Absence of focus marking

1 Introduction

This chapter presents tonal and intonational aspects of Bàsàá, a narrow Bantu language (A43 in Guthrie's classification), spoken by approximately 300,000 people (SIL 2005, Lewis et al. (2015)) in southern Cameroon. Most of the Bàsàá speakers are found in the Littoral Region – within the Sanaga Maritime, the Wourri and the Nkam divisions – and in the Center Region of Cameroon – within the Nyong and Kelle Divisions. Bàsàá is also used as a language of trade with neighboring and related ethnic groups, like the Bakoko and the Bati. In this chapter we concentrate on Bàsàá as it is spoken in Nyong and Kelle. A number of studies on Bàsàá report and analyze tonal and segmental processes (Bot ba Njock, 1970; Lemb and De Gastines, 1973; Dimmendaal, 1988; Bitjaa Kody, 1993; Hyman, 2003; Makasso, 2008; Hamlaoui et al., 2014; Hamlaoui and Szendrői, 2015). An overview of the sound system appears in Makasso and Lee (2015).

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First, we will present the basic features of the Bàsàá tonal system and tonal processes. After discussing new findings from data on intonation with respect to sentence modality, the (in-)sensitivity of intonation to information structure will be presented.

2 Tone

2.1 Tonal inventory

Bàsàá is a tonal language. The pitch of a word can thus determine its core-meaning (Yip, 2007). The studies that have addressed the tonal aspects of this Northwest Bantu language generally agree on the fact that Bàsàá underlyingly distinguishes high-toned (H) and low-toned (L) tone bearing units (TBUs). Additionally, certain tense affixes, verbal extensions and noun-class prefixes have no underlying tone of their own, suggesting that Bàsàá displays an underlying ternary opposition between H, L and \emptyset . For example, the Past 1 tense marker (-*n*-) is an underlyingly toneless TBU (Bitjaa Kody, 1993), which acquires its tone from an immediately preceding TBU. This tense marker thus surfaces with a H tone if it is preceded by a H-toned subject marker, as in (1)a. After a L-toned subject marker as in (1)b, the Past 1 marker surfaces with a L tone that is inserted by default.¹

- (1) a. ɓ-ɔ̀r ɓá-ń-téhé ɓ-ɔ̀ngé
 2-people 2.AGR-PST1-see 2-children
 ‘The people saw the children.’
- b. sóyól à-ń-téhé ɓ-ɔ̀ngé
 1.grandfather 1.AGR-PST1-see 2-children
 ‘The grandfather saw the children.’

As a result of a number of tonal processes, on the surface Bàsàá shows a 5-way tonal opposition: H, L, ↓H (called “downstepped” H), LH, HL. Minimal tonal contrasts are given in Fig. 1.

¹ Abbreviations: AGR: agreement, AUG: augment, CONN: connective, DEM: demonstrative, FTS: falling tone simplification, HTS: High tone spread, LOC: locative, PRES: present, PRO: pronoun, PST: past

through the loss of a syllable nucleus. The former process is illustrated in (4), where the H of the first syllable of the verb ‘to help’ spreads onto the second syllable – underlyingly specified as L – which, as a result, surfaces with a falling tone. The latter process is illustrated in (5), where the historical loss of a syllable resulted in the delinking of a L tone which reassociates to the left, and creates a falling tone on the remaining syllable of the noun stem ‘udder’.

(4) -hól + -à → hólâ ‘to help’ (High Tone Spreading) 

(5) Proto Bantu *-bédè → Bàsàá -bê ‘udder’

As for LH tones, they result from the loss of a final vowel (6) or a medial vowel (7) (Bitjaa Kody, 1993).

(6) nàní (Western dialect) → nǎŋ (Eastern dialect) ‘bed’

(7) lì- + -áy → jǎy ‘flyswatter’

Bisyllabic word stems exhibit the four surface tonal patterns illustrated in (8) to (11) respectively: HH, LH, LL, and H-HL (Hyman, 2003). The H-HL pattern in (11) results from an extension of the initial H to the right (High Tone Spreading).

(8) a. /kwémbé/ → [kwémbé] ‘box’

b. /sókól/ → [sóyól] ‘grandfather’

(9) a. /hi-nùní/ → [rìnùní] ‘bird’

b. /nùká/ → [nùyâ] ‘animal’

(10) a. /lòlò/ → [lòlò] ‘duck’

b. /ma-kàlà/ → [màkàlà] ‘doughnuts’

(11) a. /kémbè/ → [kémbê] ‘goat’

b. /li-péhèl/ → [lìpéhêl] ‘comb’

No automatic prominence on the penultimate or final vowel is observed in Bàsàá. If anything, segmental contrasts suggest that the initial syllable of a stem has a privileged prosodic status as the word’s head (Hyman, 2003). No

prosodic correlates of this status as a word head has however been identified so far.²

Now that we have laid out some basic facts concerning the tonal system of Bāsàá, let us turn to two major tonal processes, which are the main source of contour tones and downstepped H tones: **High Tone Spreading** (Dimmendaal, 1988; Hyman, 2003; Hamlaoui et al., 2014) and **Falling Tone Simplification** (Bitjaa Kody, 1993; Hamlaoui and Szendrői, 2015).

2.2 Tonal rules and prosodic structure

According to Hyman (2003), High Tone Spreading (HTS) is the “major tone rule in present-day Bāsàá”. HTS consists in an underlying H tone associating to one or more L/Ø toned TBUs to its right. This tonal rule applies both at the word and phrasal level. At the word level, HTS applies both within the root, as shown in (11), and from a root to one or more derivational suffixes, as shown with the causative extension in (12) (Dimmendaal, 1988; Hyman, 2003).³

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

In Hamlaoui et al. (2014), we argue that HTS, and in particular its bounded nature, provides a window into the prosodic structuring of clauses into separate phonological phrases (noted ϕ), the level of the prosodic hierarchy corresponding to (lexical) syntactic phrases (Selkirk, 1995; Truckenbrodt, 1999). **More precisely, we propose that it allows us to detect the right edge of ϕ s.**

Typically, HTS applies between a verb and a phrase that immediately follows it, suggesting that they form a single phonological phrase.⁴ When the post-verbal

² As pointed out to us by an anonymous reviewer, it is unclear whether segmental contrasts indicate the strong/head status of the initial syllable of a stem. Bantu languages that display penultimate lengthening, such as Chichewa, also display more segmental contrasts in initial position.

³ Examples in (12) show vowel raising in Bāsàá. For further details, see Makasso and Lee (2015) and references therein.

