

NOMINAL TONE IN ISINDEBELE

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IsiNdebele is a Nguni Bantu language spoken in South Africa. While the tone systems of many other Nguni languages are well described and analysed, this paper presents the first description of the isiNdebele nominal tone system. The isiNdebele tone system is typical of Bantu languages in that Low tones are the default tones, added after phonological rules have been applied, and only High tones undergo any phonological rules. It is well known in the literature of Nguni languages that H tone spread/shift targets the antepenultimate and penultimate syllables, but isiNdebele differs from other Nguni languages in that the H tone spreading/shifting target is one syllable further, that is, the penultimate and the final syllable.

1. INTRODUCTION

Tones of Nguni languages have attracted the attention of phonologists for decades, and the tone systems of several Nguni languages are well described (see, e.g. Cassimjee & Kisseberth 2001; Cloughton 1992; Cope 1970; Donnelly 2009; Jokweni 1995; Khumalo 1987; Rycroft 1980b; 1983; Sibanda 2004). In addition, Nguni tone systems have inspired the development of phonological theories (see, e.g. Cassimjee 1998; Cassimjee & Kisseberth 1998; Downing 1990; 2001a; 2001b; 2009; Goldsmith, Peterson & Drogo 1989). While isiNdebele tones are mentioned in passing in relation to other Nguni languages, a comprehensive account of the isiNdebele tone system remains to be written. This paper addresses this gap by presenting a description of the isiNdebele nominal tone system.

IsiNdebele has a typical Bantu privative tone system (Hyman 2001). That is, only High (H) tones are involved in tone rules, while Low (L) tones are the default tones on any tone bearing units that do not have a H tone. IsiNdebele makes use of both lexical and grammatical tones. Lexical tone, the topic of this paper, is a lexical property of both noun and verb stems. In addition to lexical tones, nouns can have another underlying H tone, namely, the H tone of the augment or pre-prefix (see Miestamo, Helenius & Kajala in this volume). Grammatical tones are part of verbal inflection and not discussed in this paper.

The data presented in this paper has been collected by our project team during several visits to South Africa during 2014–2017,¹ and partly during the HALS fieldwork excursion in 2016 (see Introduction to this volume).² Therefore, the data covers a rather large part of the Ndebele area. Altogether, 240 nominal stems were recorded and transcribed in different contexts with up to ten speakers each. In this sample, there are about 30 monosyllabic stems, 100 bisyllabic stems, 50 trisyllabic stems, and 60 4-syllabic stems. The sample was constructed so that it covers cognates for all tone types in Proto-Bantu and includes depressor consonants, that is, consonants that have lowering effects on tones, in different positions in the stem.

The paper is organized as follows. Section 2 outlines the basics of the isiNdebele tone system. Since bisyllabic stems form the core of the nominal system, these are presented first in Section 3. Then monosyllabic noun stems (Section 4) and longer noun stems (Section 5) are presented. Only monomorphemic stems are treated in this paper because there are further processes affecting the tonal realizations in compound, derived, and reduplicated stems that fall out of the scope of this paper. In the final section (6), the isiNdebele tone patterns are compared to Zimbabwean Ndebele and isiZulu nominal tone patterns.

2. ISINDEBELE TONES

Nguni languages typically show spreading and/or shifting of H tones towards the end of the word (or even the phrase/utterance) (Cassimjee & Kisseberth 2001). IsiNdebele is no exception to this, as H tones undergo High Tone Spread or Shift (HTS), depending on the context. In this paper spreading and shifting are both analysed as spreading, but in the latter process the H tone is delinked from the original Tone Bearing Unit (TBU) after spreading (Zerbian & Barnard 2008: 242–243). IsiNdebele prefix H tones are not delinked from the TBU contributing the H tone, but with stem tones the delinking is optional.

