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Lusoga Noun Phrase Tonology

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1. Introduction

Bantu tone systems have long been known for their syntagmatic properties, including the ability of a tone to assimilate or shift over long distances. Most systems have a surface binary contrast between H(igh) and L(ow) tone, some also a downstepped H which produces a contrast between H-H and H-⁺H.¹ Given their considerable complexity, much research has focused on the tonal alternations that are produced both lexically and post-lexically. Lusoga, the language under examination in this study, is no exception. Although the closest relative to Luganda, whose tone system has been widely studied (see references in Hyman & Katamba 2010), the only two discussions of Lusoga tonology that I am aware of are Yukawa (2000) and van der Wal (2004:20-30), who outline the surface tone patterns of words in isolation, including certain verb tenses, and illustrate some of the alternations. The latter also points out certain resemblances with Luganda: “Two similarities between Luganda and Lusoga are the clear restriction against LH syllables and the maximum of one H to L pitch drop per word” (van der Wal 2004:29). In this paper I extend the tonal description, with particular attention on the relation between underlying and surface tonal representations. As I have pointed out in a number of studies, two-height tone systems are subject to more than one interpretation: First, the contrast may be either equipotent, H vs. L, or privative H vs. \emptyset or L vs. \emptyset , or both, H vs. L vs. \emptyset . Second, the representations may diverge at different levels of representation. For example, Hyman & Katamba (2010:70) suggest that Luganda has an underlying privative contrast between /H/ and \emptyset , an intermediate ternary contrast between H, L and \emptyset , and a surface binary contrast between H and L (with a marginal downstepped ⁺H). In the following sections I will show that such an analysis is not optimal for Lusoga. Starting with a diachronically faithful /H/ vs. \emptyset analysis of verb infinitive tones in §2, I will then argue for a synchronic reanalysis in §3 whereby /H/ tones have been restructured as /L/ preceded by an unlinked H tone. This is followed by a discussion of noun tones in §4 and noun modifiers in §5. (A study of verb tonology is in progress, while Hyman 2016 provides an overview of clause level tonology.) While similarities with Luganda will be evident in a number of ways, the differences are equally impressive. I will thus conclude in §6 with a summary comparison of the tonal properties of Luganda, Lusoga and Lulamogi, another closely related language spoken in the area.²

¹ A subset of these languages also allow the H and L tones to combine to produce HL falling and (more rarely) LH rising tones, which are frequently restricted to bimoraic (long vowel) syllables and/or by position within a word or phrase, e.g. the penult.

² The term Lusoga refers to several different Bantu speech varieties spoken in Busoga sub-region including sometimes Lulamogi, which should instead be recognized as dialectal with Lugwere JE17 (Hyman 2014, Hyman & Merrill 2016). The current study focuses on Lutenga, the standard Lusoga dialect, which has been the subject of considerable recent work, especially lexicographic (Gulere 2009, Nabirye 2009). Although I have relied on these resources for confirmation, the data presented in study is based on the speech of Fr. Fred Jenga, a native of Wairaka (Jinga District).

2. Infinitive tones: a diachronic analysis

In this section we begin by considering the tones on affirmative infinitives, as these reveal the major properties of the tone system in a rather straightforward way. Since there are several ways to interpret Lusoga tone synchronically, the discussion in this section will account for the data in terms of the historical tonal changes that have taken place since pre-Proto-Luganda-Lusoga. I will therefore start with a synchronic analysis of /H/ vs. Ø which corresponds to Proto-Bantu *H and *L, after which a different analysis will be proposed in §3.

As seen in the two tone patterns in (1), Lusoga is like most Bantu languages in distinguishing two tone patterns in infinitives. As indicated, these correspond to whether the root had *L or *H tone in Proto-Bantu.³

| (1) | *L root | | *H root | |
|-----|-----------------------|-----------------------|------------------------------|------------------------|
| 1σ | ò-kú-gw-á | ‘to fall’ | ò-kú-ty-à | ‘to fear’ |
| | ò-kú-mw-á | ‘to shave’ | ò-kú-ly-à | ‘to eat’ |
| 2σ | ò-kú-bál-á | ‘to count’ | ò-kú-bòn-á | ‘to see’ |
| | ò-kú-lím-á | ‘to cultivate’ | ò-kú-kùb-á | ‘to beat’ |
| 3σ | ò-kú-lágír-á | ‘to command’ | ò-kú-ghùlìr-á | ‘to hear’ |
| | ò-kú-lúmúk-á | ‘to run away’ | ò-kú-sèkùl-á | ‘to pound’ |
| 4σ | ò-kú-súmúlúl-á | ‘to untie’ | ò-kú-kàlàkát-á | ‘to scrape’ |
| | ò-kú-kálírír-á | ‘to grill’ | ò-kú-fùkàmír-á | ‘to kneel’ |
| 5σ | ò-kú-lágír-ágán-á | ‘to command e.o.’ | ò-kú-ghùlìr-ágán-á | ‘to hear each other’ |
| | ò-kú-súmúlúl-ír-á | ‘to untie for (s.o.)’ | ò-kú-kàlàkát-ír-á | ‘to scrape for (s.o.)’ |
| | STEM = H ⁿ | | STEM = L((L)H ⁿ) | |

The forms in (1) are arranged by the number of syllables in the stem, which consists of a verb root, possibly extended by derivational suffixes such as *-agan-* ‘reciprocal’ and *-ir-* ‘applicative’, and an inflectional final vowel (FV), here /-a/. As seen, the infinitive is marked with a L tone vowel prefix *ò-* known as the “augment” in Bantu, followed by the H tone noun class 15 prefix *-kú-*. Both it and all subsequent tones are H in the left column (corresponding to Proto-Bantu *L verb roots). In the right column, the first stem syllable drops to L in all cases, and the FV *-á* will be H unless the stem is monosyllabic. The longer verbs require two L tone stem vowels before the remaining vowels are H. The forms in (2) whose first syllable has a long vowel (VV) show that the two L tone requirement is a property of moras, not syllables:

| | | | | | |
|-----|----|------------------|---------------------|------------------|---------------|
| (2) | 2σ | ò-kú-zíík-á | ‘to bury’ | ò-kú-lèèt-á | ‘to bring’ |
| | | ò-kú-túúnd-á | ‘to sell’ | ò-kú-tùùng-á | ‘to weave’ |
| | 3σ | ò-kú-súúbír-á | ‘to hope’ | ò-kú-fàànán-á | ‘to resemble’ |
| | | ò-kú-sííndík-á | ‘to push, send’ | ò-kú-tààmùl-á | ‘to walk’ |
| | 4σ | ò-kú-yáándúlúz-á | ‘to spread out’ | ò-kú-fùùdhúlúlá | ‘to spit out’ |
| | | ò-kú-dóóndólím-á | ‘to make idle talk’ | ò-kú-sààndúkúl-á | ‘to uncover’ |

³ In citing examples I write *ci* and *ji* (pronounced with alveopalatal affricates) to reflect the pronunciation of my language consultant, rather than *ki* and *gi*, as in Standard Lusoga orthography. When not preceded by *m*, *b* stands for [β] and *gh* for voiced velar [ɣ] varying with [w] and sometimes [w], while *th*, *dh*, *nh* are dental consonants which contrast with alveolar *t*, *d*, *n*.

We thus obtain forms such as *ò-kú-fààná-á* ‘to resemble’, rather than **ò-kú-fàànà-á*, where the two L tones would be counting syllables. However, if the first syllable is short and the second long, the whole of the second syllable (and hence three moras) will be affected:

| | | | | | |
|-----|----|-------------------------|----------------------|------------------------|----------------|
| (3) | 3σ | <i>ò-kú-támíír-á</i> | ‘to become drunk’ | <i>ò-kú-tègèèr-á</i> | ‘to know’ |
| | | <i>ò-kú-kólóót-á</i> | ‘to purr’ | <i>ò-kú-dàlàànd-á</i> | ‘to climb’ |
| | 4σ | <i>ò-kú-dóbóókán-á</i> | ‘to get spoiled’ | <i>ò-kú-sèrèèngétá</i> | ‘to roll down’ |
| | | <i>ò-kú-kólóót-ír-á</i> | ‘to purr for (s.o.)’ | <i>ò-kú-mèsùnkán-á</i> | ‘to be shiny’ |

This is because Lusoga does not allow LH rising tone syllables. Finally, note that when the verb root begins with a vowel, the *-kú-V-* sequence becomes *-kw-VV-*, with the /u/ gliding to [w] and the root-initial vowel undergoing compensatory lengthening, e.g. /o-ku-ey-a/ → *ò-kw-ééy-á* ‘to sweep’. As seen in the forms on the right in (4), where a HL falling tone results, the L of the bimoraic syllable counts in calculating one of the two L tone moras:

| | | | | | |
|-----|----|------------------------|---------------|-----------------------|-------------------|
| (4) | 2σ | <i>ò-kw-ééy-á</i> | ‘to sweep’ | <i>ò-kw-éèt-á</i> | ‘to call’ |
| | | <i>ò-kw-íídh-á</i> | ‘to come’ | <i>ò-kw-îît-á</i> | ‘to kill’ |
| | 3σ | <i>ò-kw-óógér-á</i> | ‘to speak’ | <i>ò-kw-îînik-á</i> | ‘to dip, immerse’ |
| | | <i>ò-kw-íígál-á</i> | ‘to close’ | <i>ò-kw-îîngír-á</i> | ‘to enter’ |
| | 4σ | <i>ò-kw-íídhúkír-á</i> | ‘to remember’ | <i>ò-kw-áàsímúl-á</i> | ‘to sneeze’ |
| | | <i>ò-kw-áásííkán-á</i> | ‘to scream’ | <i>ò-kw-ààgààná-á</i> | ‘to meet, find’ |

Having established these patterns, we now turn to their interpretation. First, we note that the LHⁿ pattern of *L verb infinitives is reminiscent of Luganda, which can also realize such infinitive as all L: *ò-kú-bál-á* ~ *ò-kù-bàl-à* ‘to count’. The normal analysis of Luganda is that these surface tones are due to initial %L and (optional) final H% boundary tones. We can assume the same here.⁴ Turning to the forms on the left, it is clear that the tone of the *H root is anticipated onto the infinitive prefix which may be analyzed as /L/ or toneless. Assuming the latter, a rule of H tone anticipation (HTA) will shift a H tone to the preceding mora. Thus, if the underlying representation of ‘to beat’ is /o-ku-kúb-a/ it will become *ò-kú-kub-á* by HTA (but see below). That the final H is due to a final H% boundary tone is also justified by the fact that the infinitives ending L are realized with level rather than low falling pitch, i.e. *ò-kú-ty-à*^o ‘to fear’, *ò-kú-lyà*^o ‘to eat’ (where L^o represents a level L tone).⁵ The historical underlying representations (URs) of infinitives are as shown in (5):

| | | | | | |
|-----|----|-------------------|------------|-------------------|-----------|
| (5) | | /Ø/ root | | /H/ root | |
| | 1σ | <i>ò-kú-gú-á</i> | ‘to fall’ | <i>ò-kú-tì-à</i> | ‘to fear’ |
| | | H H% | | H H H% | |
| | 2σ | <i>ò-kú-bál-á</i> | ‘to count’ | <i>ò-kú-bòn-á</i> | ‘to see’ |
| | | H H% | | H H H% | |

⁴ In contexts where the augment vowel is absent (e.g. following a negative verb), the infinitive prefix *ku-* takes the %L tone, e.g. *kù-gw-á* ‘to fall’, *kù-bál-á* ‘to count’, *kù-lágír-á* ‘to command’. The *H tone forms do not realize the %L since *kú-* carries a H tone (anticipated from the verb root): *kú-ty-à* ‘to fear’, *kú-bòn-á* ‘to see’, *kú-ghùlír-á* ‘to hear’.

⁵ The final H% boundary tone is not present in yes-no questions or imperative commands.

| | | | | |
|----|-------------------------|-------------------|----------------------|----------------------|
| 3σ | ò-kú-lágír-á | ‘to command’ | ò-kú-ghùlìr-á | ‘to hear’ |
| | H H% | | H H H% | |
| 4σ | ò-kú-súmúlúl-á | ‘to untie’ | ò-kú-kàlàkát-á | ‘to scrape’ |
| | H H% | | H H H% | ‘to kneel’ |
| 5σ | ò-kú-lágír-ágán-á | ‘to command e.o.’ | ò-kú-ghùlìr-ágán-á | ‘to hear each other’ |
| | H H% | | H H H% | |

As seen I have posited an underlying /H/ on the augment vowel /ó-/. I will return to this in a moment. First, however, note in the forms on the left that the final H% tone goes onto all of the preceding moras except the first. In the forms on the right, the H on the initial mora of the root shifts onto the toneless infinitive prefix /-ku-/. The boundary H% goes onto the final vowel unless the last two syllables of the word end H-L. In this case, H% stays out, but levels the final L to the non-falling L°: *ò-kú-ty-à°* ‘to fear’.⁶ Because this non-falling L° is predictable (e.g. it occurs at the end of a declarative, but not an interrogative sentence), it will not be transcribed except when it is under discussion.

The above analysis leaves two open questions. The first concerns the double L tone pattern that was mentioned: Whenever there is a H to L transition, the L is realized on two moras, unless it can’t be. There is a single L in *ò-kú-ty-à°* ‘to fear’ since there is only one post-H syllable, and in *ò-kú-kùb-á* ‘to beat’, since otherwise the H% boundary tone would not be realized. In other words, it is preferable to violate the H-L-L requirement than to leave the H% unassociated. But why should there be such a required L tone doubling rule, or OT-style double-L constraint, that produces forms like *ò-kú-ghùlìr-á* ‘to hear’ and *ò-kú-kàlàkát-á* ‘to scrape’ instead of **ò-kú-ghùlìr-á* and **ò-kú-kàlàkát-á*? The answer is historical. We can derive the correct output tones diachronically as in (6).

| | | | | | | | | | |
|-----|-----------------|---|----------------|---|----------------|---|------------------|---|------------------------|
| (6) | <i>stage 1</i> | | <i>stage 2</i> | | <i>stage 3</i> | | <i>stage 4</i> | | <i>stage 5</i> |
| a. | *ó-ku-bón-a | > | ò-ku-bón-a | > | ò-ku-bón-à | > | ò-kú-bòn-à | > | ò-kú-bòn-á |
| | H H | | L H | | L H L | | L H L L | | L H L H% |
| b. | *ó-ku-ghùlìr-a | > | ò-ku-ghùlìr-a | > | ò-ku-ghùlìr-a | > | ò-kú-ghùlìr-a | > | ò-kú-ghùlìr-á |
| | H H | | L H | | L H L | | L H L L | | L H L L %H |
| c. | *ó-ku-kálakat-a | > | ò-ku-kálakat-a | > | ò-ku-kàlàkat-a | > | ò-kú-kàlàkat-a | > | ò-kú-kàlàkát-á |
| | H H | | L H | | L H L | | L H L L | | L H L L %H |
| d. | *ó-ku-lim-a | > | ò-ku-lim-a | > | ò-ku-lim-a | > | ò-ku-lim-a | > | ò-kú-lím-á |
| | H | | L | | L | | L | | L H% |

At the initial stage 1, the augment /ó-/ is *H as is the first mora of the root in (6a-c). Other moras are phonologically toneless. In stage 2 the lowering of the augment *H to L is the first change I propose, since it characterizes most of the closely related languages as well. (I will later argue that the *H of the augment is actually deleted when not preceded by a proclitic.) This is followed in stage 3 by a rule of L tone insertion (LTI) after the last H of a word, a process well known from Luganda (Hyman & Katamba 2010:72). It is in stage 4 that Lusoga parts company with Luganda: H tones are anticipated onto the preceding mora, in this case the toneless infinitive prefix **-ku-*. As seen, I have indicated an overt L tone in its place, much as

⁶ While this might first appear to be an Obligatory Contour Principle effect prohibiting *H-H, it is more likely the result of a constraint against a phrase-final H-°H sequence, which may only surface medially.

Hyman & Valinande (1985) originally proposed as a “H tone trace” for Kinande.⁷ As seen, this produces the double L tone sequence that precedes the final H% boundary tone, which is assigned in stage 5 to all remaining toneless moras, counting from the end of the word (actually, the phrase).

Recall that the argument for early lowering of the augment H was that this is a very common change in Bantu languages in the interlacustrine area (but not in closely related Lulamogi). The derivations in (6) confirm this decision and provide a second reason that augment *H > L had to be the first change. Had augment *H > L occurred in stage 4, i.e. at the stage of general HTA, denecessitating stage 2, we would have expected the derivation of toneless root infinitives such as ‘to cultivate’ to begin with two L tones:

| | | | | | | | |
|-----|----------------|---|----------------|---|----------------|---|----------------|
| (7) | <i>stage 1</i> | > | <i>stage 3</i> | > | <i>stage 4</i> | > | <i>stage 5</i> |
| | *ó-ku-lim-a | | ó-kù-lim-a | | ò-kù-lim-a | | *ò-kù-lím-á |
| | H | | H L | | L L | | L L H% |

Intead, as seen in (6d) and previous examples, such infinitives (and other “toneless” words in the language) begin with a single L (cf. *ò-mú-límí* ‘farmer’).⁸

There is in fact clear synchronic evidence that the augment has an underlying /H/ which surfaces whenever there is a preceding toneless proclitic, such as /na/ ‘with, and’:

| | | | | | | | | | | | | | |
|-----|----|------|-------------|-------------|-----|------------|------------|-----|------------|------------|----|-------------|-------------|
| (8) | a. | /na= | ó-ku-lim-a/ | > | na= | ó-kù-lim-a | > | ná= | ò-kù-lim-a | > | n’ | òò-kù-lím-á | |
| | | | H | | | H L | | H | L L | | HL | L H% | |
| | | b. | /na= | ó-ku-bón-a/ | > | na= | ó-ku-bón-à | > | ná= | ò-kú-bòn-à | > | n’ | óó-kú-bòn-á |
| | | | H | H | | H | H L | | H | L H L L | | HH | H L H% |

In (8a) the /H/ of the augment is preserved after *na=* onto which it is anticipated. With vowel coalescence and final H% assignment, the output is *n’òò-kù-lím-á* ‘and to cultivate’. The augment /H/ is also preserved in (8b), where the root *-bón-* ‘see’ is also underlyingly /H/. After HTA, vowel coalescence, and H% assignment, we should but do not obtain an initial falling tone (**n’òò-kú-bòn-á*). Instead, the expected L on *n’òò-* is lost by a rule of H tone plateauing (HTP) by which a H-Lⁿ-H sequence becomes all H within a word. We thus obtain *n’óó-kú-bòn-á* ‘and to see’. As in Luganda, HTP is responsible for the generalization that there can only be one pitch drop from H to L in a Lusoga word.⁹ The corresponding forms without an augment confirm that /na/ does not have a H tone of its own: *nà= kú-bòn-á*, *nà= kù-lím-á*. We can thus firmly establish that the augment morpheme preserves evidence of its original *H in synchronic Lusoga.