⁴ There are a few exceptions to this generalization. We refer the interested reader to Hyman and Lionnet (2012) on Abo (Bantu, A42), a close relative of Bāsàá, as well as to Makasso (2012). A number of cases are discussed in which the verb fails to assign a H to the word that follows it. We also refer the reader to Hamlaoui et al. (2014) for a detailed discussion of the application of HTS within various types of phrases.

base has an underlying LH tonal pattern, as “animal” in (13), the L tone is reinked and creates a downstep on the following H.

- (13) (sóγól)_φ (à-ń-téhé nú[↓]γá)_φ.
 sóγól à-ń'-téhé núγá
 1.grandfather 1.AGR-PST1-see 7.animal
 ‘The grandfather saw the animal.’

When the post-verbal phrase is monosyllabic and carries a L tone, as “today” in (14), HTS creates a HL tone on that syllable.

- (14) (m-ùr)_φ (à-ń-sèβél lèn)_φ.
 m-ùr à-ń-sèβél lèn
 1-man 1.AGR-PRS-call today
 ‘The man calls today.’

Note that as briefly illustrated by examples (13) and (14), the syntactic nature of the phrase that follows the verb (i.e. argument or adjunct) does not affect the application of HTS (see Hamlaoui et al., 2014, for more detail on this point).

At the clausal level, there are three syntactic contexts in which HTS does not apply. First, HTS never applies between subject and verb, whether the subject is pronominal or not, suggesting that, as expected, separate phonological phrases are formed. This is illustrated in (15) and (16).

- (15) (sóγól)_φ (à-ń-sèβél)_φ.
 sóγól à-ń-sèβél
 1-grandfather 1.AGR-PRS-call
 ‘Grandfather calls.’

- (16) (n-dʒé)_φ (à-ń-sèβél)_φ.
 n-dʒé à-ń-sèβél
 1-who 1.AGR-PRS-call
 ‘Who calls?’

Second, HTS also fails to apply between post-verbal complements whether they are pronominal or not.⁵ In (17), the first post-verbal complement is a noun, while it is a pronoun in (18).

⁵ See however Hamlaoui et al. (2014) regarding the participation of non-subject *wh*-pronouns to HTS, pointing to their clitic status.

- (17) (sóyól)_φ (à-ń-tí ɓóɔŋgɛ́)_φ (mà-kàlà)_φ.
 sóyól à-ń-tí ɓóɔŋgɛ́ ma-kàlà
 1.grandfather 1.AGR-PST1-give 2-children 6-doughnuts
 ‘The grandfather gave the children doughnuts.’

- (18) (sóyól)_φ (à-ń-tí ɓó)_φ (mà-kàlà)_φ.
 sóyól à-ń-tí ɓó ma-kàlà
 1.grandfather 1.AGR-PST1-give 2.PRO 6-doughnuts
 ‘The grandfather gave them doughnuts.’

Finally, HTS also fails to apply between a complement and a modifier of the verb, as in (19), and between modifiers, as in (20).

- (19) (mùr)_φ (à-ń-sèβél m-ááŋgɛ́)_φ (lèn)_φ.
 mùr à-ń-sèβél m-aáŋgɛ́ lèn
 1-man 1.AGR-PRS-call 1-child today
 ‘The man calls the child today.’

- (20) (mùr)_φ (à-ń-sé[↓]βél βí[↓]sú)_φ (βí ndáp)_φ (lèn)_φ.
 mùr à-ń-séβél βísú βí ndáp lèn
 1.man 1.AGR-PST1-call 8.front 8.CONN 9.house today
 ‘The man called in front of the house today.’

The domain of application of HTS is both distinct from and ller than the domain of application of the next tonal process: falling tone simplification (FTS). FTS turns a HL-H sequence into H-[↓]H. Let us illustrate this process by examining the behavior of the phrase *all the children*, which in isolation or sentence final position (as in (21)) displays a final HL tone.⁶

- (21) (, sóyól à-ń-téhé ɓ-ɔɔŋgɛ́ ɓó-ɓá-sò).
 sóyól à-ń-téhé ɓ-ɔɔŋgɛ́ ɓó-ɓá-sò^ˆ
 1.grandfather 1.AGR-PST1-see 2-children 2.PRO-2.CONN-all
 ‘The grandfather saw all the children.’

⁶ The form *sò* ‘all’ derives from the form *sónà* (Lemb and De Gastines, 1973). The loss of the final syllable for certain speakers and in certain contexts creates a floating L tone that either reassociates to the left or to the right, depending on the context.

When the phrase *all the children* is in the subject position and followed by the H-toned subject marker *bá-*, as in (22), the final HL tone simplifies into a H tone and creates downstep on the following H.

- (22) (, b-ɔ̀ɔ̀ŋgɛ́ bɔ́-bá-só ↓bá-m-bárá máŋgòlò).
 b-ɔ̀ɔ̀ŋgɛ́ bɔ́-bá-só` bá-m'-bárá m-áŋgòlò
 2-children 2.PRO-2.CONN-all 2.AGR-PST1-pick.up 6-mangoes
 'All the children picked up the mangoes.'

FTS applies between a verb and the phrase that immediately follows it (23), as well as between any postverbal phrases (24), (25) (when the required tonal configuration is met).

- (23) (, mùr à-n-í ↓ hálà).
 mùr à-n'-ì hálà
 1.man 1.AGR-PST1-arrive like.this
 'The man arrived in this fashion.'
- (24) (, sóyól à-n-tí b-ɔ̀ɔ̀ŋgɛ́ bɔ́-bá-só ↓ ndáp).
 sóyól à-n'-tí b-ɔ̀ɔ̀ŋgɛ́ bɔ́-bá-só` ndáp
 1.grandfather 1.AGR-PST1-buy 2-children 2.PRO-2.CONN-all 9.house
 'The grandfather bought all the children a house.'
- (25) (, lìŋgòm à-n-ɖɛ́ má-kàlà mɔ́-má-só ↓ kékèlà).
 lìŋgòm à-n'-ɖɛ́ ma-kàlà mɔ́-má-só` kékèlà
 Lingom 1.AGR-PST1-eat 6-doughnuts 6.PRO-6.CONN-all morning
 'Lingom ate all the doughnuts in the morning.' (adapted from Bitjaa Kody)

The data we have examined so far suggests that the domain of application of FTS is the intonational phrase (*ι*), the level of the prosodic hierarchy that relates to syntactic clauses (Truckenbrodt, 2007; Selkirk, 2011).