IsiNdebele differs from the other Nguni languages in that the target of the HTS is one mora further to the right. A H tone contributed by any syllable before the ante-penult (pre-APU) targets the penult while H tones contributed by ante-penult (APU) or the penultimate syllable (PU) target the final, whereas

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other Nguni languages typically target the ante-penult and the penult (Cassimjee & Kisseberth 2001; see Section 6 for comparison). In isiNdebele, the final syllable is excluded as the target when in utterance-final position.

Surface H tones are marked with an accent in this paper, and underlying H tones are marked with underlining of the vowel contributing the H tone. Underlyingly toneless vowels as well as vowels that receive the default surface tone (L) are not marked. The left edge of the verb stem is marked with “[” to show whether the vowel contributing the H tone is in the prefix or the stem. The TBU is most often the vowel, but syllabified nasals can also bear tone in some contexts, for example with noun class 10 prefix (see page 296 below). Lengthened vowels are represented as double vowels.

HTS is first exemplified here with verb forms that typically have more syllables than the most common nouns and therefore show the spreading effects more clearly. Verb stems have a binary lexical tone contrast between H-toned and toneless stems. In these examples, penultimate syllables have long vowels indicating utterance-final position (the utterance-medial forms are presented with the noun stems below). If the H is contributed by the antepenultimate (APU) or the penultimate (PU) stem syllable, the PU syllable is realized with a level H tone (1a&b). If the H is contributed by a pre-APU syllable, which can be either a stem tone (2a) or a prefix tone (2b&c), the PU is realized with a falling tone.

- (1a) *sí[tjélíile* ‘we told’
- (1b) *siya[tjééla* ‘we tell’
- (2a) *sí[sikéliile* ‘we cut for’
- (2b) *úku[hlékiisa* ‘to make laugh’
- (2c) *bá[fikiséene* ‘they arrived together’

A H tone contributed by a pre-APU syllable targets the penult, and the result is a falling tone on the long PU, as seen in (2a–c) above. Level H on the PU is created when the H tone is contributed by the APU or the PU stem syllable, as in (1a&b) above (see Section 3 for a more detailed discussion). In (1a) and (2a) the stem tone is delinked from the syllable contributing the H tone (H Tone Shift). This delinking is optional in isiNdebele – (1a) can also be pronounced as *sí[tjéllíile* – or the first stem syllable is higher in pitch than the prefix syllable but lower than the PU (cf. similar “gradient shift” effects in other Nguni language, e.g. “X-sequences” in isiXhosa as labelled by Cloughton 1992). With prefix tones the H tone is not delinked from the H-contributing syllable (2b&c).

When there are two H tones within the same word, the prefix H spreads until the second H and there is no Downstep between the two H tones (3). These two

adjacent H tones form an OCP (Obligatory Contour Principle) violation which is resolved by fusing the two tones. The left edge behaves like the prefix H tones, that is, there is no delinking (cf. example 2 above), while the right edge shows that it is the stem H that is realized on the PU (cf. example 1 above). In the presence of a prefix H tone, the stem H tone is not delinked from the syllable contributing it.

(3a) *úku[síika* 'to cut'

(3b) *úku[bóníisa* 'to show'

Since both prefix and stem tones form a falling tone on the PU if the lexical H is contributed by a pre-APU, the lexical tone difference is neutralized in many longer forms. As seen above, bisyllabic and trisyllabic infinitives of toneless stems have a falling tone on the PU as they spread the pre-APU H tone until the first mora of the PU (4a). These contrast with a level H tone on the PU with bisyllabic and trisyllabic H stems (4b). But with 4-syllabic stems, both toneless (5a) and H stems (5b) have a falling tone on the PU, since the contributors of both prefix and stem H tones are pre-APU and only spread to the first mora of the long penult.