To conclude this subsection we consider the realization of affirmative infinitives with an object marker (OM). Since all OMs have the same tone in Lusoga, it will suffice to illustrate the tone patterns with the same OM throughout, here *-tu-* ‘us’. As can be seen in (9), forms

⁷ Stage 4 likely represents a telescoping of involving an intermediate HL falling tone stage H-HL-L, as proposed for Ruwund (Nash 1992-4), a language which has inverted the original Bantu tones.

⁸ Synchronically, one could still formulate the double-L constraint to be in effect only when there is a preceding H in the output, as when the augment *H is saved by a preceding enclitic in (8a).

⁹ HTP must of course apply before the assignment of the phrasal H% boundary tone or we would obtain **n’óó-kú-bón-á* instead of the correct *n’óó-kú-bòn-á*. Since HTP is a word-level rule and H% is not assigned until the phrasal phonology, this is not a problem. Both HTP and H% are also found in Luganda, although with differences.

containing either a *L or *H root show the same tones: The OM is L, as is the first mora of verb stems of two or more syllables. (Monosyllabic stems take the H% boundary tone.) In other words, the OM+first syllable of the verb stem have the same tonal patterns as the *H verb forms without an OM—although realized one syllable to the left: Whereas the forms in (1b) begin with two stem L tones, those in (9) have a L OM followed by one L stem mora.

| (9) | *L root | | *H root | |
|-----|----------------------|-------------------|----------------------|--------------------|
| 1σ | ò-kú-tù-mwá | ‘to shave us’ | ò-kú-tù-ty-á | ‘to fear us’ |
| 2σ | ò-kú-tù-bàl-á | ‘to count us’ | ò-kú-tù-bòn-á | ‘to see us’ |
| 3σ | ò-kú-tù-làgír-á | ‘to command us’ | ò-kú-tù-ghùlír-á | ‘to hear us’ |
| 4σ | ò-kú-tù-sùmúlúl-á | ‘to untie us’ | ò-kú-tù-kàlákát-á | ‘to scrape us’ |
| 5σ | ò-kú-tù-sùmúlúl-ír-á | ‘to untie for us’ | ò-kú-tù-kàlákát-ír-á | ‘to scrape for us’ |

To account for the H on the prefix *-ku-*, the OM has to have been *H in the infinitive. In the following derivations I start with stage 2, i.e. where the augment *H has already become L.

| | | | | | | | |
|---------|------------------|---|------------------|---|-----------------|---|------------------|
| (10) a. | ò-ku-tú-lagir-a | > | | > | ò-ku-tú-làgír-a | > | ò-kú-tù-làgír-á |
| | L H | | | | L H L | | L H L L H% |
| b. | ò-ku-tú-ghúlír-a | > | ò-ku-tú-ghùlír-a | > | | > | ò-kú-tù-ghùlír-á |
| | L H H | | L H L | | | | L H L L H% |

In the case of the *L root form in (10a), the derivation is straightforward: LTI inserts a L after the H of the OM *-tú-* ‘us’, whose H is then anticipated onto the infinitive prefix *-ku-*. This produces a double L sequence, allowing the H% boundary tone to link to the final two toneless moras of the word. The derivation in (10b) is similar, the main difference being in the change of a contiguous sequence of H tones to H + L. Known as Meeussen’s Rule (MR), a change of H-H to H-L attributable to the Obligatory Contour Principle (OCP) is quite common in Eastern Bantu languages. As in Luganda, MR must precede LTI, or else the wrong output with two many Ls will obtain, as in (11).

| | | | | | | | |
|------|------------------|---|------------------|---|------------------|---|-------------------|
| (11) | o-ku-tú-ghúlír-a | > | ò-ku-tú-ghúlír-a | > | ò-kú-tù-ghùlír-a | > | *ò-kú-tù-ghùlír-á |
| | L H H | | L H HL | | L H L LL | | L H L L LH% |

Since MR produces H-L sequences, it bleeds LTI, which will apply only after the last H of a word that is not followed by L.

However, when we turn to consider forms with two (ultimately three) OMs, a problem arises:

| | | | | |
|---------|------------------------|---|------------------------|----------------------------|
| (12) a. | ò-ku-cí-tú-bal-ir-a | > | ò-kú-cì-tù-bàl-ír-á | ‘to count it for us’ |
| | L H H | | L H L L L | H% |
| b. | o-ku-cí-tú-kúb-ir-a | > | ò-kú-cì-tù-kùb-ír-á | ‘to beat it for us’ |
| | L H H H | | L H L L L | H% |
| c. | o-ku-cí-mú-tú-ghá-er-a | > | ò-kú-cì-mù-tù-ghè-èr-á | ‘to give it to him for us’ |
| | L H H H H | | L H L L L | L H% |

The forms with a *H verb root in (12b,c) work by the rules discussed above: In each case MR applies to all but the first of a sequence of H tones. Thus, H-H-H becomes H-L-L in (12b) and H-H-H-H becomes H-L-L-L in (12c). Since MR has created these Ls, LTI does not apply. The problem, however, is why the toneless verb root /-bal-/ ‘count’ has a L tone in (12a). According to what we have seen above, the application of MR that changes -*ci-tú-* to -*ci-tù-* should have bled LTI. This unexpected L is found only on the root-initial mora. One ad hoc move would be to assume an early copying of the H of an OM onto the first mora of a *L verb root, thereby merging it with *H roots. Both would then correctly undergo MR. Another alternative is to recognize an internal structure to the infinitive (and perhaps other verb forms). The OM + stem constituent is known in Bantu as the macro-stem and excludes any earlier prefixes, including other OMs. In order to avoid the incorrect output seen above in (11), LTI must not be operative within the stem level phonology, but rather comes into play at the macro-stem and word levels. As seen in (13), a cyclic analysis produces the correct outputs in (12a,b):

| | | | | |
|---------|--------------------------|---|-------------------------|---|
| (13) a. | <i>cycle 1:</i> (LTI) | [tu- [bal-ir-a]] H Ø ↓ L | <i>cycle 1:</i> (MR) | [tu- [kub-ir-a]] H H ↓ L |
| b. | <i>cycle 2:</i> (MR) | [ci- [tu- bal-ir-a]] H H L ↓ L | <i>cycle 2:</i> (MR) | [ci- [tu- kub-ir-a]] H H L ↓ L |

As indicated, both LTI and MR apply in the first cycle, but MR must apply first (or, again, we will derive the incorrect output in (11)). Whether this solution turns out to be correct or not, it is important to note that this happens only in the affirmative infinitive. In other parts of the paradigm, a single, pre-stem OM is toneless, including negative infinitives (cf. §6). Before moving on to propose a restructured analysis of the Lusoga tonal system, I present a table of the personal OMs to show that they all do show the same tones independent of whether their shape is CV-, N- or V-:¹⁰

| | | | |
|-------------|-----------------|------------------|-------------------------------------|
| (14) | *L root | *H root | |
| <i>1sg</i> | ò-kùù-n-dàgír-á | ò-kùù-m-pùlír-á | ‘to command/hear me’ |
| <i>2sg</i> | ò-kú-kù-làgír-á | ò-kú-kù-ghùlír-à | ‘to command/hear you sg.’ |
| <i>3sg</i> | ò-kú-mù-làgír-á | ò-kú-mù-ghùlír-á | ‘to command/hear him/her’ |
| <i>1pl</i> | ò-kú-tù-làgír-á | ò-kú-tù-ghùlír-á | ‘to command/hear us’ |
| <i>2pl</i> | ò-kú-bà-làgír-á | ò-kú-bà-ghùlír-á | ‘to command/hear you pl.’ |
| <i>3pl</i> | ò-kú-bà-làgír-á | ò-kú-bà-ghùlír-á | ‘to command/hear them’ |
| <i>refl</i> | ò-kw-èè-làgír-á | ò-kw-èè-ghùlír-á | ‘to command/hear oneself/oneselves’ |

At this point it is important to evaluate the above analysis and, as I shall now suggest, adopt another.

3. Infinitive tones: a synchronic reanalysis

¹⁰ As seen in the examples, the class 2 OM -*ba-* ‘them’ is used also with the meaning ‘you plural’.

In the preceding section we started with an underlying contrast between /H/ and Ø and introduced L tones in the course of the derivation. These were seen to originate from four distinct sources:

- (15) a. augment lowering: H → L on a vowel at the left edge of a clitic group
 b. Meeussen's Rule (MR): H-H → H-L
 c. L tone insertion (LTI): insert a following L if the last tone of a word is H
 d. H tone anticipation (HTA): shift the H to the preceding mora; leave a L tone on a mora whose H has been anticipated
 e. %L boundary tone: assign an initial %L boundary tone

In contrast, the rules involving the introduction of more H tones were HTP and the assignment of the final H% boundary tone which links which changes final L-L to L-H and links to a word-final sequence of toneless moras. (Although not discussed here, Hs are also anticipated from one word to another.) The question is whether we should not have considered starting with underlying /L/. In (16) I enumerate several of the possible underlying analyses of a two-height tone system, illustrated on the last three syllables of *kù-bál-á* 'to count' and *kú-bòn-á* 'to see', as they are pronounced without an augment:¹¹

- (16) a. /H/ vs. Ø : /ku-bal-a/ /ku-bón-a/
 b. /H/ vs. /L/ : /kù-bàl-à/ /kù-bón-à/
 c. /L/ vs. Ø : /ku-bal-a/ /ku-bòn-a/
 d. /H/ vs. /L/ : /kú-bál-á/ /kú-bòn-á/

(16a) is the privative analysis considered in §2. (16b) differs only in proposing non-H moras are /L/ instead of toneless. Both (16a) and (16b) correspond to the historical tones, the choice being whether one thinks Proto-Bantu had a privative system (Stevick 1969) or an equipollent one (Greenberg 1948).¹² In contrast, the two analyses in (16c) and (16d) represent restructurings of the inherited system: (16c) assumes a privative contrast with /L/ as the marked tone, while (16d) keeps an equipollent contrast, but with the historical tones inverted. Either analysis would of course greatly affect the way that the rules in (15) are expressed. Thus, if /L, Ø/ were postulated as in (16c), we would need to reinterpret the above rules as follows:

- (17) a. augment lowering: the augment would be underlyingly /L/
 b. Meeussen's Rule (MR): a sequence of /L/'s stays L (preceded by a H tone)
 c. L tone insertion (LTI): if the last /L/ of a word is preceded by Ø, spread it onto the next mora (or: insert a L if an OCP violation is tolerated)

¹¹ I leave out consideration a system of /H/ vs. /L/ vs. Ø with a ternary contrast.

¹² Since both /H, L/ and /H, Ø/ Bantu languages are attested today, the question is whether the original system treated the tones as relatively symmetric, both active in the phonology, or whether the non-H tone was inactive, presumably receiving default L pitch. Discussion of this would take us quite far afield from the intention of this paper.

- d. H tone anticipation (HTA): insert a H tone on a toneless TBU that precedes a L or sequence of Ls; spread this H to any preceding toneless moras
- e. %L boundary tone: assign an initial %L boundary tone

As seen, only (17e) stays the same. While (17c) seems reasonable, (17b) is particularly interesting as MR would essentially become unnecessary: (17d) would assign a H to the TBU that precedes the sequence of Ls, just as it would do before a single L. The result is thus surprisingly efficient—in fact, one could argue superior to the /H, Ø/ analysis. The equipollent /H, L/ analysis in (16b) would have to change a lot of /L/'s to H, rather than filling in blanks, thereby not directly representing any putative asymmetry in markedness between the two tones. Finally, if adopting the analysis in (16d), the same /H, L/ contrast could be assigned in an “inverted” fashion: Historical *L is now /H/, and historical *H is now /L/. In this sense (16a,b), both mirror the historical values more faithfully than (16c,d), which have inverted *H to L. In each pair the difference is how the non-H tone of Proto-Bantu is treated, either with a tone, or as Ø.

The problem with the more historically direct analyses in (16a,b) is that a L tone trace has to mysteriously be left in the place of a /H/ tone that is anticipated onto the preceding TBU. What would be advantageous is an analysis that represents the marked tone as having both a H and L component. One possibility in (18a) is to recognize the *H tone as a /HL/ contour and the unmarked tone as either Ø or as /L/.

- (18) a. $\begin{array}{c} \mu \\ \wedge \\ H \ L \end{array}$ b. $\begin{array}{c} \mu \\ | \\ H \ L \end{array}$ c. $\begin{array}{c} \mu \\ | \\ H \ L \end{array}$

This approach was adopted for Luganda by Hyman & Katamba (1993a) and more recently by Jones (2015) for Luganda, Kinande, and Shi. However, it is not necessary to assume that both tones are underlyingly linked. In the representation in (18b), a linked H is followed by an unlinked L, while in (18c) a linked L is preceded by an unlinked H. In order to get the tonal anticipation of PB *H onto the preceding mora in Lusoga, the following would be needed, assuming that the preceding mora is toneless:

- (19) a. if (18a), the H of the linked HL would delink from its sponsoring mora and relink to the preceding mora
- b. if (18b), the unlinked L would link to the mora and delink the H from its sponsoring mora, which would then relink to the preceding mora
- c. if (18c), the unlinked H would link to the preceding mora

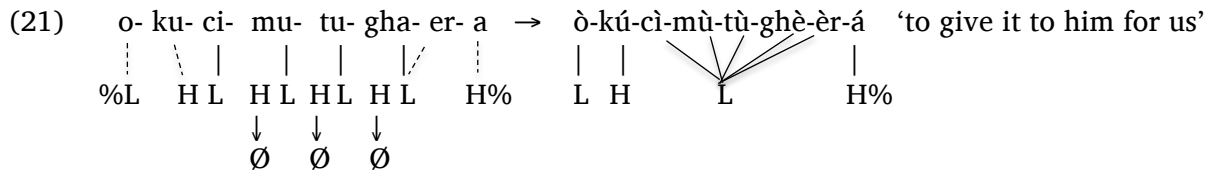
As seen, (19c) appears to be the simplest analysis.¹³ It is therefore appropriate to consider how the rules that would be required compare to those in the /H, Ø/ and /L, Ø/ analyses, as in (20).

¹³ All three analyses would require a L doubling rule, so this does not distinguish between them. The resulting solution in (19c) resembles the one proposed by Goldsmith (1984) for Tonga, although without the use of asterisk notation. It could presumably be appropriately applied to other Bantu systems with historical H tone anticipation, e.g. Kinande (Mutaka 1994, Jones 2016), Tembo (Kaji 1996) and Totela (Crane 2014).

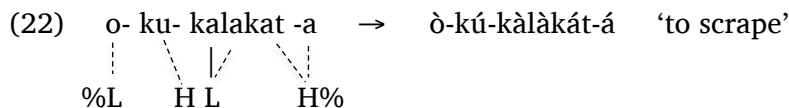
- (20) a. augment lowering: H → ∅ at the left edge of a clitic group
 b. Meeussen’s Rule (MR): unlinked H → ∅ between two linked Ls (which perhaps “fuse” if the OCP must be obeyed)
 c. L tone insertion (LTI): if the last /L/ of a word is preceded by ∅, spread it onto the next mora (or: insert a L if an OCP violation is tolerated)
 d. H tone anticipation (HTA): link an unlinked H to the preceding mora
 e. %L boundary tone: assign an initial %L boundary tone

Although I continue to express each process as a rule, recall that the input-output relations could be derived by ranking of appropriate constraints. In (20a) augment lowering is indicated as the deletion of its unlinked H. The reason for this is that unlike other would-be initial /^HL/ prefixes, e.g. most subject prefixes, the unlinked H (indicated by ^H) is never anticipated onto a preceding word, e.g. *ò-kú-bòh-à ò-mú-límí* ‘to see a farmer’, where the verb ‘to see’ ends L-L.¹⁴ Thus, the initial unlinked H of the augment would have to be deleted to avoid being assigned to the FV -á of the infinitive. Since H% works differently (see (23a)), as well as word-initial subject markers (cf. note 15), the most direct analysis, which I shall adopt, is to recognize two tonal allomorphs of the augment morpheme: ∅ if word initial, /^HL/ or /L/ if preceded by a proclitic, the choice depending on which analysis is adopted.¹⁵

To make this choice, consider what happens if the H of /^HL/ attempts to be anticipated onto a mora that itself has a L, i.e. in the MR context. As schematized in (21), MR would have to be expressed as the deletion of any unlinked H between linked Ls:



As a result of MR, only the unlinked H of the first OM /-‘cì-/ ‘it’ (class 7) is able to associate to the preceding mora, here the toneless infinitive prefix /-ku-/. Also shown in (21) is the spreading of the last L on to the toneless mora of the applicative suffix -er-, since Lusoga does not allow LH rising tones. As a result the phrase-final H% boundary tone can only link to the single mora of the last syllable. In the output to the right I show the sequence of Ls fusing as a branching structure so as not to violate the OCP. LTI is expressed as L tone spreading, as in (22).



¹⁴ Thus, compare: *á-ba-kázi bá-sek-a > à-bá-kàzì bà-sèk-á ‘the woman laugh’.

¹⁵ The historical process was undoubtedly the deletion of *H directly, as many languages do not tolerate a H tone vowel at the left edge. If we followed the ∅ analysis, then the initial L on the augment could be attributed to the initial %L boundary tone, as in (21). The augment is transparent to HTA from one word to another.