The application of FTS thus reveals what type of clauses form their own *ι*. In this respect, Bàsàá displays the type of root vs non-root clause asymmetry displayed in well-studied languages like English (a.o Downing, 1970; Selkirk, 2011) and observed in a number of other languages (e.g. Xhosa (Jokweni, 1995), Durban Zulu (Cheng and Downing, 2007)). Complement clauses, introduced by *lé* ('that'), do not block the application of FTS, indicating that they do not introduce an *ι* edge at their left edge. This is illustrated in (26).

- (26) (, mè ñ-sòmból jí lǒngé ↓ lé mbómbó à-ñ-lǒ)
 mè ñ-sòmból jí lǒngé lé mbómbó à-ñ-lǒ
 I want to.know well that 1.grandmother 1.AGR-PST1-arrive
 ‘I really want to know that the grandmother came.’
 (Hamlaoui and Szendrői, in press)

Temporal and purpose clauses in post-verbal position also show the application of FTS. In the examples (27) with a temporal clause and (28) with a purpose clause, a surface HL tone on the final mora of the verb is expected. This HL tone would be created when a floating H that accompanies the recent past (PST1) associates with an underlying L on the last mora of these verbs (Makasso, 2012, 2014). However, FTS applies and the final mora of the verbs *arrive* and *leave* has a H tone on the surface, indicating that these clauses do not introduce an ι boundary of their own.

- (27) (, sóyól à-ñ-ké ↓ í ñgéné Lingòm à-ñ-lǒ)
 sóyól à-ñ-ké í ñgéné Lingòm à-ñ-lǒ
 1.grandfather 1.AGR-PST1-leave at hour Lingòm 1.AGR-PST1-arrive
 ‘The grand-father left when Lingòm arrived.’

- (28) (, Lingòm à-ñ-lǒ ↓ lé á-tí jé bídzék)
 Lingòm à-ñ-lǒ lé á-tí jé bídzék
 Lingòm 1.AGRPST1-arrive that 2.AGR-SUBJ.give 1.PRO 8.food
 ‘Lingòm came so that they give him food.’

Crucially, FTS also applies between a root clause and a right extraposed subject clause, as in (29). This suggests that FTS is not sensitive to the right-edge of root clauses.

- (29) (, (, hálà à-jè lǒngé) ↓ lé sóyól à-ñ-dzé jò)
 hálà à-jè lǒngé lé sóyól à-ñ-dzé jò
 so 1.AGR-be.PRES well that 1.grandfather 1.AGR-PST1-eat 9.pro
 ‘This is good that the grandfather ate it.’ (Hamlaoui and Szendrői, in press)

Rather, what is observed in sentences displaying a clause-initial temporal clause (as in (30)) or a fronted object (31), where FTS fails to apply, suggests that FTS is sensitive to the left-edge of intonational phrases. The fact that these clause-initial constituents fail to integrate to the ι formed by the remainder of the sentence is expected – due to the presence of a root-clause left-edge – and independent of the prosodic status of the clause-initial constituent, that is, whether it is itself a ϕ or an ι (Hamlaoui and Szendrői, 2015, Subm).

- (30) (, í ↓ηγέη Lingòm à-η-kê (, sóγól à-η-lô))
 í ηγέη Lingom à-η-kê sóγól à-n'-lò
 at hour Lingom 1.AGR-PST1-leave 1.grandfather 1.AGR-PST1-arrive
 'When Lingom left, the grandfather arrived.'
 (Hamlaoui and Szendrői, Subm)

- (31) (, βòòηγέ βó-βά-sô (, sóγól à-η-téhé βó))
 βòòηγέ βó-βά-sô` sóγól à-n'-téhé βó
 2-children 2.PRO-2.CONN-all 1.grandfather 1.AGR-PST1-see 2.PRO
 'All the children were seen by the grandfather'
 (Hamlaoui and Szendrői, 2015)

Note that, together with other simplification processes, FTS generally limits the distribution of falling tones in Bàsàá. The occurrence of clause-medial HL-H sequences, as for instance in (32) to (34), however further shows that falling tones are not limited to right edges and thus do not constitute a diagnostic for right edges (Hamlaoui and Szendrői, 2015, Subm).⁷

- (32) màlêr à-η-çyé lí-kòndò.
 1.teacher 1.AGR-PST1-eat 6-plantain
 'The teacher ate plantains.'
- (33) à-η-tí ndáp jêm çγòγòp
 1.AGR-PST1-give 9.house 9.my 5.bath
 'He/she gave away my bathroom.'
- (34) à-η-↓gwês nì βèn.
 1.AGR-PRES-like and/with hate
 'He/she likes and hates' (Hamlaoui et al., 2014)

In sum, what we have seen so far is that tonal processes, and in particular HTS and FTS, show how word sequences are phrased in Bàsàá. So far, they provide evidence for two levels of phrasing, the phonological phrase and the intonational phrase (like in most Bantu languages in this volume, except for Embosi and Chichewa). Let us now turn to sentence-level prosody and the (lack of) involvement of tone in expressing certain semantic/pragmatic contrasts.

⁷ The simplification of HL-L sequences into H-L is also possible but seems to be dependent on factors like speech rate. Note also that certain falling tones never simplify, no matter the tonal context or syntactic position. Both issues require further research.

3 Tone and intonation

As pitch differences are used to convey meaningful, phonemic contrasts, a recurring question concerning tonal languages is whether pitch is also used to express postlexical meanings. Wong et al. (2005) have shown that in the Standard Hong Kong dialect of Cantonese, melodic events at phrase edges correlate with different sentence modalities. In this variety of Cantonese, a boundary H tone (H%) at the end of an utterance indicates an incredulous echo question modality, while a HL% expresses the speaker's sense of sudden realization ("Oh I get it!"). Cantonese is but one example of tonal languages that utilize pitch to express postlexical contrasts. Embosi (Bantu C25), a two-tone language similar to Bàsàá, exhibits intonational phrase final L% and HL% boundary tones that mark assertions and *yes-no* questions respectively. These boundary tones are superimposed on the lexical tones and modify their pitch characteristics by either lowering or raising their realization (Embanga Aborobongui et al., 2011; Downing and Rialland, 2012; Embanga Aborobongui et al., 2012) (see also Rialland and Embanga Aborobongui, this volume). In this respect, Embosi displays a crosslinguistically common behaviour, as *yes-no* questions are often marked with a rising intonation (Ultan, 1978; Cruttenden, 1997; Gussenhoven, 2004). Nevertheless, Rialland (2009) has shown that in a number of African languages that are spoken around the equator, just like Bàsàá, *yes-no* questions are characterized by a "lax" question intonation, that is, a final low tone, a low or falling pitch contour or a breathy termination. In this section, we show that sentence modality has little effect on Bàsàá tonal specifications. In Bàsàá *yes-no* questions are primarily marked by morpho-syntactic devices.