(4a) *úku[hléeka* 'to laugh' *úku[hlékiisa* 'to make laugh'

(4b) *úku[síika* 'to cut' *úku[bóníisa* 'to show'

(5a) *úku[fikéléela* 'to reach'

(5b) *úku[bónákáala* 'to be visible'

The analysis thus far can be summarized as follows:

(6) H tones contributed by stems (utterance-final form)

- a) If contributed by the APU or PU, the H tone target is the second mora of the lengthened PU.
- b) If contributed by a pre-APU syllable, the H tone target is the first mora of the lengthened PU.
- c) Delinking from the H-contributing syllable is optional when no other H tone precedes, but does not apply in the presence of a prefix H.

(7) H tones contributed by prefixes (utterance-final form)

- a) The target of the H tone is the first mora of the lengthened PU.
- b) Delinking does not apply.
- c) Spreading can be stopped by a stem H tone. The two adjacent H tones are fused, and the fused H behaves like a prefix H at the left edge (no delinking) and like a stem H at the right edge.

As is typical for Nguni languages, isiNdebele has a set of consonants called depressor consonants (see, e.g. Downing 2009). IsiNdebele depressor consonants are, in orthographic symbols, **bh**, **d**, **g**, **dz**, **dlh**, **j**, **z**, **dl**, and **gq** (depressor consonants are bolded in the examples below). While the phonetic properties of these consonants vary (see Schulz *forthcoming* for an account), they have a unified effect on the tone of the syllable in question. In addition, all sonorant consonants can be depressors, and the depressor and non-depressor sonorants are distinguished only by tone. The depressor effects on nominal stems are discussed with each nominal tone pattern below.

3. BISYLLABIC NOUN STEMS

Bisyllabic noun stems make up the most common stem type for nouns in Bantu languages, and isiNdebele is no exception. Many Nguni languages, for example isiZulu (Clark 1988) and Siphuthi (Donnelly 2009), have four contrastive stem tone patterns for bisyllabic noun stems. IsiNdebele has a tone system that deviates from this pattern: for bisyllabic stems, only two underlying – that is, contrastive – patterns are identified, although several other patterns are found in the surface forms.

Since the augment contributes a H tone in addition to the possible lexical H tone of the noun stem, we will first have a look at forms in which the augment is not found. In isiZulu, forms without the augment are frequently found in negative phrases. However, isiNdebele augment is also found in many negative phrases, but it is not present in the negative possessive constructions and negated existential predications (see Miestamo, Helenius & Kajala in this volume on augments).

Because the augment – the vowel together with its H tone – is absent in the negative possessive construction, toneless (\emptyset) bisyllabic nominal stems are realized as all L, as in (8a), while the H-toned stems are realized with a level H on the long penultimate vowel, because the H tone is contributed by the PU of the stem, as in (8b). These two surface stem tone patterns for bisyllabic stems are represented here as LL.L and HH.L, with syllable boundaries marked with full stops.

- (8a) \emptyset : a-ngi-na abe-sana → *angíná be-saana* ‘I don’t have boys’
 \emptyset : a-ngi-na i-paka → *angíná paaka* ‘I don’t have a wild cat’
- (8b) H: a-ngi-na aba-tlhami → *angíná ba-tlháámi* ‘I don’t have storytellers’
 H: a-ngi-na i-ketsi → *angíná kéétsi* ‘I don’t have a greyhound’

If the syllable that is supposed to manifest the surface tone has a depressor consonant (depressor consonants bolded), the surface tone pattern is altered. When the

depressor consonant is the onset of the first syllable of the bisyllabic noun stem (9a) and when a depressor consonant is the onset of both stem syllables (9b) the H tone is realized as a rising tone on the long penultimate syllable. When only the second syllable has a depressor consonant, the surface pattern is the same as without depressors, that is, a level H on the PU, as the tone does not target the final syllable in utterance-final forms (9c).³

- (9a) H: a-ngi-na i-bhesi → *angíná bheési* ‘I don’t have a bus’
(9b) H: a-ngi-na i-bhaji → *angíná bháǎji* ‘I don’t have a jacket’
(9c) H: a-ngi-na i-tlgo → *angíná tlóógo* ‘I don’t have a clock’

As seen in the previous examples, the TBU following the depressor consonant is delinked from the H. This generalization holds for all noun stems and data with depressor consonants is included in the discussion of different stems types below to prove this. The surface tone patterns presented so far are summarized in Table 1.