As shown, the /L/ of /-ʔàlakat-/ ‘scrape’ spreads onto the second mora. This can be interpreted as a response to the two L tone constraint. The H% boundary tone links to the last two moras that follow. As was seen in (1), shorter verb stems will not be able to exhibit both L tone spreading (LTS) and linking of H%:

- (23) a. o- ku- bon- a → o- ku- bon- a ò-kú-bòn-á ‘to see’
 %L H L L H L H%
 | | | |
 | | | |
 | | | |
 | | | |
- b. o- ku- ti- a ò-kú-ty-à° ‘to fear’
 %L H L H%
 | | |
 | | |
 | | |
 | | |

In (23a), the H% boundary tone links to the final vowel /-a/. Since LTI is a word-level word, the L tone of /-ʔòn-/ ‘see’ first spreads onto the FV in (23a), after which phrase-level H% is assigned to the FV, thereby delinking the L. In (23b) H% cannot link or a LH rising tone would result. Instead, the L of the root /-ʔì-/ ‘fear’ spreads onto the final vowel. With final vowel shortening the result is a final level L° tone which is prevented from falling to the lowest pitch by the unlinked H% boundary tone.

In comparing the above approaches, I have been assuming that the analysis which most directly accounts for the facts is the one to be preferred, in other words, the analysis that requires the fewest changes between underlying and output tones. /^HL, Ø/ represents an improvement over the historical /H, Ø/ analysis in (2) which required HTA to both anticipate the H onto the preceding TBU, as well as introduce a L trace on the TBU of the /H/. In the /^HL/ analysis, the L is already linked to the correct output TBU, and the reason for anticipation is encoded in the unlinked property of the /^H/. However, MR requires multiple deletions of the /H/ which could be avoided if we started instead with underlying /L/. The one complication of this latter approach is that one would have to introduce a H tone insertion before a L or sequence of Ls. I propose a constraint that a L (or the first L of a sequence of Ls) must be preceded by H tone. This is not unprecedented, as tone systems often place requirements on what can precede or follow a specific tone.¹⁶ This is what I shall adopt in the remainder of this study: In underlying representations toneless moras will continue to be unmarked, e.g. /o-ku-bal-a/ ‘to count’, while /L/ moras will be indicated with a grave accent, e.g. /o-ku-bòn-a/ ‘to see’. An unmarked TBU that immediately precedes the vowel marked with the grave accent is pronounced H by a process of H tone insertion (HTI), e.g. *o-kú-bòn-a*. As seen in these underlying representations, I will also assume that the augment vowel is underlyingly toneless when occurring initially, but is /L/ when preceded by a proclitic.

This completes the brief presentation of the framework that will be considered in the remainder of this work. The question is whether the /L, Ø/ can insightfully account for the rest of the tone system. In this study we will restrict ourselves to the noun phrase. We will start with noun tones in §4, then consider the tones of various modifiers and noun phrase constructions in §5.

¹⁶ Interestingly, this is identical to the constraint I proposed for Tianjin dialect of Mandarin (Hyman 2007:17-18). In both languages a L (and LH rising tone in Tianjin) must be approached from a H pitch level. The only input /L/ in Lusoga that will not be preceded by a H is the initial %L which has no TBU preceding it.

4. Noun tones

In the previous sections I have restricted discussion to the affirmative infinitive form, which is nominal in its outer morphological structure. (Its inner structure is more verb-like in taking both derivational verb extensions and object markers.) Like other nouns, it belongs to a noun class, in this case class 15, and is marked by the augment + prefix sequence *o-ku-*. The basic (non-derived, non-locative) noun classes and singular/plural pairings are identified with the traditional Bantu numbering and exemplified in (24).¹⁷

| | | | | | | |
|------|-----------|-----------|------------|-----------|-----------|-------------|
| (24) | class 1: | ò-mú-límí | ‘farmer’ | class 2: | à-bá-límí | ‘farmers’ |
| | class 3: | ò-mú-líró | ‘fire’ | class 4: | è-mí-líró | ‘fires’ |
| | class 5: | è-ì-búgá | ‘gourd’ | class 6: | à-má-búgá | ‘gourds’ |
| | class 7: | è-cí-tábó | ‘book’ | class 8: | è-bí-tábó | ‘books’ |
| | class 9: | è-n-dhóvú | ‘elephant’ | class 10: | è-n-dhóvú | ‘elephants’ |
| | class 11: | ò-lú-súsú | ‘skin’ | class 10: | è-n-súsú | ‘skins’ |
| | class 12: | à-ká-tíkó | ‘mushroom’ | class 14: | ò-bú-tíkó | ‘mushrooms’ |

Although classes 1 and 3 have the same noun prefixes, they trigger different concord on agreement elements, and similarly for classes 9 and 10. While most nouns take an augment + noun class prefix, there is a small set (35 out of 572 entries in my current lexicon) which lack both. These nouns, identified as class 1a/2a and 9a/10a singular/plural pairings include certain kinship terms, borrowings, and other items, e.g. *sòngá/bà-sòngá* ‘aunt(s), older sister(s) of parent’, *dáàmú/dáàmú* ‘dam(s), dike(s)’. In order to examine noun tones most fully I will focus on those nouns that do have prefixes. In (24) I have deliberately chosen underlying toneless examples which are realized with the first syllable L and the three remaining syllables H, exactly as infinitives such as *ò-kú-bál-á* ‘to count’. In classes 5, 9 and 10, the V-V- and V-N- prefix syllables are L instead of LH, since a rising tone is not permitted in Lusoga. In what follows I shall survey noun tones by the shape of the noun stem, starting with those which have a stem-initial consonant onset.

4.1. Monosyllabic stems (n = 44)

When the noun stem is monosyllabic there are two tone patterns, realized slightly differently according to whether their augment + prefix sequence is V-CV- or V-V-/V-N-:

| | | | | | |
|------|---------|-------------|--------|----------|-----------------|
| (25) | *L stem | (> L-H(-H)) | | *H stem | (> (L-)H-L) |
| a. | ò-mú-zí | ‘root’ | /-zii/ | ò-mú-tì | ‘tree’ /-tìì/ |
| | è-cí-fó | ‘place’ | /-foo/ | ò-mú-twè | ‘head’ /-tùè/ |
| | ò-lú-mú | ‘ringworm’ | /-muu/ | è-cí-rè | ‘cloud’ /-rèè/ |
| b. | è-ì-gé | ‘termite’ | /-gee/ | é-í-ghà | ‘thorn’ /-ghàà/ |
| | è-n-té | ‘cow’ | /-tee/ | é-m-bwà | ‘dog’ /-bùà/ |
| | è-n-dá | ‘belly’ | /-daa/ | é-n-dhù | ‘house’ /-dhùù/ |

¹⁷ Class 13 apparently exists only as an alternative to plural class 14 in diminutivization: *é-m-bwà* ‘dogs’ → *ò-bú-bwà* ~ *ò-tí-bwà* ‘small dogs’ (see §4.11 below).

(n = 12)

(n = 32)

In (25) I have organized the columns by their correspondence to PB *L and *H stem tones, as well as their prefix shape. As seen the left hand column, nouns in (25a) have L on the augment and H tone (from H%) on their prefix and stem. The corresponding nouns in (25b) have a single L tone syllable, since the H% cannot form a rising tone on the *-i-* or *-N-* prefix (*è-í-gé, *è-ń-té *[èè-n-té]). The nouns in the right column of (25a) have a single H tone on their prefix, which is from H tone insertion (HTI) before an underlying /L/. In (25b) the H is first assigned to the *-i-* or *-N-* prefix and then spreads to the augment, again to avoid a LH rising (*è-í-ghà, *è-ń-bwà *[èè-m-bwà]). Note that I have kept the orthographic consonants in representing the underlying stem forms (*c* = [tʃ], *dh* = [d], *gh* = [ɣ]). However, I show a long vowel or vowel sequence, since monosyllabic stems are all underlyingly bimoraic in Lusoga, as in Luganda and other closely related Bantu languages.

4.2. CVCV stems (n = 193)

When we turn to bisyllabic CVCV stems, we now find that there are three tone patterns. The first two in (26a,b) neatly correspond to the two verb infinitive patterns, while the third in (26c) is found in a limited number of borrowings.

| | | | | | | | |
|------|----|---------|------------|---------|-----------|----------|-----------|
| (26) | a. | L-H-H-H | ò-mú-génhí | ‘guest’ | è-cí-bírá | ‘forest’ | (n = 67) |
| | | L-H-H | è-ì-gúlú | ‘sky’ | è-n-gómá | ‘drum’ | |
| | b. | L-H-L-H | ò-mú-kàzí | ‘woman’ | é-í-támá | ‘cheek’ | (n = 107) |
| | | H-L-H | ò-mú-sòtá | ‘snake’ | é-m-pítí | ‘hyena’ | |
| | c. | L-H-H-L | è-cí-kópò | ‘cup’ | ò-mú-gólè | ‘bride’ | (n = 20) |
| | | H-H-L | é-í-róbò | ‘hook’ | é-n-thúpà | ‘bottle’ | |

The nouns in (26a) are underlyingly toneless, e.g. /o-mu-genhi/. Those in (26b) have an underlying /L/ on the first vowel of their stem, e.g. /o-mu-kàzi/. These tone patterns are well understood. It is the (L-)H-H-L pattern in (26c) that is new. It can be easily accounted for if we assume that the last mora carries an underlying /L/, as in (27):

| | | | | | | | | |
|------|----|-------------|-----------|-------|----|------------|----------|--------|
| (27) | a. | e- ci- kopo | è-cí-kópò | ‘cup’ | b. | e- i- robo | é-í-róbò | ‘hook’ |
| | | | | | | | | |
| | | %L | H L | H% | | %L | H L | |

In (27a) the inserted H links to the two moras (syllables) that precede the underlying /L/. The augment remains L, presumably to take the %L boundary tone. The same occurs in (27b), except that the H must also link to the augment, thereby avoiding a rising tone. The pattern in (26c) is markedly less common than the other two and, as said, many of these nouns are borrowed, e.g. è-cí-kópò ‘cup’ (from English through Luganda or Swahili).

4.3. CVVCV stems (n = 190)

Nouns with CVVCV stems have one more mora, and perhaps not surprisingly, one more tone pattern:

| | | | | | | |
|---------|----------|-------------|----------------|-------------|------------|----------|
| (28) a. | L-H-H-H | ò-mú-sááyí | ‘blood’ | ò-mú-kééká | ‘mat’ | (n = 59) |
| | L-H-H | è-ì-kóólá | ‘leaf’ | è-n-táámá | ‘sheep’ | |
| b. | L-H-L-H | ò-mú-sààdhá | ‘man’ | è-cí-wùùkà | ‘insect’ | (n = 54) |
| | H-L-H | é-í-bààlé | ‘stone’ | é-m-bììdhí | ‘pig’ | |
| c. | L-H-H-L | è-cí-déédè | ‘grasshopper’ | ò-mú-séénzè | ‘migrant’ | (n = 26) |
| | H-H-L | é-í-dáálà | ‘ladder’ | é-n-dáádà | ‘squirrel’ | |
| d. | L-H-HL-H | è-cí-jîkó | ‘spoon, ladle’ | à-ká-sààlé | ‘arrow’ | (n = 11) |
| | H-HL-H | é-í-dwáàyá | ‘jaw’ | é-n-dyáàngá | ‘bag’ | |

Again, the first two patterns represent the two basic patterns we have seen on shorter forms, including verb infinitives: (28a) contains toneless noun stems, e.g. /o-mu-saayi/, while (28b) consists of nouns that have the /L/ on their first stem mora, e.g. /o-mu-sàadhá/. The nouns in (28c) correspond to those in (26c): They have a /L/ on their last vowel, as in (29a). The new patterns, (28d), which likely consists mostly of borrowings, has a /L/ on the second mora of its stem-initial syllable, as in (29b).

| | | | | | |
|---------|--------------|---------------|----|--------------|-------------------|
| (29) a. | e- ci- deede | è-cí-déédè | b. | e- ci- jiiko | è-cí-jîkó ‘spoon’ |
| | ⋮ ⋮ ⋮ | ‘grasshopper’ | | ⋮ ⋮ ⋮ | |
| | %L H L H% | | | %L HL H% | |

As seen, whether the long CVV penultimate syllable is all H, or has a H to L falling tone, depends on where the underlying /L/ is linked: In (29a) it is linked to the vowel of the final syllable; in (29b), it is linked to the second mora of the penultimate syllable. In both cases the unlinked H is assigned to the available moras, short of the initial augment.

4.4. CVCVCV stems (n = 45)

One we move on to consider nouns with three or more stem syllables, the number of lexical entries diminish dramatically. As will be seen from the examples, many if not most are either derived or borrowed. To start, trisyllabic CVCVCV stems show five patterns, one of which is rare and exceptional:

| | | | | | | |
|---------|-----------|--------------|-----------------|--------------|--------------|----------|
| (30) a. | L-H-H-H-H | ò-lú-lágálá | ‘banana leaf’ | è-cí-dómólá | ‘jerry can’ | (n = 15) |
| | L-H-H-H | è-ì-sóméró | ‘school’ | è-n-sóghérá | ‘housefly’ | |
| b. | L-H-L-L-H | ò-bú-thùpùzí | ‘corruption’ | ò-bú-dòbànú | ‘rudeness’ | (n = 10) |
| | H-L-L-H | é-í-yègèró | ‘school’ (rare) | é-n-dògòyí | ‘donkey’ | |
| c. | L-H-H-L-H | ò-mú-pákàsí | ‘porter’ | ò-mú-dólòmé | ‘lizard sp.’ | (n = 8) |
| | L-H-L-H | è-gálàjí | ‘garage’ | è-kámèrá | ‘camera’ | |
| d. | L-H-H-H-L | ò-mú-wálábù | ‘Arab’ | ò-lú-kúgúnhù | ‘hipbone’ | (n = 9) |
| | H-H-H-L | é-í-kúgúnhù | ‘hip’ | é-n-sékèrè | ‘louse’ | |
| e. | L-L-H-L | è-bàkùlì | ‘bowl’ | | | (n = 3) |
| | L-H-L | kàsírù | ‘deaf person’ | dòlówà | ‘drawer’ | |

Again, the first two patterns are straightforward, mirroring the two patterns of infinitives. The patterns in (30c,d) also follow from what we have seen: The nouns in (30c) have a /L/ linked

Clearly the /L/ cannot be on the first or second mora of the CVV syllable, since these patterns exist in (32b) and (32c), respectively. One is perhaps tempted to place it on the third mora, i.e. /-faanani/, /-duukulu/, and /poongolo/, an analysis that is occupied by the one borrowed noun in (32d). Assuming that (32d) does not represent a native Lusoga pattern, perhaps the unlinked H skips over the first mora of the stem to go directly on the prefix. Or perhaps one simply needs to multiply link the L in the underlying representations. Just as we could not account for *è-bàkùlì* ‘bowl’ in the preceding subsection, we can leave these four nouns as exceptional.¹⁹

4.6. CVCVVCV stems (n = 20)

The following tone patterns have been found on nouns with trisyllabic stems of the shape CVCVVCV:

| | | | | | | | |
|------|----|------------|-----------------------------|-------------|----------------------------|--------------|---------|
| (33) | a. | L-H-H-H-H | <i>è-cí-fá<u>g</u>áántá</i> | ‘bundle’ | <i>è-cí-lá<u>g</u>áánó</i> | ‘vow’ | (n = 7) |
| | | L-H-H-H | <i>è-n-dá<u>g</u>áánó</i> | ‘promise’ | <i>è-n-dóbóó<u>z</u>í</i> | ‘dry season’ | |
| | b. | L-H-H | <i>kà<u>d</u>áálí</i> | ‘crown’ | | | (n = 1) |
| | c. | L-H-L-L-H | <i>ò-mú-tà<u>m</u>ìivú</i> | ‘drunkard’ | <i>è-cí-bù<u>g</u>ùdó</i> | ‘festivity’ | (n = 6) |
| | | H-L-L-H | <i>é-n-dì<u>k</u>ìzà</i> | ‘darkness’ | | | |
| | | L-L-H | <i>dù<u>l</u>yèènké</i> | ‘bird sp.’ | | | |
| | d. | H-L-H | <i>kó<u>d</u>yààní</i> | ‘accordion’ | | | (n = 1) |
| | e. | L-H-H-HL-H | <i>è-cí-fé<u>n</u>éésí</i> | ‘jackfruit’ | | | (n = 5) |
| | | H-H-HL-H | <i>é-í-lóbó<u>o</u>zí</i> | ‘voice’ | <i>é-í-tá<u>f</u>áàlí</i> | ‘brick’ | |

Again, the nouns are arranged by which (underlined) mora of the stem has the underlying /L/ tone. The nouns in (33a) are underlyingly toneless, as is the one noun in (33b) likely to be (where again there may be a frozen [ka] prefix). The nouns in (33c) have a linked L on their first mora, which is unproblematic. There is only one noun in (33d), clearly a borrowing, that has been found to have its linked L on its second mora. A few more in (33e) have a linked L on their third mora.