3.1 Declarative Sentences

While the effects of postlexical meanings on the realization of tone, if there are any, are expected to occur regardless of the tonal make-up of particular sentences, they are certainly most visible in sentences in which all tones have the same phonological value (Connell, 2001). As briefly illustrated in Fig. 2, sentences which displays a mixed tone sequence present so-called 'automatic downstep', that is, each H subsequent to a L is realized on a lower register than previous H tones. In this type of sentences, it is thus not an easy task to determine which effect is responsible for observed lowerings.

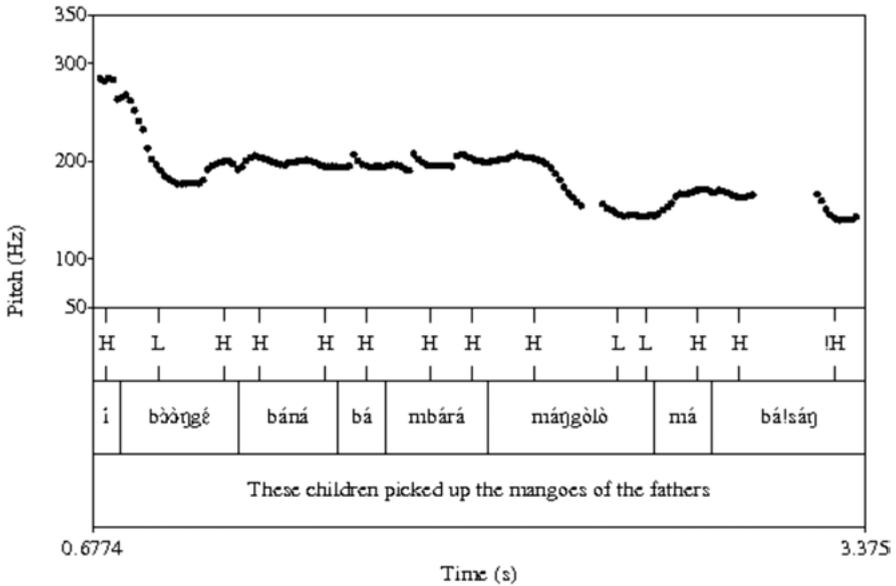


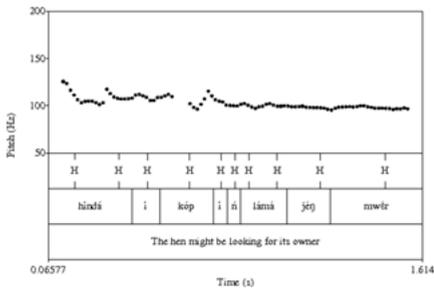
Figure 2: Bāsàá sentence with a mixed tone sequence (see Item 4 in Appendix)

This section thus reports results from a preliminary investigation of the effect of sentence modality on the realization of Bāsàá tones. A set of sentences, with only H tones or only L tones, is recorded in a neutral context. Both types of sentences were produced by a female and a male adult speaker and each sentence was repeated three times. Two illustrative sentences are provided in (35) and in (36).

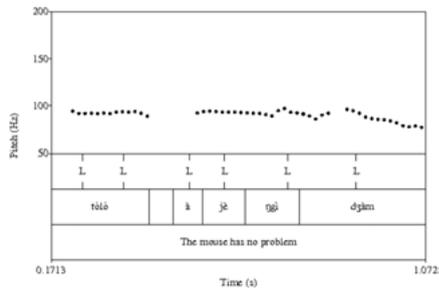
(35) híndá í kóp í-ń-lámá jén ńwér.
 7.black 7.CONN hen 7.AGR-PST1-may search 1.owner
 ‘The black hen may look for its owner.’ all H tone

(36) tòlò à-jè ńgì dżàm.
 1.mouse 1.AGR-be.PRES no problem
 ‘The mouse has no problem.’ all L tone

In Fig. 3a and 4a, pitch tracks of declarative sentences with only H tones are illustrated.



(a) Declarative sentence – High tones only

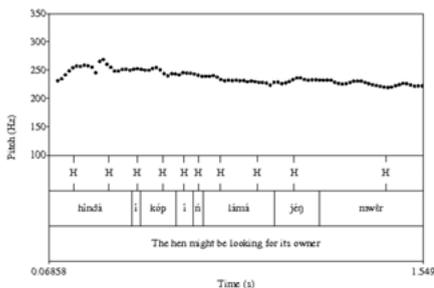


(b) Declarative sentence – Low tones only

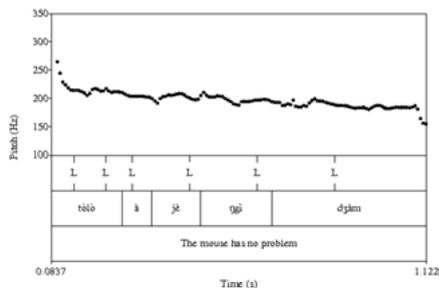
Figure 3: Declarative sentences – Male speaker

There is a slight f_0 declination throughout the sentence and H tones form a plateau until the end of the utterance. The absence of a steeper final lowering toward the end of the sentence suggests that there is no L boundary tone at the end of declarative sentences in Bāsàà.

Declarative sentences with words that only have low tones in Fig. 3b and 4b present similar f_0 patterns as sentences with only high tones. The lowering of f_0 at the end of these sentences is a natural declination, rather than an effect of a low boundary tone.



(a) Declarative sentence – High tones only



(b) Declarative sentence – Low tones only

Figure 4: Declarative sentences – Female speaker

In all sentences we recorded, no particular pitch movement seems to correlate with prosodic phrase edges, indicating that pitch does not serve as an indicator for prosodic phrasing in all H tone or all L tone contexts.⁸

⁸ See however Hamlaoui & Makasso, forth, for evidence that certain successive H tones are distinguished at specific syntactic edges and might be indicators of recursive phonological phrasing.

3.2 Yes-No Questions

In Bàsàá, *yes-no* questions are formed by adding a clause-final question marker {-ε} (glossed as Q) to a corresponding declarative sentence.⁹ There is no change in word order. Two statement-question pairs (a and b, respectively) are presented in (37) and (38).