Table 1 Surface stem tone patterns with depressor consonants in different positions in bisyllabic noun stems with long penultimate syllables.

	Surface	Underlying
No depressors	HH.L	H
	LL.L	Ø
1st depressor	LH.L	H
	LL.L	Ø
2nd depressor	HH.L	H
	LL.L	Ø
1st&2nd depressor	LH.L	H
	LL.L	Ø

The two-way (H vs. Ø) contrast is also maintained when the augment, together with its H tone, is present, but the augment H affects the surface realizations of the nominal stems. As presented above (see 6 and 7 above), a pre-APU H tone contributed by either the prefix or the stem is realized as a falling tone on the long PU, unless it is blocked by another H, and stem H tones contributed by the APU or PU syllables are realized as level H tones on the long PU. Therefore, with

³ See Downing & Aunio 2018 for a more detailed account of tone changes caused by depressors in isiNdebele.

toneless stems, the augment H targets the first vowel of the penultimate long vowel, and the first syllable of the stem has a falling tone (10a). With H-toned stems, the augment H and the stem H are fused and the penultimate syllable is realized with a level H tone (10b). In both cases, there is no delinking since the leftmost H is contributed by a prefix.

- (10a) Ø: abe-sana → ábésáana ‘boys’
 Ø: isi-tete → ísitéete ‘marsh’
 (10b) H: i-ketsi → íkéétsi ‘greyhound’
 H: aba-tlami → ábátlháámi ‘storytellers’

The same stem tone patterns are realized even when the augment vowel is merged with the vowel of the preceding word: toneless stems have a falling tone (11a) and H-toned stems a level H tone (11b). Merging of the augment *i*- with the last vowel of the previous word (*a*) changes the final *a* into *e*, as in (11a), from which the H tone is delinked but the H tone is manifested on the following underlyingly toneless nominal prefix and the stem.

- (11a) Ø: ngi-na isi-tete → ngine sitéete ‘I have a marsh’
 (11b) H: ngi-na aba-tlami → ngina bátlháámi ‘I have storytellers’

Toneless bisyllabic noun stems with a short noun class prefix *i*(N)- show that the prefix Hs target the first vowel of the PU, even when contributed by the APU, and form a falling tone on the long PU (12a). Some speakers also optionally use the falling tone pattern on toneless stems when the augment is *not* present (12b), which may be evidence of reinterpretation: in isiNdebele, nouns most often appear with an augment, and the stem patterns occurring with the augment are interpreted as stem tone patterns and maintained even when the augment – that is, the only morpheme contributing a H tone – is not present.

- (12a) Ø: i-paka → ípáaka ‘wild cat’
 (12b) Ø: a-ngi-na abe-sana → anginá be-saana/be-sáana ‘I don’t have boys’

The augment H spreads to the stem syllable with toneless stems if there is no depressor consonant on the first syllable of the stem, that is, when there are no depressors at all (as in 10a above) or the depressor is on the second syllable (13a). If the depressor occurs in the first syllable, as in (13b), or in both syllables, as in (13c), the augment H tone is delinked from the TBU following the depressor.

- (13a) Ø: i-ncwadi → *íncwáadi* ‘book’
 (13b) Ø: i-gama → *ígaama* ‘name’
 (13c) Ø: ama-doda → *ámádooda* ‘husbands’

H-toned stems with depressors have the same tone patterns with the augment (see (9) above) and without it, because it is the stem tone that is realized on the stem: the stem tone pattern is LH.L when the first syllable has a depressor (14a) and when both syllables have depressors (14b), but HH.L when only the second syllable has a depressor (14c).