4.7. CVVCVVCV stems (n = 20)

The last set of tone patterns concerns trisyllabic noun stems which have a long vowel in both their first and second syllables. (Since there is a rule of final vowel shortening, citation forms of nouns never have a long vowel on their final syllable.) The following tone patterns have been found, again underlining the /L/ tone mora:

| | | | | | | | |
|------|----|-----------|-------------------------------|---------|-------------------------------|---------------|---------|
| (33) | a. | L-H-H-H-H | <i>è-cí-dá<u>a</u>ándáálí</i> | ‘bean’ | <i>à-ká-tá<u>a</u>ándááló</i> | ‘drying rack’ | (n = 9) |
| | | L-H-H-H | <i>è-n-dí<u>f</u>bóótá</i> | ‘bale’ | <i>è-dá<u>a</u>kíká</i> | ‘minute’ | |
| | b. | L-H-L-H-H | <i>è-cí-dò<u>o</u>mbóódó</i> | ‘dregs’ | | | (n = 1) |

¹⁹ Note however that the derived noun *ò-mú-tàmìiv-ú* ‘drunkard’ shows the same problem (cf. *ò-kú-támíir-á* ‘to become drunk’). Although not discussed in this study, verbs exhibit tone patterns that suggest a multiply linked L tone “melody”, also in deverbal nouns (cf. (33)).

| | | | | | | |
|----|------------|----------------|------------------|---------------|--------------|---------|
| c. | L-H-HL-L-H | è-cí-táàngààlá | ‘light’ | | | (n = 3) |
| | L-HL-L-H | è-c-òòdòdó | ‘plenty’ | ò-mw-óòndòní | ‘sinner’ | |
| d. | L-H-H-HL-H | à-ká-káányáàvú | ‘chameleon’ | | | (n = 3) |
| | H-H-HL-H | é-n-kóóffîrá | ‘hat’ | è-ry-áándáàzí | ‘wheat bun’ | |
| e. | L-H-L-L-H | ò-bú-dùumùùfú | ‘elasticity’ | ò-bú-fùumùùfú | ‘paleness’ | (n = 4) |
| | | òmú-dàànkàànú | ‘spoiled person’ | ò-bú-yòòyòòté | ‘smoothness’ | |

Only the nouns in (33e) are a problem, since there are four moras of L tone. Significantly they are all derived from verbs: *ò-kú-dúúmúúk-á* ‘to become elastic’, *ò-kú-dáánkáán-á* ‘to be spoiled’, *ò-kú-fúúmúúk-á* ‘to be pale’, *ò-kú-yòòyòót-á* ‘to be well tended’. Again, it may be necessary to assign another pattern of multiply linked L tones, something which we will also see in the verb tone patterns.

4.8. Residual cases

As seen in the preceding subsections, the /L/ analysis works rather well, with relatively little residue. Besides those already pointed out, we can add further inconsistencies in how the tone of class 5 /e-i-/ and class 9/10 /e-N-/ augment-prefix sequences are realized. Whereas we expect these to be H tone except on toneless words which have a L-Hⁿ realization, there are a handful of nouns with a HL-L bisyllabic stem which take a L prefix, as in (33a).

| | | | | | | | |
|------|----|----------|--------------|------------|--------------|-------------------|---------|
| (33) | a. | L-HL-H | è-ì-dîíní | ‘religion’ | è-ì-dîíró | ‘parlor’ | (n = 5) |
| | | | è-n-kwáàghá | ‘armpit’ | è-m-bóòlí | ‘potato’ | |
| | | | è-m-pînyá | ‘money’ | | | |
| | b. | H-HL-H | é-í-dwáàyá | ‘jaw’ | é-n-dyáàngá | ‘bag, pocket’ | (n = 2) |
| | c. | H-H-HL-H | é-í-táfáàlí | ‘brick’ | é-í-lóbóòzí | ‘voice’ | (n = 4) |
| | | | é-n-kóóffîrá | ‘hat’ | é-m-púmúùmpú | ‘banana seedling’ | |

While the expected H-HL-H pattern in (33b) is attested only in two nouns, longer nouns show only a H tone *é-í* sequence, as in (33c). Some of the above nouns are borrowed, e.g. *è-m-pînyá* ‘money’ which occurs as class 11 *lùpînyá* from Hindi *rupee* in neighboring languages. Even though *lùpînyá* does not take class 11 (rather class 9 or 10) agreement, Lusoga speakers apparently identified the initial [lu] as the class 11 prefix, *lù-pînyá*, whose plural class 10 form (*è-*)*m-pînyá* form came to be used. Perhaps the forms in (33) have been influenced by class 9/10 nouns which lack a nasal prefix. When these take the augment /e-/, its tone is L, as in (34a-d), unless followed immediately by an underlying /L/, in which case /e-/ becomes *é-* by HTI, as in (34e):

| | | | | | | | |
|------|----|---------|-------------|--------------|--------------|-----------|---------|
| (34) | a. | L-HL-H | è-sèénté | ‘money’ | è-gáàlí | ‘bicycle’ | (n = 3) |
| | | | è-múùndú | ‘gun’ | | | |
| | b. | L-H-L | è-kápà | ‘cat’ | è-púúsi | ‘cat’ | (n = 4) |
| | | | è-ghéémà | ‘tent’ | è-sáàtì | ‘shirt’ | |
| | c. | L-H-L-H | è-gálàjí | ‘garage’ | è-kámèrá | ‘camera’ | (n = 2) |
| | d. | other | è-bàkúli | ‘bowl’ | è-bùlààngítì | ‘blanket’ | (n = 3) |
| | | | è-sèèṅéèngé | ‘wire fence’ | | | |
| | e. | H-L-H | é-nàkú | ‘sorrow’ | é-nùmé | ‘bull’ | (n = 8) |

| | | | |
|------------|--------|----------|--------|
| é-nhànhá | ‘lake’ | é-nhànhá | ‘calf’ |
| é-nhiiindó | ‘nose’ | é-mààmbá | ‘meat’ |

In other words, no noun begins with the augment *é-* followed immediately by a H tone on the first mora of the stem. Interestingly, all of the nouns in (34e) are native Lusoga and likely to have undergone nasal simplification: **é-n-nàkú* > *é-nàkú* ‘sorrow’. Again, most or all of the nouns in (34a-d) are borrowed. Some may require exceptional prespecified tones.

4.9. Nouns without augment

In the preceding subsections all examples were illustrated with the initial augment vowel *e-*, *o-* or *a-*. While the augment is present in most grammatical contexts, including the citation form of nouns, there are other contexts where it is absent, e.g. before the enclitic =*ci* ‘which’, after a copula or negative verb. An initial augmentless noun is best analyzed as having a zero copula: *è-cí-kópò* ‘cup’ vs. *cí-kópò* ‘it’s a cup’. In most cases there is no effect on the tone. The major exception is toneless nouns whose prefix-augment sequence is V-CV-. As seen in (35a), when the augment is absent, the noun class prefix itself carries the one L tone (attributable to the initial %L boundary tone):

| | | | | |
|---------|-------------|---------------|------------|----------------------|
| (35) a. | ò-mú-zí | ‘root’ | mù-zí | ‘it’s a root’ |
| | ò-mú-génhí | ‘guest’ | mù-límí | ‘s/he’s a guest’ |
| | ò-lú-lágálá | ‘banana leaf’ | lù-lágála | ‘it’s a banana leaf’ |
| b. | è-ì-gé | ‘termite’ | ì-gé | ‘it’s a termite’ |
| | è-ì-gúlú | ‘sky’ | ì-gúlú | ‘it’s a sky’ |
| | è-ì-sóméro | ‘school’ | ì-sóméro | ‘it’s a school’ |
| c. | è-n-té | ‘cow’ | òn-té | ‘it’s a cow’ |
| | è-n-gómá | ‘drum’ | òn-gómá | ‘it’s a drum’ |
| | è-n-sóghérá | ‘housefly’ | òn-sóghérá | ‘it’s a housefly’ |

There is no change in tone when the augment sequence is class 5 *è-ì-*, as in (35b) or class 9 or 10 *è-N-*, as in (35c), although in the latter case the nasal becomes syllabic and carries the L tone.²⁰ With all other tone patterns of prefixed nouns, the absence of the augment simply means that the noun will begin with a H tone prefix, e.g.

| | | | | |
|---------|--------------|----------|------------|-------------------|
| (35) a. | ò-mú-tì | ‘tree’ | mú-tì | ‘it’s a tree’ |
| | ò-mú-sòtá | ‘snake’ | mú-sòtá | ‘it’s a snake’ |
| | ò-mú-pákàsí | ‘porter’ | mú-pákàsí | ‘s/he’s a porter’ |
| b. | é-í-ghà | ‘thorn’ | í-ghà | ‘it’s a thorn’ |
| | é-í-támá | ‘cheek’ | í-támá | ‘it’s a cheek’ |
| | é-í-kúghúnhù | ‘hip’ | í-kúghúnhù | ‘it’s a hip’ |
| c. | é-m-bwà | ‘dog’ | m-bwà | ‘it’s a dog’ |
| | é-m-pítí | ‘hyena’ | m-pítí | ‘it’s a hyena’ |

²⁰ Although the nasal in words such as *è-n-té* ‘cow’ and *é-m-bwà* ‘dog’ is non-syllabic, an NC sequence always triggers lengthening of the preceding vowel, hence [è:nté], [é:mbwà]. While I indicate this predictable length when there is a preceding consonant, e.g. *ò-kú-túúnd-á* ‘to sell’, I write initial V-N- sequences with a short vowel.

é-n-sékéré 'louse' ní-sékéré 'it's a louse'

When the augment *e-* is absent on class 9 or 10 nouns which lack a nasal prefix, the word begins with the stem:

- (36) a. è-ghéémà 'tent' ghéémà 'it's a tent'
 b. è-séènté 'money' séènté 'it's money'
 c. è-gálàjí 'garage' gálàjí 'it's a garage'
 d. è-bàkúli 'bowl' bàkúli 'it's a bowl'
 e. èdáákííká 'minute' dáákííká 'it's a minute'

4.10. Nouns with vowel-initial stems

Of the 574 nouns in the current lexicon, 58 have a vowel-initial stem. Instead of folding them into each of the above patterns, they are illustrated in (37).

- (37) a. L-H-H ò-lw-íjǐ 'door' ò-mw-íǐǵá 'river' (n = 11)
 ò-lw-ééyó 'broom' è-c-ááló 'village'
 b. L-HL-H ò-mw-ááná 'child' è-rí-ìsó 'eye' (n = 28)
 à-má-àdhí 'water' ò-bw-ǐrè 'night'
 c. L-H-H-H ò-mw-áámizí 'commander' ò-mw-óógézí 'speaker' (n = 3)
 ò-mw-áálíró 'alter, level'
 d. L-H-H-L ò-mw-áángúkà 'loud voice' (n = 1)
 e. L-HL-L-H ò-mw-óòlèsó 'exhibition' ò-mw-óònòóní 'sinner' (n = 6)
 ò-mw-áàzísí 'lender' ò-bw-ǐbùkà 'blessings'
 f. L-H-H-H-L à-má-áǵáánánà 'junction' (n = 1)
 f. L-H-HL-H è-ry-áándáàzǐ 'fried bun' (n = 1)
 g. L-HL-L-H-H ò-mw-éèǵèrésá 'teacher' òbw-ǐnòǵòvú 'coldness' (n = 6)
 è-c-éèsìǵíró 'pillow' è-céèsìtázó 'scandal'
 h. L-HL-L-L-H-H ò-mw-éèrèsébwá 'learner' (n = 1)

As seen, the vowel of the CV- prefix either glides or is deleted before a vowel-initial stem. As before, longer stems are mostly derived, e.g. *o-kw-óógér-á* 'to speak', *ò-mw-óógézí* 'speaker'; *ò-kw-áàzík-á* 'to lend', *ò-mw-áàzísí* 'lender'.

One last noun worth considering in this context is: *ò-múú-ntú* 'person', plural *à-báá-ntú*. As in many other Bantu languages in the area, this is the only noun stem that begins with a NC sequence. A common reconstruction is: **ó-mù-jǐntù* > *ó-mù-ìntù* > *ó-mù-ntù*, with irregular loss of the stem-initial **i*.

4.11. Derived noun classes

As seen in (24) there seven singular and six plural noun classes to which nouns inherently belong. These are singular classes 1, 3, 5, 7, 9, 11, 12 and plural classes 2, 4, 6, 8, 10, 14. While some nouns have only a singular or plural form, most enter into singular/plural pairs, mostly 1/2, 3/4, 5/6, 7/8, 9/10, 11/10 and 12/14. Five of these pairings also have a derived

function. These are illustrated in (38) by means of the base nouns *ò-mú-límí/à-bá-límí* ‘farmer(s) 1/2, *ò-mú-sòtá/è-mí-sòtá* ‘snake(s) 3/4, and *ò-mú-tì/è-mí-tì* ‘tree(s) 3/4.

| | | | |
|------|------------------|------------------|---------------------------------------|
| (38) | <i>singular</i> | <i>plural</i> | |
| a. | <i>class 12</i> | <i>class 14</i> | <i>diminutive</i> |
| | <i>à-ká-límí</i> | <i>ò-bú-límí</i> | ‘small farmer(s)’ |
| | <i>à-ká-sòtá</i> | <i>ò-bú-sòtá</i> | ‘small snake(s)’ |
| | <i>à-ká-tì</i> | <i>ò-bú-tì</i> | ‘small tree(s)’ |
| b. | <i>class 20</i> | <i>class 22</i> | <i>augmentative</i> |
| | <i>ò-gú-límí</i> | <i>à-gá-límí</i> | ‘big farmer(s)’ |
| | <i>ò-gú-sòtá</i> | <i>à-gá-sòtá</i> | ‘big snake(s)’ |
| | <i>ò-gú-tì</i> | <i>à-gá-tì</i> | ‘big tree(s)’ |
| c. | <i>class 7</i> | <i>class 8</i> | <i>compressed</i> |
| | <i>è-cí-límí</i> | <i>è-bí-límí</i> | ‘short, fat farmer(s)’ |
| | <i>è-cí-sòtá</i> | <i>è-bí-sòtá</i> | ‘short, fat snake(s)’ |
| | <i>è-cí-tì</i> | <i>è-bí-tì</i> | ‘short, fat tree(s)’ ²¹ |
| d. | <i>class 11</i> | <i>class 10</i> | <i>elongated</i> |
| | <i>ò-lú-límí</i> | <i>è-nímí</i> | ‘tall, thin farmer(s)’ |
| | <i>ò-lú-sòtá</i> | <i>é-n-sòtá</i> | ‘long, thin snake(s)’ |
| | <i>ò-lú-tì</i> | <i>é-n-tì</i> | ‘tall, thin tree(s)’ |
| e. | <i>class 5</i> | <i>class 6</i> | <i>abnormal</i> |
| | <i>é-í-límí</i> | <i>à-má-límí</i> | ‘big, bad farmers, not well-groomed’ |
| | <i>é-í-sòtá</i> | <i>à-má-sòtá</i> | ‘big, aggressive poisonous snake(s)’ |
| | <i>é-í-tì</i> | <i>à-má-tì</i> | ‘big, diseased, ugly looking tree(s)’ |

As seen, the derived noun classes in (38a,b) and (38c,d) consist of semantically opposite pairs: diminutive/augmentative, compressed/elongated.²² The sense of the derivatives in (38e) is more open-ended, signaling that the object is large in size and abnormal, bad or wrong in some way. Two more examples: When *è-cí-kópò* ‘cup’ becomes class 5 *é-í-kópò* there is something wrong with the big cup: it might be dirty, have a bad design, not hold liquid properly; when *è-cí-myààmyá* ‘a spot on a cloth’ becomes *é-í-myààmyá*, it means a big and particularly bad looking spot. As the examples show, except for the minor differences between *e-i-/e-N-* and *V-CV-* prefix sequences, shifting a noun from its basic class to one of these derived ones has no tonal consequence.

The structure is different concerning the three locative noun classes 16 *gha=*, 17 *ku=* and 18 *mu=*, which have the meanings ‘near’, ‘on, at’ and ‘in’, respectively. As seen in (39), these are added as proclitics outside the (non-augmented) base noun:

| | | | | | | |
|------|------------------|---------|-----------------|----------------------|----------------------|---------------------|
| (39) | <i>base noun</i> | | <i>singular</i> | <i>plural</i> | | |
| a. | <i>ò-mú-sòtá</i> | ‘snake’ | → | <i>ghà = mú-sòtá</i> | <i>ghà = mí-sòtá</i> | ‘near the snake(s)’ |

²¹ *è-cí-tì* also has the lexicalized meanings ‘stump’ and ‘stick’.

²² Class 13 *ò-tú-* can also be used as a plural in diminutivization. In this case the noun sounds really tiny and short: *ò-tú-límí* ‘really short farmers’ (the tiniest you can get), *ò-tú-sòtá* ‘really tiny, short snakes’, *ò-tú-tì* ‘really tiny short trees’.

| | | | | | | |
|----|-----------|---------|---|---------------|---------------|---------------------|
| | è-cí-kópò | ‘cup’ | → | ghà = cí-kópò | ghà = bí-kópò | ‘near the cup(s)’ |
| | è-ì-búgá | ‘gourd’ | → | ghà = ì-búgá | ghà = mà-búgá | ‘near the gourd(s)’ |
| b. | ò-mú-sòtá | ‘snake’ | → | kù = mú-sòtá | kù = mí-sòtá | ‘on the snake(s)’ |
| | è-cí-kópò | ‘cup’ | → | kù = cí-kópò | kù = bí-kópò | ‘on the cup(s)’ |
| | è-ì-búgá | ‘gourd’ | → | kw = ì-búgá | kù = mà-búgá | ‘on the gourd(s)’ |
| c. | ò-mú-sòtá | ‘snake’ | → | mù = mú-sòtá | mù = mí-sòtá | ‘in the snake(s)’ |
| | è-cí-kópò | ‘cup’ | → | mù = cí-kópò | mù = bí-kópò | ‘in the cup(s)’ |
| | è-ì-búgá | ‘gourd’ | → | mw = ì-búgá | mù = mà-búgá | ‘in the gourd(s)’ |

Although the tones do not change, the forms with toneless *mà-búgá* ‘gourds’ show that the locative markers have to be proclitics: The H% which is responsible for the two final H tones does not reach the noun class prefix *ma-* as it does when the augment is present: *à-má-búgá*. Thus, the augment is a prefix, while the locative markers in (39) are proclitics.

As also indicated, the locative proclitics introduce their own noun class, as they can trigger locative class agreement, e.g. *kù = cì-sééngé c-ààngé* ~ *kù = cì-sééngé kw-ààngé* ‘on my wall’.²³ They also generally appear without an augment of their own. The major exception is when they appear after an augmented connective, which is used to express possession and other relations between noun phrases. While (40a) shows that the connective is not required to express the location within a noun phrase, its presence in (40b) adds the meaning of ‘belonging to’.