- (37) a. m̀l̀èr à-ń-↓ɗǵé.
 1.teacher 1.AGR-PRES-eat
 ‘The teacher is eating.’
- b. m̀l̀èr à-ń-↓ɗǵé-è.
 1.teacher 1.AGR-PRES-eat-Q
 ‘Is the teacher eating?’
- (38) a. mùràá à-βí-gwâl.
 1.woman 1.AGR-PST2-give.birth.
 ‘The woman gave birth.’
- b. mùràá à-βí-gwâl-è.
 1.woman 1.AGR-PST2-give.birth-Q.
 ‘Did the woman give birth?’

The surface tonal specification of the question marker depends on the structure and the final tone of the word it attaches to. Whenever the preceding word ends

⁹ Note that the question marker sometimes seems to harmonize with the immediately preceding vowel, as in examples (i) and (ii). An account of this phenomenon extends the scope of the present chapter, so we leave this issue open for future research.

- (i) a. Paul à-nìńí.
 Paul 1.AGR-lie.down
 ‘Paul is lying down.’
- b. Paul à-nìńí-ì.
 Paul 1.AGR-lie.down-Q
 ‘Is Paul lying down?’
- (ii) a. mààngé à-βíí ńwáá.
 1.child 1.AGR-FUT2.take 1.wife
 ‘The boy will take a wife.’
- b. mààngé à-βíí ńwáá-à.
 1.child 1.AGR-FUT2.take 1.wife-Q
 ‘Will the boy take a wife?’

with a coda consonant and carries a final H tone, as in (39) and (40), the question marker realizes a H tone. This contrasts with what is seen in (37) and (38), where it seems to us that the question marker simply realizes a default L tone.¹⁰ Note that no full-fledged analysis of questions has been offered yet.

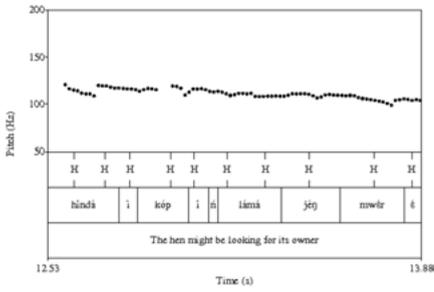
- (39) a. Paul à-gwèé támb.
 Paul 1.AGR-PRES.have 7.shoe
 ‘Paul has a shoe.’
- b. Paul à-gwèé támb-é.
 Paul 1.AGR-PRES.have 7.shoe-Q
 ‘Does Paul have a shoe?’
- (40) a. Paul à-bèèyá màlép.
 Paul 1.AGR-carry.DUR water
 ‘Paul is carrying water.’
- b. Paul à-bèèyá màléβ-é.
 Paul 1.AGR-carry.DUR water-Q
 ‘Is Paul carrying water?’

The interrogative counterpart of sentences (35) and (36) are shown in (41) and (42).

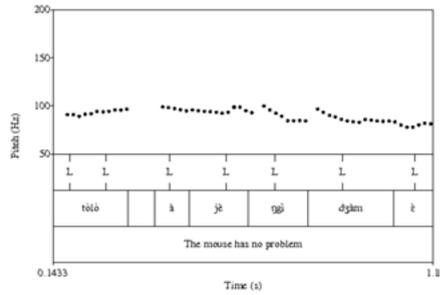
- (41) h́indá í kóp í-ńlámá jén ɲwér-é.
 7.black 7.CONN hen 7.AGR-PST1-may search owner-Q
 ‘May the black hen look for its owner?’ all H tones
- (42) tòlò à-jè ɲgì d́ám-é.
 1.mouse 1.AGR-be.PRES no problem-Q
 ‘Does the mouse have no problem?’ all L tones

The pitch tracks of sentences (41) and (42) are shown in Fig. 5 and 6. In *yes-no* questions, there is a small difference between the male speaker and the female speaker. The male speaker has a f_0 plateau, similar to declarative sentences, shown in H tone and L tone contexts, as in Fig. 5a and 5b. **The female speaker, however, begins with a raised f_0 and shows gradual f_0 declination as in Fig. 6a and 6b.**

¹⁰ A reviewer wondered whether the underlying tone of the Q morpheme could be a L tone. Such an analysis predicts that the surface tone of the Q morpheme should be a falling tone in (39)b to (41), which is not the case.

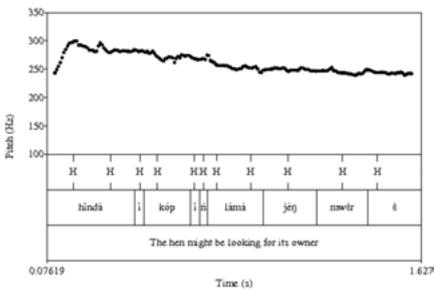


(a) *Yes-no* question – High tones only

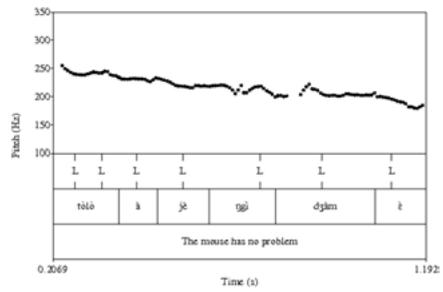


(b) *Yes-no* question – Low tones only

Figure 5: *Yes-no* question – Male speaker



(a) *Yes-no* question – High tones only



(b) *Yes-no* question – Low tones only

Figure 6: *Yes-no* question – Female speaker

What we can conclude so far is that tonal specifications are not affected by sentence modality and that there is no systematic initial or final tonal rising or lowering that would be indicative of the presence of modality-related boundary tones. A more systematic study is however needed to confirm this observation and to determine whether there are more subtle but nonetheless systematic prosodic differences between declaratives and their corresponding *yes-no* questions (e.g. expansion of the overall pitch range or downdrift manipulations). As suggested by Makasso (2012), creaky termination (low f_0 , aperiodic glottal pulses and lower amplitude) might ultimately be found and lead to the classification of Bàsàá into the languages described by Rialland (2009) as displaying a lax question prosody.

Let us now turn to the final section of this chapter, which examines the influence of focus and discourse-givenness on Bàsàá tones.