- (14a) H: i-bh̥esi → *íbh̥é̃si* ‘bus’
 (14b) H: i-bh̥aji → *íbh̥aá̃ji* ‘jacket’
 (14c) H: i-tlogo → *ítl̥ó̃go* ‘clock’

With the first syllable as a depressor, we found one tonal minimal pair (15). Table 2 is extended from Table 1 above to show the surface stem tone patterns when the augment is present in utterance-final forms.

- (15) Ø: i-zinyo → *íziinyo* ‘name’
 H: i-zinyo → *íziínyo* ‘tooth’

Table 2 Surface stem tone patterns with depressor consonants in different positions in bisyllabic utterance-final noun stems with and without an augment

	w/o Aug	with Aug	Underlying
No depressors	HH.L	HH.L	H
	LL.L	HL.L	Ø
1st depressor	LH.L	LH.L	H
	LL.L	LL.L	Ø
2nd depressor	HH.L	HH.L	H
	LL.L	HL.L	Ø
1st&2nd depressor	LH.L	LH.L	H
	LL.L	LL.L	Ø

The tone patterns of bisyllabic nominal stems match those of bisyllabic infinitive stems: toneless stems have a falling tone on the lengthened PU unless first stem syllable has a depressor consonant in the onset position (16a), while H-toned stems have either a level H tone or a rising tone on the lengthened PU (16b).

- (16a) Ø: uku-fik-a → úkúfika 'to arrive'
 Ø: uku-bhac-a → úkú**b**haaca 'to hide'
 Ø: uku-tjhad-a → úkútjháada 'to marry'
 Ø: uku-gez-a → úkúgeeza 'to wash'
- (16b) H: uku-tjel-a → úkútjéla 'to tell'
 H: uku-dans-a → úkúdaansa 'to dance'
 H: uku-theng-a → úkúthénga 'to buy'
 H: uku-bhag-a → úkú**b**haga 'to bake'

We now turn to **phrase-medial** forms in which the PU of noun stems is not lengthened and refine the analysis presented above, since the target environment is now different. The forms without the augment again show the underlying tone patterns more clearly. As with the utterance-final forms presented above, in toneless stems the whole stem is toneless (L.L), as in (17a), but H-toned stems show H tone on both of the stem syllables and not only on the PU (H.H), as in (17b).

- (17a) Ø: a-ngi-na um-sana wabo → *angíná msana wáabo*
 'I don't have their boy'
- Ø: a-ngi-na abe-sana babo → *angíná besana báabo*
 'I don't have their boys'
- (17b) H: a-ngi-na um-tlhami wabo → *angíná mtlhámi wáabo*
 'I don't their their storyteller.'
- H: a-ngi-na aba-tlhami babo → *angíná batlhámi báabo*
 'I don't have their storytellers'

Adding the augment again modifies the surface tone pattern of toneless stems, but not H-toned stems. With toneless stems, the only H tone is, again, the H contributed by the augment; this prefix H targets the PU (18a). In H-toned stems, the stem H targets the final syllable of the noun (18b), as it does in the forms without the augment in (17) above.

- (18a) Ø: abe-sana aba-khulu → *ábésána ábákhúulu* 'big boys'
 Ø: um-sana om-khulu → *úmsána ómkhúulu* 'big boy'
- (18b) H: aba-tlhami aba-khulu → *ábátlhámi ábákhúulu* 'big storytellers'
 H: um-tlhami om-khulu → *úmtlhámi ómkhúulu* 'big storyteller'

The stem tone patterns in phrase-medial position with the augment are H.L for toneless stems and H.H for H-toned stems. With these examples we may summarize the analysis for phrase-medial forms as follows:

(19) H tones contributed by stems (phrase-medial form)

- a) If contributed by the PU, the H tone target is the final syllable.