- (40) a. è-bí-wùùkà mù = cì-tábó ‘the insects in the book’
 b. è-bí-wùùkà è-by’ = óó-mù = cì-tábó ‘the insects belonging in the book’
 c. bí-wùùkà by-àà = mù = cì-tábó ‘it’s the insects belonging in the book’

The contrast with (40c) shows that the augment is present on the locative in (40b) only as a kind of augment agreement which is quite pervasive in the language, as in Luganda (Hyman & Katamba 1993b).

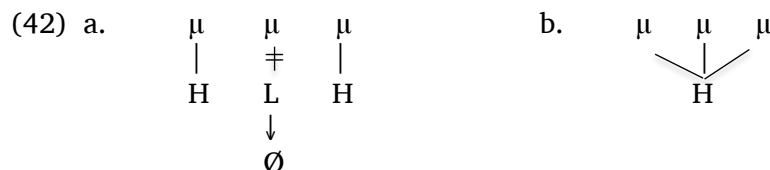
An important fact is that both *mù =* and the prefix *cì-* have L tone in all three examples in (40). As discussed, the H% boundary tone cannot reach either the prefix or the proclitic. It will also be noted that the proclitic /e-bi-a=/ ‘those of’ (class 8) receives the inserted H triggered by the following augment vowel /ò-/, just as the proclitic /na=/ ‘and, with’ did in (8). Now consider the corresponding forms in (41), where ‘cup’ is substituted for ‘book’:

- (41) a. è-bí-wùùkà mù = cí-kópò ‘the insects in the cup’
 b. è-bí-wùùkà è-by’ = óó-mù = cí-kópò ‘the insects belonging in the cup’
 c. bí-wùùkà by-àà mù = cí-kópò ‘it’s the insects belonging in the cup’

While underlyingly toneless /mu=/ has the expected L tone in (41a,c), it appears with H tone in (41b). This is because of a rule of H tone plateauing (HTP) that needs to be introduced at

²³ Whether one gets “external” locative agreement or “internal” non-locative agreement depends on a number of grammatical and semantic factors. The locative class is required in subject-verb agreement: *mù = nhúumbá mù-lí-mù è-bí-nhónhí bì-bìrì* ‘in the house are two birds’. Within the noun phrase, locative agreement implies the meaning of being at the inside or outside of the object or structure: *y-á-lùmùk-ìr-á mù = nhúumbá y-ààngé* ‘he ran into my house’, *y-á-lùmùk-ìr-á mù = nhúumbá mw-ààngé* ‘he ran to the insides of the house’ (e.g. the ceiling, secret hiding place within the house).

this point which changes a H-L*-H sequence to a H plateau. We can assume that the L delinks and is ultimately deleted, as in (42a), and the two Hs fuse into a single H with multiple linking, as in (42b).



As seen in Hyman (2016) HTP only applies within the clitic group in Lusoga (vs. a larger “tone group” in Luganda). We will see in the next section that HTP appears also to apply in noun reduplication.

4.11. Noun reduplication

As in most Bantu languages, reduplication is quite widespread in Lusoga. In nouns, reduplication derives the derogatory meaning ‘a bad example of X’, e.g. *ò-mú-límí* ‘farmer’ → *ò-mú-límí-límí* ‘a bad example of a farmer, a lousy ol’ farmer’. As seen in the following examples, only the stem material can reduplicate in Lusoga:²⁴

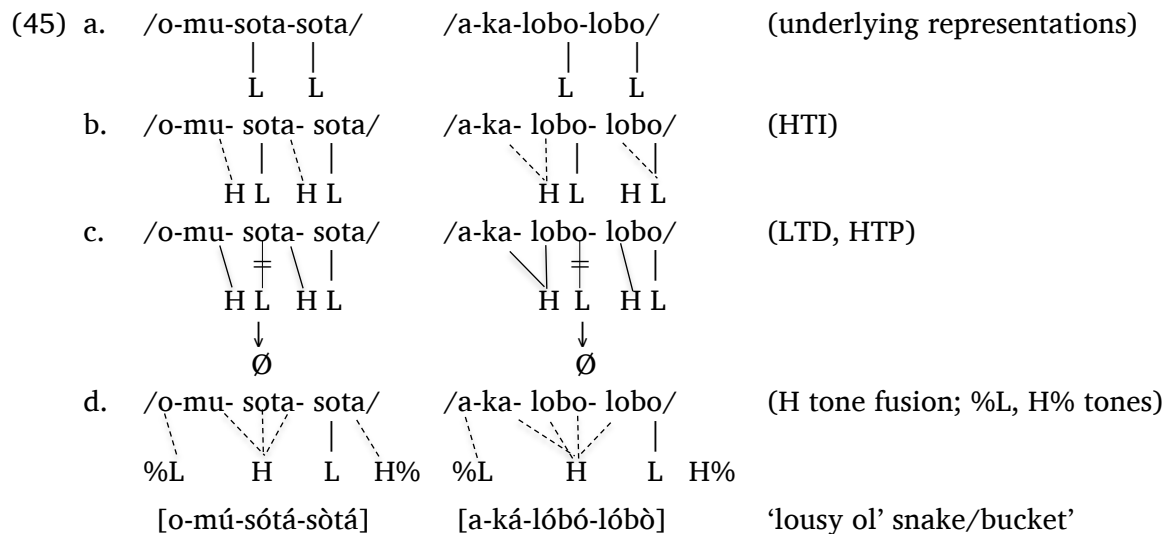
| (43) | <i>base noun</i> | | <i>reduplication</i> | |
|------|--------------------|---------------|----------------------|---|
| a. | <i>ò-mú-zí</i> | ‘root’ | → | <i>ò-mú-zíí-zí</i> ‘a lousy root’ |
| | <i>è-n-té</i> | ‘cow’ | → | <i>è-n-téé-té</i> ‘a lousy cow’ |
| b. | <i>ò-mú-génhí</i> | ‘guest’ | → | <i>ò-mú-génhí-génhí</i> ‘a lousy guest’ |
| | <i>è-m-pálá</i> | ‘leopard’ | → | <i>è-m-pálá-pálá</i> ‘a lousy leopard’ |
| c. | <i>ò-lú-lágálá</i> | ‘banana leaf’ | → | <i>ò-lú-lághálá-lághálá</i> ‘a lousy banana leaf’ |
| | <i>è-n-sóghérá</i> | ‘housefly’ | → | <i>è-n-sóghérá-sóghérá</i> ‘a lousy housefly’ |

The examples in (43) all involve underlyingly toneless noun stems. When the noun stem has an underlying /L/, the tone of the stem reduplicates:

| (44) | <i>base noun</i> | | <i>reduplication</i> | |
|------|------------------|----------|----------------------|---|
| a. | <i>ò-mú-tì</i> | ‘tree’ | → | <i>ò-mú-tíí-tì</i> ‘a lousy tree’ |
| | <i>é-m-bwà</i> | ‘dog’ | → | <i>é-m-bwáá-bwà</i> ‘a lousy dog’ |
| b. | <i>ò-mú-sòtá</i> | ‘snake’ | → | <i>ò-mú-sótá-sòtá</i> ‘a lousy snake’ |
| | <i>é-m-bùzì</i> | ‘goat’ | → | <i>é-m-búzì-bùzì</i> ‘a lousy goat’ |
| c. | <i>à-ká-lóbò</i> | ‘bucket’ | → | <i>à-ká-lóbó-lóbò</i> ‘a lousy bucket’ |
| | <i>é-n-thúpà</i> | ‘bottle’ | → | <i>é-n-thúpá-thúpà</i> ‘a lousy bottle’ |

²⁴ Unlike certain other Bantu languages, Lusoga does not allow the noun class prefix to reduplicate: *ò-mú-zí* ‘root’ → **ò-mú-zí-mú-zí*. Note that while the reduplicated forms are cited without a change of noun class, it is quite natural for them to be shifted into other classes, e.g. 7/8, e.g. *ò-mú-zí* ‘root’ → *è-cí-zíí-zí*, *è-n-té* ‘cow’ → *è-cí-téé-té*. As seen, the underlying two moras of monosyllabic stems are preserved in the first stem, while the second stem undergoes final vowel shortening (FVS).

In each of the above reduplications, the second stem retains the tones of the unreduplicated stem, while the first stem and its noun class prefix are all H. (In the second example of each set, the nasal prefix is H, but the augment is also pronounced H in order to avoid a LH rising tone.) The following representative derivations show that the output tones are exactly as expected:²⁵



5. The noun phrase

In this section I consider the major modifiers on nouns within the noun phrase. To capture the facts, it is necessary both to consider these modifiers in isolation (as when they occur in citation or without an overt head, e.g. “mine”, “this one” etc.) as well as when they occur with a head noun, whose tone is sometimes affected. As will be seen, most modifiers follow the noun in Lusoga. I will begin with adjectives, because they are the most noun-like, then consider possessive pronouns, demonstratives, numerals, and other modifiers. They also most directly reveal the difference between final L vs. final ∅ syllables on the preceding noun.

5.1. Adjectives

As in most Bantu languages, adjectives are morphologically nouns in Lusoga. The major difference is that they do not have an inherent noun class, rather take their noun class by agreement with the noun they modify. This is illustrated in (35), with the adjective stem /-nène/ ‘big’, where the final H is from the H% boundary tone:

- | | | | | |
|------|----------|-----------|----------|-----------|
| (46) | class 1: | ò-mú-nèné | class 2: | à-bá-nèné |
| | class 3: | ò-mú-nèné | class 4: | è-mí-nèné |
| | class 5: | è-ì-nèné | class 6: | à-má-nèné |
| | class 7: | è-cí-nèné | class 8: | è-bí-nèné |

²⁵ An alternative analysis is to assume that the /L/ is not copied on the first stem, which however goes against the more usual situation in Bantu, e.g. in Luganda. An argument for assuming the derivation in (45) is that a process of L tone deletion is independently needed, as it is unambiguously triggered by certain combinations of word + enclitic, e.g. *tw-áá-ghùlír-a* ‘we heard vs. *tw-áá-ghùlír-á = cí* ‘what did we hear?’ (Hyman 2016, in press).

| | | | |
|-----------|-----------|-----------|-----------|
| class 9: | é-nèné | class 10: | é-nèné |
| class 11: | ò-lú-nèné | class 10: | é-nèné |
| class 12: | à-ká-nèné | class 14: | ò-bú-nèné |

Adjectives not only take the same noun class prefixes as nouns, but also show the same tone patterns—although certain derived patterns are more likely to show up in adjectives. The following tone patterns have been found, all cited with a class 7 è-cí- augment-prefix sequence:

| | | | | | | |
|------|---------|-------------|----------------|-------------|--------------|---------|
| (47) | L-H-L | è-cí-bì | ‘bad’ | è-cí-tò | ‘young’ | (n = 2) |
| | L-H-H-H | è-cí-káíré | ‘old (in age)’ | è-cí-tónó | ‘small’ | (n = 2) |
| | L-H-L-H | è-cí-nèné | ‘big’ | è-cí-gàzí | ‘wide’ | (n = 5) |
| | | è-cí-kàlú | ‘dry, empty’ | è-cí-yòndhó | ‘clean’ | |
| | | è-cí-cìdú | ‘nude’ | | | |
| | L-H-H-L | è-cí-yáákà | ‘new’ | è-cí-dáángà | ‘cross-eyed’ | (n = 2) |
| | | è-cí-lúúnjì | ‘good’ | | | |

While the above are some of the basic adjectives, quite a few more are derived from verbs (either now or once in the language). Some of these occur as nouns with special meanings. Those ending in *-e* refer to the object of the corresponding transitive verb. All take the same tone pattern, independent of the tone of the verb:

| | | | | | | | |
|------|--------------|-----------------|---|--------------|--------------------------|-------------|----------------|
| (48) | ò-kú-síb-á | ‘to tie’ | → | è-cí-síb-é | ‘sth. tied’ | ò-mú-síb-é | ‘prisoner’ |
| | ò-kú-mánh-á | ‘to know’ | → | ò-cí-mánh-é | ‘sth. known’ | ò-lú-mánh-é | ‘familiarity’ |
| | ò-kú-zààl-á | ‘to give birth’ | → | ò-cí-zààl-é | ‘sth. born’ | ò-bú-zààl-é | ‘birth(place)’ |
| | ò-kú-síimb-á | ‘to plant’ | → | è-cí-siimb-é | ‘sth. planted, a plant’ | | |
| | ò-kú-zíimb-á | ‘to build’ | → | è-cí-zìimb-é | ‘sth. built, a building’ | | |

As seen, the above derived adjectives and nouns have the same tone pattern with /L/ being assigned to the first mora of the stem. The same tone pattern is observed on adjectives and nouns derived from intransitive verbs with the ending *-u* which, except for *-CVC-* roots, labiodentalizes a preceding non-nasal consonant:

| | | | | | |
|------|------------------|-----------------------------|---|------------------|---------------------------|
| (49) | ò-kú-kàlá | ‘to become dry’ | → | è-cí-kàl-ú | ‘sth. dry, empty’ |
| | ò-kú-lám-á | ‘to recover from illness’ | → | ò-mú-làm-ú | ‘an alive, living person’ |
| | ò-kú-swáál-á | ‘to be ashamed’ | → | ò-mú-swààv-ú | ‘s.o. shameful’ |
| | ò-kú-támíír-á | ‘to become drunk’ | → | ò-mú-tàmìiv-ú | ‘s.o. drunk, a drunkard’ |
| | ò-kú-tàlàìg-á | ‘to become rusty’ | → | è-cí-tàlàìv-ú | ‘sth. rusty’ |
| | ò-kú-dáánkàán-á | ‘to become spoiled’ | → | è-cí-dàànkààn-ú | ‘sth. spoiled’ |
| | ò-kw-îrùgàl-á | ‘to become black’ | → | è-cí-îrùgàv-ú | ‘sth. black’ |
| | ò-kw-èè-tòòlól-á | ‘to be round’ ²⁶ | → | è-c-èè-tòòlòòv-ú | ‘sth. round’ |

As seen in the following examples deverbal adjectives ending in *-u* show the multiple L tone patterns that were problematic in nouns (§4.5, 4.7) suggesting a multiply linked L tone. A few follow a different tone pattern, *ò-kú-ból-á* ‘to become wet’ → *è-cí-ból-ú* ‘sth. wet’.

²⁶ This verb and its derivative have the reflexive prefix /-e-/.

When an adjective follows a noun its H tone(s) potentially spread onto the preceding noun. The following examples show both pre- and post-vowel coalescence tones with the adjectives /-tono/ ‘small’ (underlyingly toneless) and /-nène/ ‘big’:

- (50) a. ò-mú-límí ó-mú-tónó [ò-mú-límí’ óó-mú-tónó] ‘small farmer’
 b. ò-mú-límí ó-mú-nèné [ò-mú-límí’ óó-mú-tónó] ‘big farmer’
 c. ò-mú-kàzì ò-mú-tónó [ò-mú-kàzy’ òò-mú-tónó] ‘small woman’
 d. ò-mú-kàzì ò-mú-nèné [ò-mú-kàzy’ òò-mú-nèné] ‘big woman’

In (50a) the H% boundary tone spreads from the end of the phrase all the way up to the underlyingly toneless noun class prefix /-mu-/ of ‘farmer’. The initial augment is L since one L tone is required at the left edge, the effect of the initial %L boundary tone. In (50b) it is the inserted H preceding /-nène/ ‘big’ that spreads onto the noun. Such spreading is not observed in (50c), where H% reaches only into the toneless adjective ò-mú-tónó, or (50d), where H% links only to the last syllable of the adjective ò-mú-nèné. Similar facts are observed when the augment is not present:

- (51) a. mù-límí mú-tónó ‘he’s a small farmer’
 b. mù-límí mú-nèné ‘he’s a big farmer’
 c. mú-kàzì mù-tónó ‘she’s a small woman’
 d. mú-kàzì mú-nèné ‘she’s a big woman’

In (51a,b) the first syllable of *mù-límí* is L, as is the first syllable of *mù-tónó* in (51c). In (51c,d) -kàzì must remain L-L because of the two L tone requirement. Thus, neither spreading of the H% boundary tone or the H from the next word (51d) can reach the noun. (51c) shows that when it can, it must leave one L tone at the left edge of the word, in this case, the adjective *mù-tónó*. We can see this either as spreading of the final L from the noun onto the adjective, or as a constraint against the right-edge H% ever stopping at the left edge of a word. Other nouns with the same underlying tones show the same final L:

- (52) a. ò-mú-sàghò ò-mú-tónó ‘a small doctor’ cf. ò-mú-sàghó
 ò-mú-sòtà ò-mú-tónó ‘a small snake’ cf. ò-mú-sòtá
 è-cí-bàlì è-cí-tónó ‘a small swamp’ cf. è-cí-bàlì
 b. ò-mú-sàghò ò-mú-nèné ‘a big doctor’
 ò-mú-sòtà ò-mú-nèné ‘a big snake’
 è-cí-bàlì è-cí-nèné ‘a big swamp’

While such nouns are realized with a final H% tone in isolation, their final syllable does not become H by H tone spreading from the following adjective. This can be attributed to the same constraint seen in §2: If a word has a H-L sequence, it cannot receive a H from the next word unless it is preceded by two L tone moras. The following examples show that H tone spreading is observed on longer nouns which have two additional moras following the L-L sequence:

- (53) a. ò-mú-kààkálé ó-mú-tónó ‘a small castor oil plant’ cf. ò-mú-kààkálé
 à-má-lwààlíró á-má-tónó ‘small hospitals’ cf. à-má-lwààlíró
 è-cí-dììngídó é-cí-tónó ‘a small feast’ cf. è-cí-dììngídó

- | | | | | |
|----|---------------|-----------|--------------------------|-------------------|
| | é-n-sàlòòsáló | é-n-tónó | ‘a small boundary’ | cf. é-n-sàlòòsáló |
| b. | ò-mú-kààkálé | ó-mú-nèné | ‘a big castor oil plant’ | |
| | à-má-lwààlíró | á-má-nèné | ‘big hospitals’ | |
| | è-cí-diìngídó | é-cí-nèné | ‘a big feast’ | |

In each of the above examples, the long vowel of the stem-initial syllable satisfies the two L tone mora condition such that successive moras are allowed to become H. The one exception to this concerns noun stems of the shape CVVCV. While these should allow the final vowel to become H, it is instead realized L:

- | | | | | |
|---------|--------------|-----------|-------------------------|-----------------|
| (54) a. | ò-mú-sààdhà | ò-mú-tónó | ‘a small man’ corrected | cf. ò-mú-sààdhá |
| | è-cí-wùùkà | è-cí-tónó | ‘a small insect’ | cf. è-cí-wùùká |
| | è-cí-siìmbè | è-cí-tónó | ‘a small plant’ | cf. è-cí-siìmbé |
| b. | ò-mú-sààdhà | ò-mú-nèné | ‘a big man’ | |
| | è-cí-wùùkà | è-cí-nèné | ‘a big insect’ | |
| | è-cí-siìmb-è | è-cí-nèné | ‘a big plant’ | |

What the above examples seem to suggest is that H tone spreading will not occur if it can only reach the final syllable of the preceding noun. One can predict the pre-adjectival form of the noun in the following way:

- (i) If the isolation form ends in a single H (from H%), it will be realized L:

- | | | | | |
|---------|----------------|-----------|--------------------|--------------------|
| (55) a. | ò-mú-tàmìivù | ò-mú-tónó | ‘a small drunkard’ | cf. ò-mú-tààmìivú |
| | ò-mú-bààndìbwà | ò-mú-tónó | ‘a small debtor’ | cf. ò-mú-bààndìbwá |
| | è-cí-fàànàní | è-cí-tónó | ‘a small picture’ | cf. è-cí-fàànàní |
| | è-cí-táàngààlà | è-cí-tónó | ‘a small light’ | cf. è-cí-táàngààlá |
| b. | ò-mú-tàmìivù | ò-mú-nèné | ‘a big drunkard’ | |
| | ò-mú-bààndìbwà | ò-mú-nèné | ‘a big debtor’ | |
| | è-cí-fàànàní | è-cí-nèné | ‘a big picture’ | |
| | è-cí-táàngààlà | è-cí-nèné | ‘a big light’ | |

(ii) If the isolation form of the noun ends in more than one H, the same seequence of Hs will be observed before an adjective:

- | | | | | |
|---------|-------------------|-----------|----------------------|-----------------------|
| (56) a. | é-m-pwààpúló | é-n-tónó | ‘a small wild fruit’ | cf. é-m-pwààpúló |
| | è-bí-dòòmbóódó | é-bí-tónó | ‘small dregs’ | cf. è-bí-dòòmbóódó |
| | à-ká-wùùndówúúndó | à-ká-tónó | ‘a small bat’ | cf. à-ká-wùùndówúúndó |
| | è-cí-nhòmònghómó | é-cí-tónó | ‘a small sugar ant’ | cf. è-cí-nhòmònghómó |
| b. | é-m-pwààpúló | é-nèné | ‘a big wild fruit’ | |
| | è-bí-dòòmbóódó | é-bí-nèné | ‘big dregs’ | |
| | à-ká-wùùndówúúndó | à-ká-nèné | ‘a big bat’ | |
| | è-cí-nhòmònghómó | é-cí-nèné | ‘a big sugar ant’ | |

One interpretation of the above facts is that a single final H (from H%) is interpreted as if it is derived by replacing a phonological L, while the moras of a post-L sequence of Hs are phonologically toneless (Ø). Be this at it may, adjectives provide one of the most neutral and

transparent environments for tone: the only effect they can have is for their H tone to spread onto available toneless moras on the preceding noun. Most of the remaining modifiers affect the tone of the noun in more significant ways.

5.2. Possessive pronouns

Possessive pronouns agree in noun class with the noun they modify. The independent forms are given below for each class below as they appear without an augment, e.g. *è-cí-kópò cáàngé* ‘the cup is mine’, *ècí-kópò cìcò* ‘the cup is yours sg.’ (etc.):

| (57) | <i>n.cl.</i> | <i>‘mine’</i> | <i>‘yours sg.’</i> | <i>‘his/hers’</i> | <i>‘ours’</i> | <i>‘yours pl.’</i> | <i>‘theirs’</i> |
|------|--------------|---------------|--------------------|-------------------|---------------|--------------------|-----------------|
| | 1 | wáàngé | wùwô | wùwê | wáifé | wáimwé | wáibwé |
| | 2 | báàngé | bàbô | bàbê | báifé | báimwé | báibwé |
| | 3 | gwáàngé | gùgwô | gùgwê | gwáifé | gwáimwé | gwáibwé |
| | 4 | jáàngé | jìjô | jìjê | jáifé | jáimwé | jáibwé |
| | 5 | ryáàngé | rìryô | rìryê | ryáifé | ryáimwé | ryáibwé |
| | 6 | gáàngé | gàgô | gàgê | gáifé | gáimwé | gáibwé |
| | 7 | cáàngé | cìcô | cìcê | cáifé | cáimwé | cáibwé |
| | 8 | byáàngé | bìbyô | bìbyê | byáifé | byáimwé | byáibwé |
| | 9 | yáàngé | yìyô | yìyê | yáifé | yáimwé | yáibwé |
| | 10 | dháàngé | dhìdhô | dhìdhê | dháifé | dháimwé | dháibwé |
| | 11 | lwáàngé | lùlwô | lùlwê | lwáifé | lwáimwé | lwáibwé |
| | 12 | káàngé | kàkô | kàkê | káifé | káimwé | káibwé |
| | 13 | twáàngé | tùtwô | tùtwê | twáifé | twáimwé | twáibwé |
| | 14 | bwáàngé | bùbwô | bùbwê | bwáifé | bwáimwé | bwáibwé |
| | 15 | kwáàngé | kùkwô | kùkwê | kwáifé | kwáimwé | kwáibwé |
| | 16 | gháàngé | ghàghô | ghàghê | gháifé | gháimwé | gháibwé |
| | 17 | kwáàngé | kùkwô | kùkwê | kwáifé | kwáimwé | kwáibwé |
| | 18 | mwáàngé | mùmwô | mùmwê | mwáifé | mwáimwé | mwáibwé |
| | 20 | gwáàngé | gùgwô | gùgwê | gwáifé | gwáimwé | gwáibwé |
| | 22 | gáàngé | gàgô | gàgê | gáifé | gáimwé | gáibwé |

As can be seen, the forms for ‘yours sg.’ and ‘his/her’ differ from the others both in morphological structure and tone. One can propose the following abstract (and historical) structures, illustrated with class 3 /gu-/ agreement:

| | | | | |
|---------|--------------|---|-------------|---------------------------|
| (58) a. | /gu-à-ng-e/ | → | gw-á-à-ng-é | ‘mine’ |
| | /gu-à-ifu-e/ | → | gw-á-if-é | ‘ours’ |
| | /gu-à-imu-e/ | → | gw-á-imw-é | ‘yours pl.’ |
| | /gu-à-ibu-e/ | → | gw-á-ìbw-é | ‘theirs’ |
| b. | /gu-gu-ò/ | → | gù-gw-ô | ‘yours sg.’ ²⁷ |
| | /gu-gu-è/ | → | gù-gw-ê | ‘his/hers’ |

²⁷ Since /a/ drops out before another vowel, it would be equally possible to propose that the connective morpheme is present in the underlying representations: /gu-gu-à-ò/, /gu-gu-à-è/.

In (58a) we observe an overt connective morpheme *-a-* as will also be seen in ‘noun of noun’ constructions, e.g. *mú-tì gw-àà = Jééngà* ‘(it’s) Jenga’s tree’. All of the forms also have a final *-e* suffix.²⁸ In (58b) there is instead a reduplicated prefix, e.g. class 3 *gu-gu-* and no *-e* suffix. In (58a) I have proposed that the connective */-à-/* is underlyingly */L/* so that the prefix *gu-* will receive a H tone. The resulting *gú-à-* sequence is then realized [gwàà] in *gwààngé* ‘mine’, [gwáì] in the other pronouns, where intermediate *gwàì* shortens to become bimoraic. In (58b) the */L/* of */-ò-/* and */-è-/* causes the second *gu-* prefix to become H. Intermediate *gwóò* and *gwèè* become [gwô] and [gwê] by final vowel shortening.

Now consider the same pronouns as they are realized when the augment vowel is present:

| (59) | <i>n.cl.</i> | ‘mine’ | ‘yours sg.’ | ‘his/hers’ | ‘ours’ | ‘yours pl.’ | ‘theirs’ |
|------|--------------|-----------|-------------|------------|----------|-------------|-----------|
| | 1 | ó-wààngé | ó-wúwô | ó-wúwê | ó-wàìfé | ó-wàìmwé | ó-wàìbwé |
| | 2 | á-bààngé | á-bábô | á-bábê | á-bàìfé | á-bàìmwé | á-bàìbwé |
| | 3 | ó-gwààngé | ó-gúgwô | ò-gúgwê | ó-gwàìfé | ó-gwàìmwé | ò-gwàìbwé |
| | 4 | é-jààngé | é-jíjô | é-jíjê | é-jàìfé | é-jàìmwé | è-jàìbwé |
| | 5 | é-ryààngé | é-ríryô | é-ríryê | é-ryàìfé | é-ryàìmwé | é-ryàìbwé |
| | 6 | á-gààngé | á-gágô | á-gágê | á-gàìfé | á-gàìmwé | á-gàìbwé |
| | 7 | é-cààngé | é-cícô | é-cícê | é-càìfé | é-càìmwé | é-càìbwé |
| | 8 | é-byààngé | é-bíbyô | é-bíbyê | é-byàìfé | é-byàìmwé | é-byàìbwé |
| | 9 | é-yààngé | é-yíyô | é-yíyê | é-yàìfé | é-yàìmwé | é-yàìbwé |
| | 10 | é-dhààngé | é-dhídhô | é-dhídhê | é-dhàìfé | é-dhàìmwé | è-dhàìbwé |
| | 11 | ó-lwààngé | ó-lúlwô | ó-lúlwê | é-lwàìfé | ó-lwàìmwé | ó-lwàìbwé |
| | 12 | á-kààngé | á-kákô | á-kákê | á-kàìfé | á-kàìmwé | á-kàìbwé |
| | 13 | á-twààngé | ó-tútwô | ó-tútwê | ó-twàìfé | ó-twàìmwé | ó-twàìbwé |
| | 14 | ó-bwààngé | ó-búbwô | ó-búbwê | ó-bwàìfé | ó-bwàìmwé | ó-bwàìbwé |
| | 15 | ó-kwààngé | ó-kúkwô | ó-kúkwê | ò-kwàìfé | ó-kwàìmwé | ó-kwàìbwé |
| | 16 | á-ghààngé | á-ghághô | á-ghághê | á-ghàìfé | á-ghàìmwé | á-ghàìbwé |
| | 17 | ó-kwààngé | ó-kúkwô | ó-kúkwê | ó-kwàìfé | ó-kwàìmwé | ó-kwàìbwé |
| | 18 | ó-mwààngé | ó-múmwô | ó-múmwê | ó-mwàìfé | ó-mwàìmwé | ó-mwàìbwé |
| | 20 | ó-gwààngé | ó-gúgwô | ó-gúgwê | ó-gwàìfé | ó-gwàìmwé | ó-gwàìbwé |
| | 22 | á-gààngé | á-gágô | á-gágê | á-gàìfé | á-gàìmwé | á-gàìbwé |

There are again two tone patterns: (i) the second and third person singular pronouns have the tone pattern H-H-HL, while the tone of the remaining pronouns is H-L-H. These can be accounted for with a single modification. As seen in (60), again illustrated with class 3, when the augment is present the (first) *gu-* prefix has an underlying */L/* tone:

| | | | | |
|---------|-----------------------|---|--------------|-------------|
| (60) a. | <i>/o-gù-à-ng-e/</i> | → | ó-gw-àà-ng-é | ‘mine’ |
| | <i>/o-gù-à-ifu-e/</i> | → | ó-gw-à-if-é | ‘ours’ |
| | <i>/o-gù-à-imu-e/</i> | → | ó-gw-à-ìmw-é | ‘yours pl.’ |
| | <i>/o-gù-à-ibu-e/</i> | → | ó-gw-à-ìbw-é | ‘theirs’ |
| b. | <i>/o-gù-gu-ò/</i> | → | ó-gú-gw-ô | ‘yours sg.’ |

²⁸ The expected output **gwáìfwé* ‘ours’ is instead realized *gwáìfé*, since [fw] sequences are prohibited. While all cases of [f] are expected to occur in a [fu] sequence, in this case from earlier *-*itu-*, recent borrowings such as *è-cí-fàààní* ‘picture’ upset the pattern. One might therefore instead propose that the root for ‘our’ is */-if-/*.

/o-gù-gu-è/ → ó-gú-gw-ê 'his/hers'

In (60a) the augment receives as H tone since it immediately precedes a /L/ tone. The final H is from H%. In (60b) the augment similarly receives a H tone before the /L/ of the first *gu-* prefix, as does the second *gu-* prefix, since it precedes the /L/ of /-ò/ and /-è/. The intermediate representations ó-gù-gú-ò and ó-gù-gú-è become ó-gú-gú-ò and ó-gú-gú-è by HTP, followed by gliding of the /u/ in the final syllable. In other words, everything follows the general rules of the language once we assume that the (first) *gu-* prefix is /L/.

The tones of possessive pronouns take on a third pattern when modifying a preceding noun, where they all become L (with final H% if there is a second syllable to take it). The following illustrates these tones with class 8 nouns of different tonal shapes:

| | | | | |
|------------|---------------------|--------------------|--------------------|--------------------------|
| (61) | /e-bi-tabo/ 'books' | /e-bi-dèe/ 'bells' | /e-bi-siki/ 'logs' | /e-bi-diingido/ 'feasts' |
| 'my' | è-bí-tábó byààngé | è-bí-dè byààngé | è-bí-síkí byààngé | è-bí-diingídó byààngé |
| 'your sg.' | è-bí-tábó = byò | è-bí-déé = byò | è-bí-síkí = byò | è-bí-diingídó byò |
| 'his/her' | è-bí-tábó = byè | è-bí-déé = byè | è-bí-síkí = byè | è-bí-diingídó byè |
| 'our' | è-bí-tábó byàìfé | è-bí-dè byàìfé | è-bí-síkí byàìfé | è-bí-diingídó byàìfé |
| 'your pl.' | è-bí-tábó byàìmwé | è-bí-dè byàìmwé | è-bí-síkí byàìmwé | è-bí-diingídó byàìmwé |
| 'their' | è-bí-tábó byàìbwé | è-bí-dè byàìbwé | è-bí-síkí byàìbwé | è-bí-diingídó byàìbwé |

As seen in the first column, toneless nouns become L + all H before all six possessive pronouns. In case the noun has a H-L transition, the realizations depend on the possessive pronoun: In the case of 'your sg.' and 'his/her', which are monosyllabic, the whole noun becomes H except for the augment. If we again assume that the underlying representations of the pronominal roots are /-ò/ and /-è/, we have two choices. One is to propose derivations such as the following (which is presented as a series of steps):

| | | | | | | | | | |
|---------|---------|---|------|---|------|---|-------|---|------|
| (62) a. | /bi-ò-/ | → | bí-ò | → | byóò | → | ´byòò | → | ´byò |
| b. | /bi-è-/ | → | bí-è | → | byéè | → | ´byéè | → | ´byè |

As indicated, HTI assigns a H to the toneless class 7 prefix /bi-/. This is followed by gliding of the /i/ with compensatory lengthening of the following vowel. At this stage we have the HL tone of the final syllable of the independent pronouns in (57) and (59). The problem with this analysis is the next step where possessive pronouns delink their H tone when modifying a noun, as shown by the unlinked H tone. Final vowel shortening (FVS) will then apply if the possessive pronoun occurs at the right edge of a clitic group. Thus, contrast è-bí-tábó byò 'your sg. books' with bí-tábó 'byóó cì 'which book of yours', where byóó is realized with a long vowel.²⁹

An alternative is to assume as we did with augmented possessive pronouns in (60) that when modifying a noun, the noun class prefix is also L. This would produce derivations such as the following:

²⁹ The downstepped (´) H tone is due to HTI which assigns a H to the syllable that precedes -cì 'which'. In this case it is the pronoun which has its own /L/. Since class 8 byòò 'your sg.' is not part of the lexical word, it does not undergo L tone deletion (LTD), rather simply delinks its L. The sequence of H^L H is realized H-´H.

- (63) a. /e-bi-tabo = bì-ò/ → e-bí-tábó = bì-ò → è-bí-tábó = bì-ò
 /e-bi-tabo = bì-è/ → e-bí-tábó = bì-è → è-bí-tábó = bì-è
 b. /e-bi-dèe = bì-ò/ → e-bí-dèe = bì-ò → è-bí-déé = bì-ò
 /e-bi-dèe = bì-è/ → e-bí-dèe = bì-è → è-bí-déé = bì-è
 c. /e-bi-sìki = bì-ò/ → e-bí-sìkí = bì-ò → è-bí-síkí = bì-ò
 /e-bi-sìki = bì-e/ → e-bi-sìki = bì-e/ → è-bí-síkí = bì-è
 d. /e-bi-dìingido = bì-ò/ → e-bi-dìingido = bì-ò → è-bí-díingídó = bì-ò
 /e-bi-dìingido = bì-è/ → e-bi-dìingido = bì-è → è-bí-díingídó = bì-è

In each case the enclitic /= bì-ò/ or /= bì-è/ triggers HTI on what precedes. In (63a), where the noun is toneless, the H goes on all of the moras except the initial augment. In (63b-d) the H goes on the last syllable of the noun and then triggers LTD and HTP. What is crucial is that the H from HTI can override any Ls on the noun. This is quite different from H tone spreading (HTS) from the next word which, as seen from earlier examples such as (52) vs. (53), can only occur if at least two L tones are left on the targeted noun. This latter pattern is however also seen with the bisyllabic possessive pronouns in (61). The forms in (64) illustrate this with the first person singular pronoun ‘my’:

- (64) a. /e-bi-tabo bì-à-ng-e/ → e-bí-tábó bì-à-ng-e → è-bí-tábó byààngé
 b. /e-bi-dèe bì-à-ng-e/ → e-bí-dèe bì-à-ng-e → è-bí-dè byààngé
 c. /e-bi-sìki bì-à-ng-e/ → e-bí-sìki bì-à-ng-e → è-bí-sìki byààngé
 d. /e-bi-dìingido bì-à-ng-e/ → e-bí-dìingídó bì-à-ng-e → è-bí-dìingídó byààngé

That there is a H preceding *byààngé* is clearly seen in (64a), where it links to all but the augment of the toneless noun /e-bi-tabo/ ‘books’, and (64d), where it links to the last two (toneless) moras of /e-bi-dìingido/ ‘feasts’. In the latter case there is no LTD or HTP vs. the forms in (63b-d). This can be attributed to the fact that the monosyllabic possessive pronouns are enclitics, while the bisyllabic ones are not. One can see this in (61), where the vowel of the stem syllable of /e-bi-dèe/ ‘bells’ shortens before bisyllabic, but not monosyllabic possessive pronouns. The non-clitic status of bisyllabic possessive pronouns is also seen in (64c) where *byààngé* fails to assign a H to /è-bí-sìki/ ‘logs’, since the latter would then not meet the two L tone requirement. We have already seen that the assignment of the H% boundary tone has been able to override this constraint, possibly leaving behind a word that ends with a H-L-H sequence. The monosyllabic possessive enclitics can do likewise. However, unlike phrasal H%, in their case the H assigned by HTI enters onto the word which then cannot tolerate a H-L-H sequence. As a result LTI and HTP apply, as in (63b-d).