4 Tone and discourse context

In intonation languages such as Germanic or Romance languages, information-structural notions such as focus and discourse-givenness have been shown to affect prosodic prominence. Despite a number of differences between these languages families, focused information tends to present a prominence boost, while discourse-given information is prosodically reduced (a.o. Cruttenden, 1993; Swerts et al., 2002; Ladd, 2008; Breen et al., 2010). Although it is commonly assumed that tonal languages do not exploit prosody as much as intonation languages do in expressing information-structural categories, a growing number of (sometimes complex) tonal languages have been shown to utilize prosodic cues to encode focus. Xu (1999) and Jannedy (2007) have shown that in Mandarin Chinese and Northern Vietnamese, respectively, focus and post-focal givenness have an effect on pitch range. In African tonal languages too, prosody has been shown to correlate with information structural status, even if in some cases prosodic focus marking is only optional and rather secondary (a.o. Fiedler and Jannedy (2013) on Ewe, or Kügler, this volume, on Akan). In Bantu languages such as Chichewa (Kanerva, 1990) and Xhosa (Zerbian, 2004), it has been argued that focus triggers the insertion of additional prosodic boundaries, which correlate for instance with the presence of penultimate vowel lengthening of the focused phrase (see for instance Patin, this volume, on Shingazidja). Recently, the systematic influence of focus on the prosody of Bantu languages has however been questioned, as no or only optional prosodic cues could be found in languages such as Northern Sotho (Zerbian, 2006) and Chichewa (Downing and Pompino-Marschall (2013), Downing, this volume).

In Bàsàá, the tone-sandhi rules discussed in Section 2.2 remain unaffected by information structure, suggesting that focus is not encoded by means of changes in the prosodic structure (i.e. by insertion or deletion of phrasal boundaries). The question we address in this section is whether Bàsàá nonetheless prosodically encodes information-status. The results of our production study suggest that f_0 , duration and intensity are not reliable indicators of information-structural status.

4.1 Methodology

Focus is expressed either *in situ* or by means of inverted pseudo-clefts (Hamlaoui and Makasso, 2015) in Bàsàá. To determine whether focus affects prosodic prominence, we elicited 10 simple transitive sentences in which word order was kept constant. For each sentence, a context was set by means of a *wh*-question, so as

to elicit focus either on the entire sentence (baseline condition), on the object constituent, on the subject constituent or on a locative or temporal adjunct. A sample paradigm is given in (43) to (46).

(43) All-new

A: kí í-ŋ-↓únbáhá nílóm?
 7.what 7.AGR-PRES-upset.CAUS 1.husband
 ‘What upsets the husband?’

B: jàŋgó à-βí-nùŋúl móó í bòm.
 1.wife 1.AGR-PST2-sell 6.oil LOC 7.market
 ‘[The wife sold the oil at the market]_{FOCUS}’

(44) Object focus

A: jàŋgó à-βí-nùŋúl kí í bòm?
 1.wife 1.AGR-PST2-sell 7.what LOC 7.market
 ‘What did the wife sell at the market?’

B: jàŋgó à-βí-nùŋúl móó í bòm.
 1.wife 1.AGR-PST2-sell 6.oil LOC 7.market
 ‘The wife sold [the oil]_{FOCUS} at the market’

(45) Subject focus

A: ndžé à-βí-nùŋúl móó í bòm?
 1.who 1.AGR-PST2-sell 6.oil LOC 7.market
 ‘Who sold the oil at the market?’

B: jàŋgó à-βí-nùŋúl móó í bòm.
 1.wife 1.AGR-PST2-sell 6.oil LOC 7.market
 ‘[The wife]_{FOCUS} sold the oil at the market’

(46) Adjunct focus

A: jàŋgó à-βí-nùŋúl hé móó?
 1.wife 1.AGR-PST2-sell where 6.oil
 ‘Where did the wife sell the oil?’

B: jàŋgó à-βí-nùŋúl móó í bòm.
 1.wife 1.AGR-PST2-sell 6.oil LOC 7.market
 ‘The wife sold the oil [at the market]_{FOCUS}’

The tonal make-up of the sentences was as varied as possible, as we did not expect focus to affect only some tones. We also varied the length of the words and the constituents, for more naturalness (see Appendix for a full set of sentences).

Three participants (1 male and 2 female) took part in this production study. Each pair of a context question and a target response was presented on a computer screen in a randomized manner in a quiet room. Context questions were pre-recorded. Participants were instructed to first push a key to hear the context question, read the target sentence silently and then pronounce it as naturally as possible. Each sentence was repeated three times, yielding a total of 360 utterances (3 speakers * 10 items * 4 contexts * 3 repetitions).

A segment-by-segment and phrase-by-phrase alignment of the data was created using the Prosodylab Aligner (Gorman et al., 2011), trained on our own experimental data. We here report two types of measures. We first report phrasal measurements, for which we looked at the entire phrase (including both vocalic and consonantic segments). Additionally, we also examined particular vowels, which in Bàsàá can be considered to be part of the prosodic head of a word, as they belong to the first syllable of the prosodic stem (root + suffixes) (Hyman, 2003). Whenever a subject, an object or an adjunct was phrasal, the examined vowel is the one pertaining to the syntactic head of this phrase (see underlined vowels in the Appendix). Measures of maximum f_0 , maximum intensity and duration were obtained for each head vowel and each phrase using PRAAT scripts (Boersma and Weenink, 2014).¹¹ All statistical analyses were conducted in the R environment software (R Core Team (2015), version 3.2.2). Linear mixed effects models were used to analyze the data, with random intercepts and slopes for items and participants.

4.2 Results

4.2.1 Fundamental frequency

Stylized f_0 contours for each item are given in Fig. 7 and 8. For both vowels and phrases, absolute and relative pitch (using difference in semitones between Subject and Verb, Verb and Object and Object and Adjunct, respectively) were examined. None of the comparisons turned out to be significant, indicating that focus does not affect pitch in Bàsàá.

¹¹ Many thanks go to Michael Wagner and the McGill ProsodyLab for sharing with us their tools for data analysis, and to Jonas Engelmann for assistance in the processing and the statistical analysis of the data.

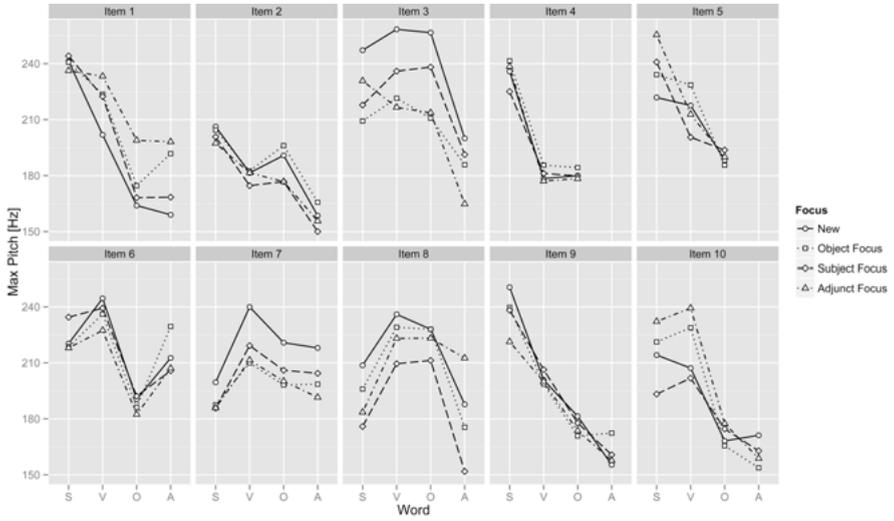


Figure 7: Focus: mean maximum f_0 in phrases (3 speakers * 3 repetitions)