(20) H tones contributed by prefixes (phrase-medial form)

- a) The H tone target is the PU.
- b) Delinking does not apply.
- c) Spreading can be stopped by a stem H tone, which leads to two adjacent H tones and subsequent fusing of the two H tones.

Comparing these to the analysis presented for utterance-final forms in (6) and (7) above enables us to make further generalizations about the HTS targets. The H tones contributed by the prefixes always target the PU, but the H tone is not spread to the second mora of the PU when the PU is lengthened in utterance-final forms, resulting in a falling H on the lengthened PU. The behaviour of stem H tones contributed by the APU or PU in lengthened and non-lengthened forms can be unified by postulating a non-finality restriction for the utterance-final forms: the target of these H tones is the final syllable, but in utterance-final forms the H tone is delinked from the final syllable resulting in a level H tone on the lengthened PU. The separate analyses presented above (6&7 and 19&20) can be combined as follows:

(21) H tones contributed by stems

- a) If contributed by the APU or the PU, the target of the H tone is the final.
- b) If contributed by a pre-APU syllable, the target of the H tone is the PU.
- c) In utterance-final position, the H tone is delinked from the final syllable.
- d) Delinking from the H-contributing syllable is optional when no other H tone precedes it, but does not apply in the presence of a prefix H.

(22) H tones contributed by prefixes

- a) The target of the H tone is the PU.
- b) In utterance-final forms, the H tone does not spread to the second mora of the lengthened PU.

c) Delinking does not apply.

d) Spreading can be stopped by a stem H tone, which leads to two adjacent H tones and subsequent fusing of the two H tones.

When a H-toned stem in phrase-medial position has a depressor consonant on its first syllable, the stem H is realized only on the stem-final syllable, as it is delinked from the TBU following the depressor onset (23a). When there is a depressor consonant on the final stem syllable, the stem H is realized on the first stem syllable only (L.H; 23b). When both stem syllables have depressor consonants, the stem is realized as L.L (23c).

(23a) H: um-dluli om-khulu → úmdluli ómkhúulu 'big person'

(23b) H: aba-fundi aba-khulu → ábáfúndi ábákhúulu 'big pupils'

(23c) H: i-mbongi e-khulu → ímbongi ékúulu⁴ 'big poet'

In toneless stems the prefix H spread to the PU is delinked when that syllable has a depressor; therefore, the surface realization of the stem is L.L when there is a depressor in the first syllable (24a) or in both the first and the second syllables (24b). When the depressor is in the last syllable only, the realization is the same as without depressors (H.L; 24c; cf. 18a above). Table 3 (on the following page) summarizes all the stem tone patterns discussed so far.

(24a) Ø: i-gama eli-khulu → ígama élikhúulu 'big name'

(24b) Ø: ama-doda ama-khulu → ámádoda ámákhúulu 'big husbands'

(24c) Ø: i-ncwadi e-khulu → íncwádi ékúulu 'big book'

The forms discussed so far are found either in the position where the penultimate syllable is typically lengthened in Nguni languages, usually rendered as phrase-final, or in phrase-medial position in which the penultimate lengthening does not apply. Most accounts of Nguni tonology only account for these two positions (see, e.g. Cassimjee & Kisseberth 2001: 328; Downing 1990). However, Donnelly (2009: 302) mentions a “discourse emphasis” strategy in Siphûthi and other Nguni languages in which the present indicative long form (*ya-*) is used utterance-medially with a short PU vowel but behaves tonally as a phrase-final form: the tone target is the APU. Cassimjee & Kisseberth (2001: 355–356) write that a *ya*-marked verb in isiXhosa shows the lengthened final forms “even though

4. The first stem consonant of the adjective is deaspirated when preceded by class 9 or 10 prefix. This is due to a common restriction among Nguni languages that nasals may not be followed by aspirated consonants. The nasal of the class prefix is not present on the surface in these examples but nevertheless conditions deaspiration (Skhosana 2009: 84).