5.3. Demonstratives

Lusoga distinguishes three demonstratives indicating ‘this’ (near speaker), ‘that’ (near hearer), and ‘that’ (far from both speaker and hearer). These are fully marked for noun class:

- (65) *n.cl.* ‘this/these’ (n.s.) ‘that/those’ (n.h.) ‘that/those’ (far)
- | | | | |
|---|------|------|------|
| 1 | ònó | òyó | òlé |
| 2 | bàno | àbó | bàlé |
| 3 | gùnó | ògwó | gùlé |

| | | | |
|----|-------|------|-------|
| 4 | jìnó | èjọ́ | jìré |
| 5 | lìnó | èryó | lìré |
| 6 | gàno | àgó | gàlé |
| 7 | cìnó | ècọ́ | cìré |
| 8 | bìnó | èbyó | bìré |
| 9 | èno | èyọ́ | èré |
| 10 | dhìnó | èdhó | dhìré |
| 11 | lùnó | òlwó | lùlé |
| 12 | kàno | àkọ́ | kàlé |
| 13 | tùnó | òtwó | tùlé |
| 14 | bùnó | òbwó | bùlé |
| 15 | kùnó | òkwó | kùlé |
| 16 | ghàno | àghó | ghàlé |
| 17 | kùnó | òkwó | kùlé |
| 18 | mùnó | òmwo | mùlé |
| 20 | gùnó | ògwó | gùlé |
| 22 | gàno | àgó | gàlé |

The demonstrative stems in the first and last columns are clearly /-no/ ‘near speaker’ and /-le/ ‘far from speaker and hearer’. The structure of the ‘near hearer’ demonstrative is V-CV-*o*, where the initial vowel is identical to the augment and the CV represents the familiar concord prefixes seen on possessive pronouns, e.g. class 1 *ò-yi-o*, class 2 *à-ba-o*, class 3 *ò-gu-o* etc. Each of the above forms can also occur reduplicated with a more emphatic meaning, e.g. ‘this very one, this particular one’:

| (66) | <i>n.cl.</i> | <i>‘this/these’ (n.s.)</i> | <i>‘that/those’ (n.h.)</i> | <i>‘that/those’ (far)</i> |
|------|--------------|----------------------------|----------------------------|---------------------------|
| | 1 | ònóònó | òyóòyó | òlólólé |
| | 2 | bànoònó | àbáàbó | bàlébàlé |
| | 3 | gùnógùnó | ògwóògwó | gùlégùlé |
| | 4 | jìnójìnó | èjéèjọ́ | jìréjìré |
| | 5 | lìnólìnó | èryéèryó | lìrélìré |
| | 6 | gànoònó | àgáàgó | gàlégàlé |
| | 7 | cìnócìnó | ècèècọ́ | cìrécìré |
| | 8 | bìnóbìnó | èbyéèbyó | bìrébìré |
| | 9 | ènoònó | èyéèyọ́ | èréèré |
| | 10 | dhìnódhìnó | èdhéèdhó | dhìrédhìré |
| | 11 | lùnólùnó | òlwóòlwó | lùlélùlé |
| | 12 | kànoònó | àkáàkọ́ | kàlékàlé |
| | 13 | tùnótùnó | òtwóòtwó | tùlé |
| | 14 | bùnóbùnó | òbwóòbwó | bùlébùlé |
| | 15 | kùnókùnó | òkwóòkwó | kùlékùlé |
| | 16 | ghànoònó | àgháàghó | ghàléghàlé |
| | 17 | kùnókùnó | òkwóòkwó | kùlékùlé |
| | 18 | mùnómùnó | òmwoònwo | mùlé |
| | 20 | gùnógùnó | ògwóògwó | gùlégùlé |
| | 22 | gànoònó | àgáàgó | gàlégàlé |

As the above demonstrates, the three demonstratives have exactly the same tone. While the final H in both (65) and (66) can be attributed to the H% phrasal tone, the first H in (66) cannot. In fact, it is assigned by the second occurrence of the demonstrative. As seen in (67), these demonstratives regularly assign a H to the preceding noun except when the latter ends in a H-L sequence:

| (67) | | <i>'this' (n.s.)</i> | <i>'that' (n.h.)</i> | <i>'that' (far)</i> | |
|------|-----------|----------------------|----------------------|---------------------|------------|
| a. | H-L | é-m-bwà ènó | é-m-bwà èyó | é-m-bwà èré | 'dog' |
| | L-H-L | ò-mú-tì gùnó | ò-mú-tì ògwó | ò-mú-tì gùlé | 'tree' |
| | L-H-H-L | è-cí-kópò cìnó | è-cí-kópò ècó | è-cí-kópò cìré | 'cup' |
| b. | L-H | è-ì-gé lìnó | è-ì-gé èryó | è-ì-gé lìré | 'termite' |
| | L-H-H | ò-lú-mú lùnó | ò-lú-m.ú òlwó | ò-lú-mú lùlé | 'ringworm' |
| | L-H-H-H | ò-mú-límí ònó | ò-mú-límí òyó | ò-mú-límí òlé | 'farmer' |
| c. | H-L-H | é-n-kòkó ènó | é-n-kòkó èyó | é-n-kòkó èré | 'chicken' |
| | L-H-L-H | ò-mú-kàzì ònó | ò-mú-kàzì òyó | ò-mú-kàzé òlé | 'woman' |
| | L-H-L-L-H | ò-mú-tàmìivú ònó | ò-mú-tàmìivú òyó | ò-mú-tàmìivú òlé | 'drunkard' |
| d. | H-L-H-H | é-í-rwààlíró lìnó | é-í-rwààlíró èryó | é-í-rwààlíró lìré | 'hospital' |
| | L-H-L-H-H | è-cí-diìngídó cìnó | è-cí-diìngídó ècó | è-cí-diìngídó cìré | 'feast' |

In (67) the noun maintains the same tone before a demonstrative as it has in isolation. In (67a) there is no final H because the noun ends in H-L. The nouns in (67b) maintain their L + Hⁿ pattern, while those in (67c) also occur with one final H. Finally, the nouns in (67d) have a H to L drop, but regain a H on their final two syllables. These facts are strikingly different from those seen in noun + possessive pronoun sequences. Although both demonstratives and bisyllabic pronouns such as 'my' seem to assign a H to the preceding noun, the latter effect is less effective. As the comparison in (68a) shows, bisyllabic possessive pronouns do not assign a H to the preceding noun if it ends in two L tones.

| | | | | |
|---------|-----------------------|----------------|--------------------|-------------------|
| (68) a. | è-bí-sìkí byààngé | 'my logs' | è-bí-sìkí bìnó | 'these logs' |
| | é-n-kòkò dhààngé | 'my chickens' | é-n-kòkó dhìnó | 'these chickens' |
| b. | à-má-bààlé gààngé | 'my stones' | à-má-bààlé gànó | 'these stones' |
| | è-bí-wùùkà byààngé | 'my insects' | è-bí-wùùkà bìnó | 'these insects' |
| c. | é-m-pùlùkò yààngé | 'my souvenir' | é-m-pùlùkó ènó | 'this souvenir' |
| | è-cí-fàànàní cààngé | 'my picture' | è-cí-fàànàní cìnó | 'this picture' |
| | é-m-pòòngòlò yààngé | 'my cave' | é-m-pòòngòlò ènó | 'this souvenir' |
| | ò-bw-î̀nògòvù bwààngé | 'my coldness' | ò-bw-î̀nògòvù bùnó | 'this coldness' |
| d. | à-má-lwààlíró gààngé | 'my hospitals' | à-má-lwààlíró gànó | 'these hospitals' |
| | è-cí-diìngídó cààngé | 'my feast' | è-cí-diìngídó cànó | 'this feast' |

As seen to the right, demonstratives readily violate the constraint. Comparing the forms in (68b,c), the possessive pronoun 'my' (but not the demonstrative 'this') fails to assign a final H to certain nouns which otherwise would satisfy the two L tone constraint. These contrast with the nouns in (68d) which do receive the H from the possessive. There is a strong tendency in Lusoga for shorter noun stems not to accept a single final H syllable before the bisyllabic possessive pronouns (and other contexts we have seen above). As soon as there are more moras, there is a

contrast, as seen in comparing *è-cí-fàà̀nà̀nì* ‘picture’ in (68c) with *à-má-lwà̀lìrò* ‘hospitals’ in (68d). What this means is that some nouns end with L tone, while others end toneless. As was seen in §2, infinitives all end toneless, since they always take a H tone, including from possessives:

| | | | | | |
|------|----|------------------------|------------------|------------------------|---------------|
| (69) | a. | ò-kú-mw-á kwààngé | ‘my shaving’ | ò-kú-ly-à kwààngé | ‘my eating’ |
| | | ò-kú-gw-á kwààngé | ‘my falling’ | ò-kú-ty-à kwààngé | ‘my fearing’ |
| | b. | ò-kú-bál-á kwààngé | ‘my counting’ | ò-kú-bòn-à kwààngé | ‘my seeing’ |
| | | ò-kú-lím-á kwààngé | ‘my cultivating’ | ò-kú-tùm-à kwààngé | ‘my sending’ |
| | c. | ò-kú-nááb-á kwààngé | ‘my bathing’ | ò-kú-lè̀t-á kwààngé | ‘my bringing’ |
| | | ò-kú-fúúmbá kwààngé | ‘my cooking’ | ò-kú-tù̀k-á kwààngé | ‘my arriving’ |
| | d. | ò-kú-lágír-á kwààngé | ‘my commanding’ | ò-kú-ghù̀lìr-á kwààngé | ‘my hearing’ |
| | | ò-kú-sásúl-á kwààngé | ‘my feast’ | ò-kú-sè̀kùl-á kwààngé | ‘my pounding’ |
| | e. | ò-kú-súmúlúzó kwààngé | ‘my untying’ | ò-kú-kà̀lákátá kwààngé | ‘my scraping’ |
| | | ò-kú-gézésébwá kwààngé | ‘my perspiring’ | ò-kú-fù̀kámírá kwààngé | ‘my kneeling’ |

The verbs on the left are all toneless and become all H except for the initial augment vowel *ò-*. Those on the right have an underlying /L/ root which requires that the preceding infinitive prefix /-ku-/ become H. The possessive does not assign a H to the /L/ verbs in (69a), since they end H-L. The verbs in (69b) also do not receive a final H, since that would violate the two L tone requirement. The longer verbs in (69c-d) all successfully receive a H from the possessive. To appreciate the difference with non-infinitive nouns, compare the L-H-L-H realization of the infinitives in (69c) with the L-H-L-L realization of the nouns in (68b), e.g. *ò-kú-lè̀t-á kwààngé* ‘my bringing’ vs. *à-má-bà̀lè̀ gààngé* ‘my stones’. From this we can conclude that the infinitive final vowel /-a/ is toneless, while all of noun stems such as *-baale* end with a L.

Before moving on to numerals, it should be pointed out that all demonstratives can be used without a head noun, e.g. *òró* ‘this one’ (class 1), *èbyó* ‘those (ones)’ (n.h.) (class 7), *lùlè* ‘that one’ (far) (class 11). When they do, they assign their H tone to whatever precedes. Thus, a preceding verb will have exactly the same tone as it has in isolation with the final boundary H% tone. This is illustrated after the infinitive, the present habitual and distant past tenses in (70), where the plural demonstrative ‘these (ones)’ is illustrated in class 2 (*bà̀nó*) and class 7 (*bì̀nó*). The verb roots on the left are underlyingly toneless, while those on the right have a root-initial /L/:

| | | | | | |
|------|-------------------|----------------------|----------------------|-----------------------|--------------------|
| (70) | INF | ò-kú-mw-á bà̀nó | ‘to shave these’ | ò-kú-ly-à bì̀nó | ‘to eat these’ |
| | | ò-kú-bál-á bì̀nó | ‘to count these’ | ò-kú-kù̀b-á bì̀nó | ‘to beat these’ |
| | | ò-kú-lágír-á bà̀nó | ‘to command these’ | ò-kú-ghù̀lìrá bà̀nó | ‘to hear these’ |
| | | ò-kú-súmúlúz-á bì̀nó | ‘to untie these’ | ò-kú-kà̀lákát-á bì̀nó | ‘to scrape these’ |
| | HAB | à-mw-á bà̀nó | ‘he shaves these’ | á-ly-à bì̀nó | ‘he eats these’ |
| | | à-bál-á bì̀nó | ‘he counts these’ | á-kù̀b-á bì̀nó | ‘he beats these’ |
| | | à-lágír-á bà̀nó | ‘he commands these’ | á-ghù̀lìr-á bà̀nó | ‘he hears these’ |
| | | à-súmúlúz-á bì̀nó | ‘he unties these’ | á-kà̀lákát-á bì̀nó | ‘he scrapes these’ |
| | PAST ₃ | y-á-mw-à bà̀nó | ‘he shaved these’ | y-á-ly-à bì̀nó | ‘he ate these’ |
| | | y-á-bà̀l-á bì̀nó | ‘he counted these’ | y-á-kù̀b-á bì̀nó | ‘he beat those’ |
| | | y-á-là̀gìr-á bà̀nó | ‘he commanded those’ | y-á-ghù̀lìr-á bà̀nó | ‘he heard those’ |
| | | y-á-sùmù̀lù̀zò bì̀nó | ‘he untied those’ | y-á-kà̀lákà̀t-á bì̀nó | ‘he scraped those’ |

Once again, the demonstrative H assignment works differently from bisyllabic possessive pronouns which fail to assign a H to the preceding noun unless the two L tone constraint is met.

5.4. Numerals

The numerals one through ten are given in (71) as they appear in counting:

| | | | | |
|------|----------|---------|-----------|---------|
| (71) | ̀n-dá lá | ‘one’ | mú-kààgá | ‘six’ |
| | ̀i-bìrì | ‘two’ | mù-sáánvú | ‘seven’ |
| | ̀i-sàtú | ‘three’ | mú-náánà | ‘eight’ |
| | ̀ì-nâ | ‘four’ | mw-éèndá | ‘nine’ |
| | ̀i-tàànú | ‘five’ | í-kùmí | ‘ten’ |

Although a noun class prefix has been separated by a hyphen in each of the above forms, only the numbers one through five actually agree in noun class.

| | | | | | | |
|------|-------|-----------|---------|---------|--------|----------|
| (72) | n.cl. | ‘one’ | ‘two’ | ‘three’ | ‘four’ | ‘five’ |
| | 1 | mù-lá lá | | | | |
| | 2 | | bà-bìrì | bà-sàtú | bà-nâ | bà-tàànú |
| | 3 | mù-lá lá | | | | |
| | 4 | | è-bìrì | è-sàtú | è-nâ | è-tàànú |
| | 5 | ̀i-lá lá | | | | |
| | 6 | | à-bìrì | à-sàtú | à-nâ | à-tàànú |
| | 7 | cì-lá lá | | | | |
| | 8 | | bì-bìrì | bì-sàtú | bì-nâ | bì-tàànú |
| | 9 | ̀n-dá lá | | | | |
| | 10 | | ̀i-bìrì | ̀i-sàtú | ̀i-nâ | ̀i-tàànú |
| | 11 | ̀lù-lá lá | | | | |
| | 12 | kà-lá lá | | | | |
| | 13 | | tù-bìrì | tù-sàtú | tù-nâ | tù-tàànú |
| | 14 | bù-lá lá | bù-bìrì | bù-sàtú | bù-nâ | bù-tàànú |

As seen, the numeral ‘1’ occurs only with singular noun classes, while the numerals ‘2-5’ occur only in plural noun classes.