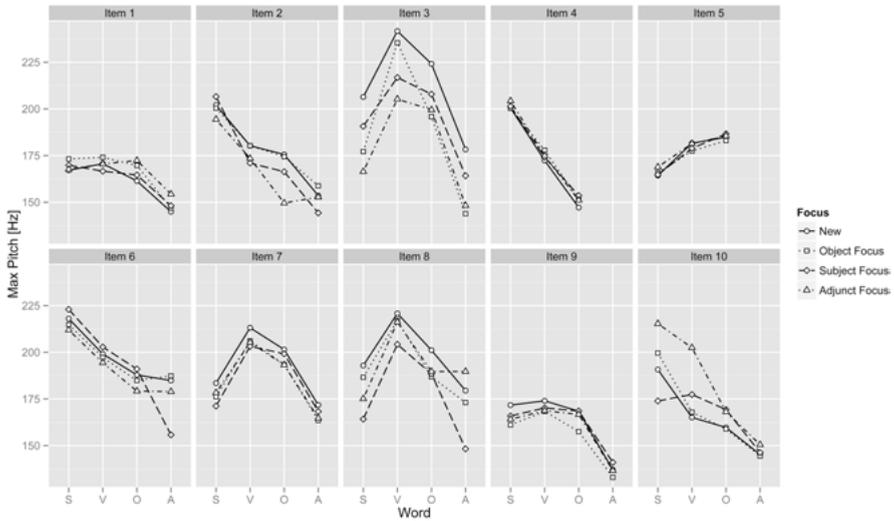


Figure 8: Focus: mean maximum f_0 for head vowels (3 speakers * 3 repetitions)

Bāsàà thus does not pertain to tone languages in which focus participates in determining the fundamental frequency of tones.

4.2.2 Duration

Measures of duration for the target phrases and their head vowels are given in Fig. 9 and 10, respectively. We examined absolute and relative duration (using difference in log duration between Subject and Verb, Verb and Object and Object and Adjunct, respectively).

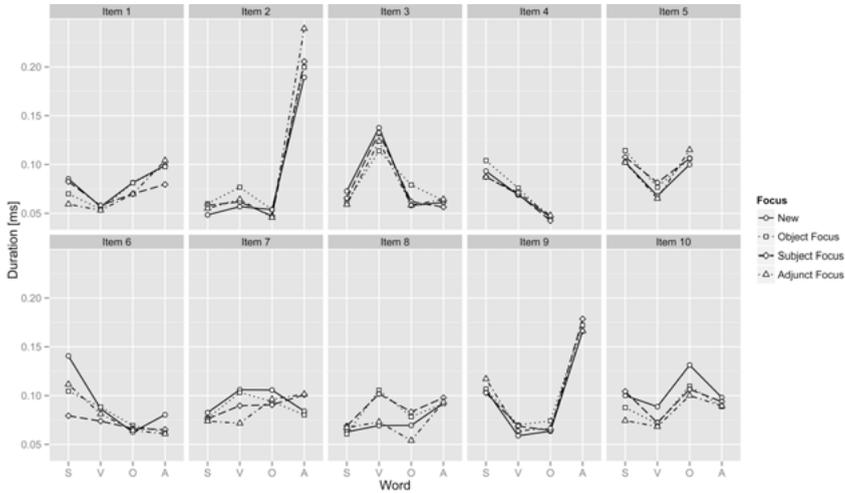


Figure 9: Focus: mean duration for phrases (3 speakers * 3 repetitions)

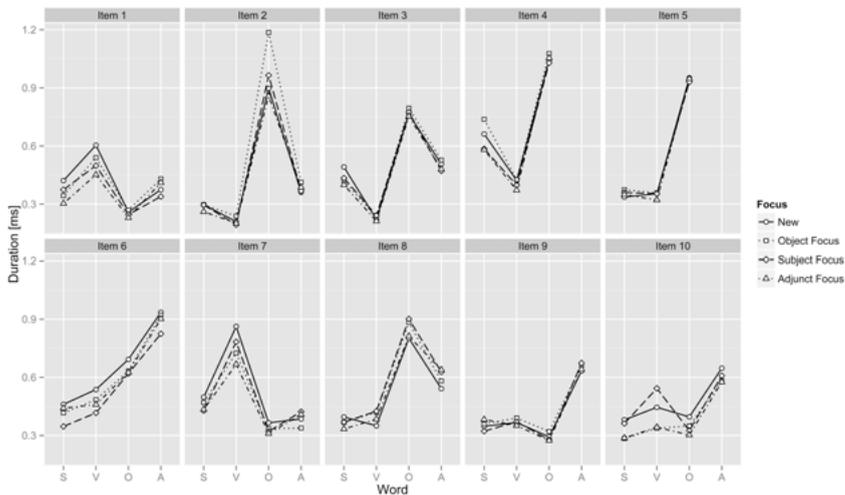


Figure 10: Focus: mean duration for head vowels (3 speakers * 3 repetitions)

Neither the duration of the entire phrase, nor the duration of the head vowel was found to distinguish focused constituents from the non-focused ones. Duration is thus not a reliable cue to distinguish between focused and non-focused constituents in Bàsàà.

4.2.3 Intensity

Finally, measures of intensity for focused phrases and their head vowels are shown in Fig. 11 and 12, respectively. We proceeded to the examination of both absolute and relative intensity (using the difference in decibels between Subject and Verb, Verb and Object and Object and Adjunct, respectively). Once again, none of the comparisons turned out to be significant, indicating that intensity does not reliably encode information structure in Bàsàà.

In sum, what we observe is that Bàsàà is comparable to Bantu languages such as Northern Sotho (Zerbian, 2007), or other African languages like Buli (and other Gur relatives) (Schwarz, 2009) or Hausa (and other Chadic relatives) (Hartmann and Zimmermann, 2007) in that it presents no evidence of prosodic focus marking.