Table 3 Surface stem tone patterns of bisyllabic noun stems in utterance-final and phrase-medial positions, with and without an augment, with depressor consonants in different positions.

	Utterance- final	Utterance- final	Phrase- medial	Phrase- medial	Underlying
	w/o Aug	with Aug	w/o Aug	with Aug	
No depressors	HH.L	HH.L	H.H	H.H	H
	LL.L	HL.L	L.L	H.L	Ø
1st depressor	LH.L	LH.L	L.H	L.H	H
	LL.L	LL.L	L.L	L.L	Ø
2nd depressor	HH.L	HH.L	H.L	H.L	H
	LL.L	HL.L	L.L	H.L	Ø
1st&2nd depressor	LH.L	LH.L	L.L	L.L	H
	LL.L	LL.L	L.L	L.L	Ø

it is not literally final”, that is, not utterance-final, but phrase-final. Zeller, Zerbian & Cook (2017) investigate syntactic phrasing in isiZulu and find that phrase-final, but utterance-medial, forms induce lengthening that is not as salient as that found utterance-finally. Nevertheless, this “medial position” behaves tonally like the utterance-final forms, blocking H tone movement to the penultimate position (Zeller, Zerbian & Cook 2017: 317).

The “medial position” is found in isiNdebele as well, but it seems to differ tonally from the patterns seen in the initial study of isiZulu by Zeller, Zerbian & Cook (2017). More research is needed to define what exactly constitutes the phonological and syntactic phrase in isiNdebele, but the three positions can be described as 1) **utterance-final**, that is, the forms presented above in which the PU is fully lengthened and the final vowel is excluded as the target; 2) **phrase-medial** with short PU vowels presented above – for example, when nouns are followed by a modifier; and 3) **phrase-final but utterance medial** – for example, when the noun is followed by an adverb which does not belong to the same phonological phrase as the noun but is in the same utterance.

The vowel length of the penultimate vowel of the “medial position” form appears to be somewhere between the fully lengthened utterance-final form and the short phrase-medial form – as is also the case for the forms tested by Zeller, Zerbian & Cook (2017) for isiZulu – but no detailed study has been performed on the phonetics and conditioning factors of vowel length in isiNdebele. However, this position in isiNdebele is marked by different surface tone patterns for H-toned stems: final H tones are realized just like in the short phrase-medial

forms (25; cf. 17b and 23 above), while in isiZulu the “medial position” matches tonally with utterance-final forms. In isiNdebele, the PU vowel is longer to indicate the phrase edge, but utterance-medial position makes it possible for the word-final H tones to be realized. The prefix H tone of toneless stems again targets the PU and is not affected by the lengthening of the PU vowel (26; cf. 17a and 24 above). This further proves that the target of the stem H tone is the final syllable, but final H tones are not allowed in utterance-final position.⁵

- (25a) H: *ngi-nyeny-a* um-tlhami khulu → *nginyenya úmtlháámí khúúlu*
‘I dislike a storyteller a lot’⁶
- (25b) H: *ngi-nyeny-a* i-bhesi khulu → *nginyenya íbheésí khúúlu*
‘I dislike a bus a lot’
- (25c) H: *ngi-nyeny-a* um-fundi khulu → *nginyenya úmfúúndi khúúlu*
‘I dislike a pupil a lot’
- (25d) H: *ngi-nyeny-a* i-bhaji khulu → *nginyenya íbhaáji khúúlu*
‘I dislike a jacket a lot’
- (26a) Ø: *ngi-nyeny-a* um-sana khulu → *nginyenya úmsáana khúúlu*
‘I dislike a boy a lot’
- (26b) Ø: *ngi-nyeny-a* i-dolo khulu → *nginyenya ídoolo khúúlu*
‘I dislike a knee a lot’
- (26c) Ø: *ngi-nyeny-a* i-ncwadi khulu → *nginyenya incwáadi khúúlu*
‘I dislike a book a lot’
- (26d) Ø: *ngi-nyeny-a* in-doda khulu → *nginyenya indooda khúúlu*
‘I dislike a man a lot’