With respect to tone, the numerals show the following patterns:

| | | | | |
|------|--------------------|------------------|--------------------|------------------------|
| (73) | ‘farmer(s)’ | ‘tree(s)’ | ‘woman/women’ | ‘feast(s)’ |
| 1 | ò-mú-límí mú-lá lá | ò-mú-tì mù-lá lá | ò-mú-kàzì mù-lá lá | è-cí-diìngídó cí-lá lá |
| 2 | à-bá-límí bà-bìrì | è-mí-tì è-bìrì | à-bá-kàzì bà-bìrì | è-bí-diìngídó bì-bìrì |
| 3 | à-bá-límí bà-sàtú | è-mí-tì è-sàtú | à-bá-kàzì bà-sàtú | è-bí-diìngídó bì-sàtú |
| 4 | à-bá-límí bá-nâ | è-mí-tì è-nâ | à-bá-kàzì bà-nâ | è-bí-diìngídó bí-nâ |
| 5 | à-bá-límí bà-tàànú | è-mí-tì è-tàànú | à-bá-kàzì bà-tàànú | è-bí-diìngídó bì-tàànú |
| 6 | à-bá-límí mú-kààgá | è-mí-tì mú-kààgá | à-bá-kàzì mú-kààgá | è-bí-diìngídó mú-kààgá |

| | | | | |
|----|---------------------|-------------------|---------------------|-------------------------|
| 7 | à-bá-límí mú-sáánvú | è-mí-tì mù-sáánvú | à-bá-kàzì mù-sáánvú | è-bí-dìingídó mú-sáánvú |
| 8 | à-bá-límí mú-náánà | è-mí-tì mú-náánà | à-bá-kàzì mú-náánà | è-bí-dìingídó mú-náánà |
| 9 | à-bá-límí mw-éèndá | è-mí-tì mw-éèndá | à-bá-kàzì mw-éèndá | è-bí-dìingídó mw-éèndá |
| 10 | à-bá-límí í-kùmí | è-mí-tì í-kùmí | à-bá-kàzì í-kùmí | è-bí-dìingídó í-kùmí |

As seen in these forms, ‘tree(s)’ and ‘woman/women’ always end L before a numeral: H cannot be anticipated onto ‘tree(s)’ since it ends H-L, nor onto ‘woman/women’, since this would violate the two L tone requirement. On the other hand, toneless nouns such as ‘farmer(s)’ are realized with L on their augment, followed by all H tone, exactly as in citation form. In the case of the numerals 6 and 8-10, the Hs are likely from H tone anticipation, as these numerals have a phonological /L/ which triggers H tone insertion: /mu-kàaga/ ‘6’, /mu-naana/ ‘8’, /i-kùmí/ ‘10’. The numeral ‘7’ is itself toneless, so the H% can spread through it onto ‘farmers’. This leaves the numerals 1-5 which all start L. The numeral ‘1’ is underlyingly toneless. The numerals 2, 3 and 5 have an initial /L/ which is required to double: /bà-bìli/, /bà-sàtu/, /bà-tàanu/. As seen from ‘four farmers’ and ‘four feasts’, the numeral 4 appears to be toneless, i.e. /ba-naà/, since the H can originate from the stem. This contrasts with its apparent /L/ in (74).

While numerals generally lack an augment in normal attributive (post-nominal) position, when they do take an augment, adding a meaning of definiteness, the tones are as follows:

| | | | | |
|------|------------|----------------|-------------|-------------|
| (74) | ò-mú-lálá | ‘one, the one’ | ò-mú-kààgá | ‘the six’ |
| | á-bà-bìrì | ‘the two’ | ò-mú-sáánvú | ‘the seven’ |
| | á-bà-sàtú | ‘the three’ | ò-mú-náánà | ‘the eight’ |
| | á-bá-nâ | ‘the four’ | ò-mw-éèndá | ‘the nine’ |
| | á-bà-tàànú | ‘the five’ | é-í-kùmí | ‘the ten’ |

As seen, the toneless augment is realized L on the numerals ‘1’ and ‘6-9’. It also would have been realized H on the numeral ‘10’ except that it becomes H to avoid a rising tone on *è-í. While the prefix on ‘4’ was said to be toneless in (73), *á-bá-nâ* appears to require the prefix to be /L/. Thus, /a-bà-naà/ first becomes *á-bà-nâá* by HTI, and then *á-bá-nâ* by HTP (and final vowel shortening).

Of interest is how higher numbers are formed. As seen in (75), the noun class often changes, but without any modification of the tones:

| | | | | | | | | | | |
|------|-----------|------|----------|-------|-----------|----------|--------|-------------------------|---------|---------|
| (75) | ì-bìrì | ‘2’ | à-bìrì | ‘20’ | bí-kùmí | bì-bìrì | ‘200’ | ń-kùmì | ì-bìrì | ‘2000’ |
| | ì-sàtú | ‘3’ | à-sàtú | ‘30’ | bí-kùmí | bì-sàtú | ‘300’ | ń-kùmì | ì-sàtú | ‘3000’ |
| | ì-nâ | ‘4’ | à-nâ | ‘40’ | bí-kùmí | bì-nâ | ‘400’ | ń-kùmì | ì-nâ | ‘4000’ |
| | ì-tàànú | ‘5’ | à-tàànú | ‘50’ | bí-kùmí | bì-tàànú | ‘500’ | ń-kùmì | ì-tàànú | ‘5000’ |
| | mú-kààgá | ‘6’ | ń-kààgá | ‘60’ | lú-kààgá | | ‘600’ | ká-kààgá | | ‘6000’ |
| | mù-sáánvú | ‘7’ | ń-sáánvú | ‘70’ | lù-sáánvú | | ‘700’ | kà-sáánvú | | ‘7000’ |
| | mú-náánà | ‘8’ | cí-náánà | ‘80’ | lú-náánà | | ‘800’ | ká-náánà | | ‘8000’ |
| | mw-éèndá | ‘9’ | c-éèndá | ‘90’ | lw-éèndá | | ‘900’ | k-éèndá | | ‘9000’ |
| | í-kùmí | ‘10’ | cí-kùmí | ‘100’ | lú-kùmí | | ‘1000’ | mú-twààló ³⁰ | | ‘10000’ |

³⁰ Unlike Luganda, Lusoga does not use the expected form *ká-kùmí*. 100,000 is expressed as *mí-twààlò íkùmí* (lit. ten ten-thousands). Higher numbers include *kà-kátré* ‘1,000,000’ (cf. *bù-kátré* *bù-bìrì* ‘2,000,000’) and *ká-sìrìvù* ‘billion’ (cf. *bù-sìrìvù* *bù-bìrì* ‘two billion’).

What the above shows is that the words formed with the stems ‘2-5’ are numerals potentially agreeing with the head noun, which can be the base-10 word, e.g. 20 = ‘two tens’ (from *má-kùmì à-bìrì*, class 6, where *má-kùmì* ‘tens’ is optional), 200 = ‘two hundreds’ (class 8), 2000 = ‘two thousands’ (class 10). On the other hand, words formed with the stems ‘6-10’ are nouns which do not agree, but do change their noun class to form different powers of ten. Other numbers are formed by concatenation, without any remarkable tonal changes, e.g. *í-kùmì nà ñ-dálá* ‘11’, *í-kùmì nà ì-bìrì* ‘12’ etc. (The prefix of *ì-nâ* ‘4’ and *à-nâ* ‘forty’ is exceptionally long.)

5.5. Other quantifiers and determiners

In this brief section I consider a few other nominal modifiers. The first of these, *bùlì* ‘every, each’, precedes the noun:

- (76) a. *bùlì mù-límí* ‘every farmer’
bùlì mú-kàzí ‘every woman’
bùlì cí-kópò ‘every cup’
 b. *bùlì bà-límí* ‘each group of farmers’
bùlì bá-kàzí ‘each group of women’
bùlì bí-kópò ‘each set of cups’

Used with a singular noun, the meaning is ‘every’ or ‘each’. When used with a plural or a mass or liquid noun, the meaning is ‘each group’ or ‘each type’ (cf. class 6 *bùlì má-àdhí* ‘every type of water’). As seen, the following noun occurs with its citation tones, but without its augment. If the noun begins with a H tone prefix, this H does not spread onto *bùlì*. However, *bùlì* assigns a H tone to the preceding word exactly like a demonstrative:

- (77) a. *ò-kú-mw-á* *bùlì mù-límí* ‘to shave every farmer’
ò-kú-bál-á *bùlì mù-límí* ‘to count every farmer’
ò-kú-lágír-á *bùlì mù-límí* ‘to command every farmer’
ò-kú-súmúlú-á *bùlì mù-límí* ‘to untie every farmer’
 b. *ò-kú-ty-à* *bùlì mù-límí* ‘to fear every farmer’
ò-kú-bòn-á *bùlì mù-límí* ‘to see every farmer’
ò-kú-ghùlìr-á *bùlì mù-límí* ‘to hear every farmer’
ò-kú-kàlàkát-á *bùlì mù-límí* ‘to scrape every farmer’

In (77a) the toneless infinitives have a L followed by all H tone. In (77b) only the monosyllabic /L/ verb stem doesn’t receive a H tone (cf. *ò-mú-tì gùnó* ‘this tree’). As in the case of demonstratives, *ò-kú-bòn-á bùlì mù-límí* receives a H in violation of the two L tone constraint (cf. *ò-mú-sòtá gùnó* ‘this snake’).

The other modifiers follow the noun. These include the modifiers ‘only’ and ‘all/whole’, which can combine with personal persons and occur in all noun classes, as in (78).

- (78) n.cl. ‘only’ ‘all/whole’ ‘many’ independent pronouns
 1 *zèènkâ* *zénázénà* 1sg. *ññzé* ‘me’
wèènkâ *wénáwénà* 2sg. *ìwé* ‘you sg’

stem, the noun becomes all H except for the initial syllable: mù-límí =cì ‘which farmer?’. When the preceding noun has an underlying /L/, the following outputs are observed:

| | | | | | | | |
|------|--------------------------------|---------------------------------|---|------------|---|-----------------------------|----------------------|
| (80) | σ | /L/ | : | mú-tì | → | mú- ⁴ tí =cì | ‘which tree?’ |
| | σ - σ | /L- \emptyset / | : | mú-kàzì | → | mú-kàzí =cì | ‘which woman?’ |
| | | / \emptyset -L/ | : | bí-kópò | → | bí-kó ⁴ pó =cì | ‘which cups?’ |
| | σ : σ | /L \emptyset - \emptyset / | : | cí-wùùka | → | cí-wùùká =cì | ‘which insect?’ |
| | | / \emptyset L- \emptyset / | : | ká-sáàlè | → | ká-sáàlé =cì | ‘which arrow?’ |
| | | / $\emptyset\emptyset$ -L/ | : | cí-déédè/ | → | cí-déé ⁴ dé =cì | ‘which grasshopper?’ |
| | σ - σ - σ | /L- \emptyset - \emptyset / | : | bú-thùpùzi | → | bú-thùpùzí =cì | ‘which corruption?’ |
| | | / \emptyset -L- \emptyset / | : | mú-pákàsì | → | mú-pákàsí =cì | ‘which porter?’ |
| | | / \emptyset - \emptyset -L/ | : | bú-vúbúkà/ | → | bú-vúbú ⁴ ká =cì | ‘which adolescence?’ |

As can be seen, =cì assigns a H tone to the preceding noun in all cases. When the noun ends H-L, the result is a downstepped H (from the H-LH sequence); in other cases the nouns end H. As also seen, =cì does not condition HTP the way that monosyllabic possessive enclitics do (cf. (61) above). As seen in (81), enclitics potentially produce multiple downsteps in sequence:

| | | | | | | | | | | | | | |
|------|--|------|----------|------|-------|--------|---|--------|--------------------|--------------------|-------------------|------|--------|
| (81) | a-ta-a | =muu | =kuu | =cii | buli | lunaku | → | á-tá-á | = ⁴ múú | = ⁴ kúú | = ⁴ cí | bùli | lúnàkú |
| | ⊥ | ⊥ | ⊥ | ⊥ | ⊥ | ⊥ | | | | | | | |
| | H L | H L | H L | H L | H L | H L | | H L | H % | | | | |
| | s/he-puts | in | a.little | what | every | day | | | | | | | |
| | ‘what does s/he put a little of in every day?’ | | | | | | | | | | | | |

In (81) only HTI from the first enclitic /=mùu/ ‘in’ conditions HTP with its lexical host, while the the HTI triggered by /=kù/ ‘a little’, /=cii/ ‘which’ and /bùli/ ‘every’ produces a downstep with the preceding /L/. (81) also shows that each monosyllabic enclitic is underlyingly bimoraic, just like other monosyllabic stems (e.g. nouns, adjectives).

This completes the survey of noun modifiers.

6. Summary and conclusion

In the preceding sections the various tonal properties of nouns and noun modifiers were examined. While the above survey is certainly not complete (we have not considered ‘noun of noun’ constructions marked by the connective /-a/, for instance), it is representative of what is found in the language. Specifically, it has been firmly established that an analysis with a privative /L/ vs. \emptyset contrast is not only viable, but preferable to a synchronic analysis that takes an underlying /H/ through the diachronic stages that have produced current Lusoga. As seen in many of the above examples, a L (or sequence of Ls) triggers H tone insertion (HTI) within words, clitic groups and phrases. Of particular interest is the rather impressive range of conditions on HTI placed by different constructions. There are at least four distinct cases affecting head nouns:

- (82) a. HTI on all nouns with HTP: H enclitics ‘your sg.’, ‘his/her’ (61)
- b. HTI on all nouns without HTP: enclitic /=cì/ ‘which’ (81)
- c. HTI on nouns only if at least one L still precedes: /-ìno/ ‘this, these’ etc. (67)

- d. HTI on nouns only if they end in Ø: ‘my’ + noun (61), 68)

Although beyond the scope of this study, there are similar distinctions involving verbs and other constituents in full sentences (cf. Hyman 2016). A full study of the verb tones has also been untaken and will be reported on soon. The various parts of the verbal paradigm provide both confirmation of the general approach taken to noun phrase tonology, but also some additional issues. Since I began with the affirmative infinitive tones, let me conclude by briefly considering the corresponding negative forms.

As is common in Eastern Bantu, the negative infinitive is not marked by class 15 *ku-*, but rather by class 14 *bu-*, which is immediately followed by the negative prefix *-ta-*:

| (83) | *L root | | *H root | |
|------|--------------------------|---------------------------|-------------------------|----------------------------|
| 1σ | ó-bú-tá-gw-â | ‘to not fall’ | ó-bù-tà-ty-á | ‘to not fear’ |
| | ó-bú-tá-mw-â | ‘to not shave’ | ó-bù-tà-ly-á | ‘to not eat’ |
| 2σ | ó-bú-tá-bál-à | ‘to not count’ | ó-bù-tà-bòn-á | ‘to not see’ |
| | ó-bú-tá-lím-à | ‘to not cultivate’ | ó-bù-tà-kùb-á | ‘to not beat’ |
| 3σ | ó-bú-tá-lágìr-á | ‘to not command’ | ó-bù-tà-ghùlìr-á | ‘to not hear’ |
| | ó-bú-tá-lúmùk-á | ‘to not run away’ | ó-bù-tà-sèkùl-á | ‘to not pound’ |
| | ó-bú-tá-súmùlùl-á | ‘to not untie’ | ó-bù-tà-kàlàkàt-á | ‘to not scrape’ |
| | ó-bú-tá-kálìrìr-á | ‘to not grill’ | ó-bù-tà-fùkàmìr-á | ‘to not kneel’ |
| 5σ | ó-bú-tá-lágìr-àgàn-á | ‘to not command e.o.’ | ó-bù-tà-ghùlìr-àgàn-á | ‘to not hear each other’ |
| | ó-bú-tá-súmùlùl-ìr-á | ‘to not untie for (s.o.)’ | ó-bù-tà-kàlàkàt-ìr-á | ‘to not scrape for (s.o.)’ |
| | STEM = HL ⁿ H | | STEM = L ⁿ H | |

In order to produce the observed tone patterns, we need the L tones to be distributed as follows (to which the H% boundary tone will later link to the final vowel):

| | | | | |
|---------|---|----------------|---|-----------------|
| (84) a. | ó-bù-tà-súmùlùl-à | ‘to not untie’ | ó-bù-tà-kàlàkàt-à | ‘to not scrape’ |
| | $\begin{array}{c} \quad \quad \diagdown \\ \text{L} \quad \text{L} \quad \text{L}^* \end{array}$ | | $\begin{array}{c} \quad \quad \quad \diagdown \\ \text{L} \quad \text{L} \quad \text{L} \quad \text{L}^* \end{array}$ | |
| b. | ó-bù-tà-súmùlùl-à | ‘to not untie’ | ó-bù-tà-kàlàkàt-à | ‘to not scrape’ |
| | $\begin{array}{c} \vdots \quad \quad \quad \vdots \quad \diagdown \\ \text{H} \quad \text{L} \quad \text{L} \quad \text{H} \quad \text{L}^* \end{array}$ | | $\begin{array}{c} \vdots \quad \quad \quad \quad \diagdown \\ \text{H} \quad \text{L} \quad \text{L} \quad \text{L} \quad \text{L}^* \end{array}$ | |
| c. | ó-bú-tá-súmùlùl-à | ‘to not untie’ | ó-bù-tà-kàlàkàt-à | ‘to not scrape’ |
| | $\begin{array}{c} \quad \quad \quad \quad \diagdown \quad \diagdown \\ \text{H} \quad \text{L} \quad \text{L} \quad \text{H} \quad \text{L}^* \quad \text{H}\% \end{array}$ | | $\begin{array}{c} \quad \quad \quad \quad \diagdown \quad \diagdown \\ \text{H} \quad \text{L} \quad \text{L} \quad \text{L} \quad \text{L}^* \quad \text{H}\% \end{array}$ | |
| | $\begin{array}{c} \downarrow \quad \downarrow \\ \emptyset \quad \emptyset \end{array}$ | | | |

In both forms in (84a) the prefix *bù-* is L, despite noun prefixes being toneless in general. This is required to get the augment to be H tone [ó-] by HTI. The negative prefix is also /L/. This is best seen in the form on the right: If /-tà-/ had been toneless, the /L/ verb /-kàlakat-/ would have assigned a H to it by HTI. Finally, there is a need for a suffixal or “melodic” L tone marked as L*. As indicated, the suffixal L links from the second mora to the final vowel of the verb stem. In (84b), HTI inserts a H onto the augment, due to the L of /bù-/. In the form in the

left, HTI also inserts a H tone onto the toneless initial mora of /-sumulul-/. The fact that this form now has two inserted H tones leads to the deletion of the intervening Ls and HTP in (84c), where the final H% boundary tone also delinks the final L on both forms. Other verb forms show a wide range of tonal interactions between the prefixal, root, and suffixal tones assigned by various combinations of tense, aspect, mood, polarity and clause type—as elsewhere in Bantu (see the Bickmore & Odden 2014 and the references cited therein). While this raises further interesting issues and requires a few tweaks here and there, the above /L/ vs. Ø analysis can be shown to handle all of the facts as well or better than alternative interpretations of the Lusoga tone system. Herewith a promissory note to provide such a demonstration in the (hopefully) near future.

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