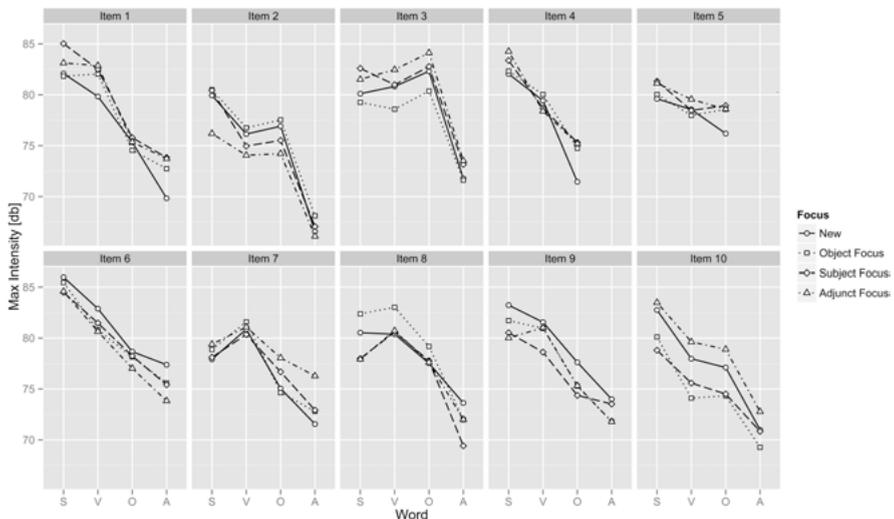


Figure 11: Focus: mean maximum intensity for phrases (3 speakers * 3 repetitions)

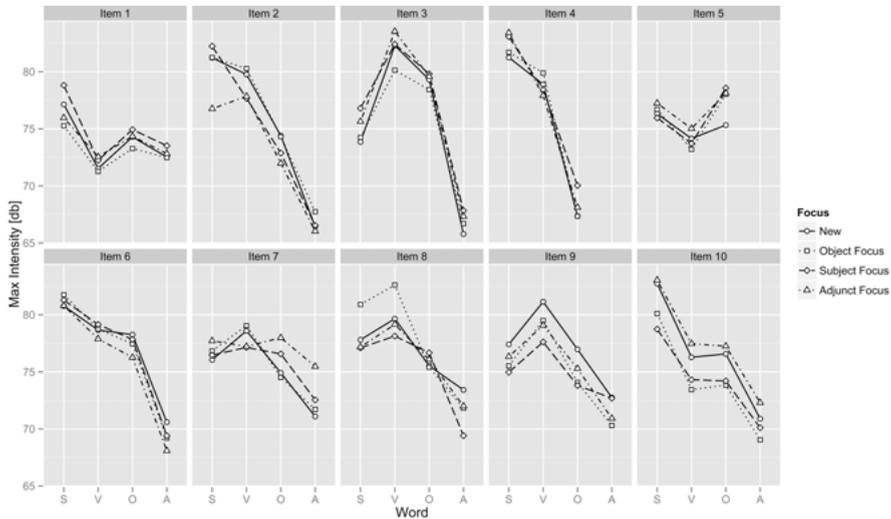


Figure 12: Focus: mean maximum intensity for head vowels (3 speakers * 3 repetitions)

5 Conclusion

Two major aspects of the intonational phonology of Bāsàá, a Bantu language with an underlying opposition between high, low and toneless TBUs, have been reported in this chapter. First, Bāsàá has two major tone rules (high tone spreading and falling tone simplification) that show sensitivities to prosodic domains. HTS applies within a phonological phrase, but not across right phonological phrase boundaries. FTS, on the other hand, applies within an intonational phrase and fails to apply across left intonational phrase boundaries. The other intonational aspect of Bāsàá is that tones do not seem to be affected by sentence modalities or information structure. Declaratives and *yes-no* questions show nearly identical intonation patterns. Finally, varying the location of focus in a sentence does not affect sentence prosody in any significant way either. Other structures will have to be studied to determine whether there is intonational structure to speak of in the grammar of Bāsàá.

Acknowledgement

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Appendix

Underlined vowels in the examples are head vowels that are measured in the analysis in section 4.

- Item 1 nàṅgó à-βí-nùṅúl m-óó í ɓòm.
1.wife 1.AGR-PST2-sell 6.oil LOC 7.market
'The wife sold the oil at the market.'
- Item 2 lí-wáṅdá lí málêr lí-ṅ-wáṅ má-kàlà má
5.friend 5.CONN 1.teacher 5.AGR-PST1-fry 6.doughnut 6.CONN
m-bòṅ ɗ-ù.
3.cassava 5.night
'The teacher's friend fried cassava doughnuts last night.'
- Item 3 rì-nùṅí rí-ṅ-ṅ m-ú[↓]mbúl mà-láám í pùmá.
13-birds 13.AGR-PST1-build 6.nests 6.beautiful LOC 1.orange.tree
'The birds built beautiful nests on the orange tree.'
- Item 4 í-ḅ-ṅṅé ɓáná ɓá-m-ḅárá m-áṅòlò má ɓ-á[↓]sáṅ.
AUG-2-children 2-DEM 2.AGR-PST1-pick.up 6-mangoes CONN 2.fathers
'These children have picked up the mangoes of the fathers.'
- Item 5 m-àṅé à-n-níp ṅ-hóólàk lí-kòndò.
1-child 1.AGR-PST1-steal 3.ripe 3.CONN.5.plantain
'The child stole the ripe plantain.'
- Item 6 lí-húá lí-βí-[↓]nól ṅándàk á-òr í ṅwí ú-β-í[↓]táyɓè.
5.alcohol 5.AGR-PST2-kill many 2-people 3.DEM 3.year 3.AGR-PST2-pass.
'Alcohol killed a lot of people last year.'
- Item 7 hì-ṅṅndà hí-ṅ-hójá sòmb ílámb í ɓòm.
19.girl 19.AGR-PST1-forget buy 3.meat LOC 7.market
'The girl forgot to buy the meat at the market.'
- Item 8 ɓì-lò ɓì-ṅ-ḅé hí-òndè hó-só[↓]ná ɓì-kékèlà.
8-ducks 8.AGR-PST1-eat 19-peanut 19.PRO-all 8-morning
'The ducks ate all the peanuts this morning.'
- Item 9 m-àṅé à-ḅárá lò ɓèéhé.
1-child 1.AGR-PST3.pick.up 7.duck a.long.time.ago
'The child picked up the duck a long time ago.'
- Item 10 ɓólí í-ṅ-ṅ m-áṅé ɓì-kékèlà.
7.wasp 7.AGR-PST1-chase 1.child 8-morning
'The wasp chased the child this morning.'

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