Noun class prefixes of classes 8 *izi-* and 10 *ii(N)-* have a complex allomorphic distribution and these classes have partly merged into the same class in isiNdebele (see Crane et al. 2019 for more details). Prefix *izi-* mostly occurs with mono-syllabic stems (see Section 4 below) and with vowel-initial stems (see Section 5 below), but some speakers allow for class 8 plural for a few consonant-initial stems, such as *izi-tete* ‘marshes’. The depressor at the onset of the pre-PU syllable lowers the tone of that syllable but otherwise the tone pattern is not altered: *ízitéete* (cf. *ísitéete* ‘marsh’ in 10a above).

5 Some speakers actually pronounce the final H tone also in utterance-final position, but this needs more investigation.

6 The “medial position” vowels are written with double vowels in examples (25) and (26) to make it easier to compare the tone patterns to the fully lengthened forms.

Interestingly, prefix *ii(N)*- also shows depressor effects although there is no overt depressor consonant in the prefix. However, in isiZulu the class 10 prefix is *izi(N)*-, and therefore we can assume that isiNdebele has reduced the segmental shape of the prefix but maintained the depressor quality of the prefix (see Aunio & Schulz 2018 for further details). Although the orthography presents the prefix with two vowels, phonetically, it consists of a short vowel and a long, syllabified nasal [in:] with depressor qualities. The plural of *i-ncwadi* ‘a book (cl. 9)’ → *incwáadi* (see (13) above) is *ii-ncwadi* ‘books (cl. 10)’ → *innchwáadi*; the plural differs from the singular in that the nasal is longer and the pitch of the nasal is lowered while the pitch of the nasal in the singular is H (not marked in the transcription since the nasal in the singular is not syllabic and is therefore not a tone bearing unit).⁷

4. MONOSYLLABIC NOUN STEMS

Monosyllabic noun stems show the same two contrastive stem tone patterns as bisyllabic stems, that is, toneless versus H-toned, but since the syllable contributing the lexical tone is the final syllable, the surface realizations show patterns not seen with the bisyllabic stems discussed above. In the following, we first present the patterns we found, and then discuss a possible analysis.

In toneless stems in utterance-final position, the surface pattern is a level H on the long PU, both without and with a depressor consonant on the noun stem (27a). In H-toned stems the long PU has a falling tone (27b). The stems are realized with a L tone in both cases, but the tone difference is manifested on the lengthened vowel of the noun class prefix. Note that the surface patterns are now opposite to what is found with bisyllabic stems: level H surfaces with the toneless stems, and falling tone surfaces with the H-toned stems.

(27a) Ø: *umu-ntu* → *úmúúntu* ‘person’

Ø: *umu-zi* → *úmúúzi* ‘house’

(27b) H: *umu-thi* → *úmúuthi* ‘tree’

H: *ili-hlo* → *ílihlo* ‘eye’

H: *umu-da* → *úmúuda* ‘line’

⁷ In class 9 and 10 the nasal of the prefix has been historically reanalysed as part of the stem. See Crane et al. 2019 for more details.

The same two patterns emerge with shorter prefixes of the shape V-, namely, level H on the long vowel when the stem is toneless (28a) and falling tone when the stem is underlyingly H-toned (28b).

- (28a) Ø: i-so → *íiso* 'kidney'
 Ø: i-ngwe → *íingwe* 'leopard'
 (28b) H: i-mvu → *íimvu* 'sheep'⁸

Monosyllabic infinitives show the same two patterns as monosyllabic nouns (29).

- (29a) Ø: uku-b-a → *úkúúba* 'to become'
 Ø: uku-lw-a → *úkúúhwa* 'to fight'
 Ø: uku-z-a → *úkúúza* 'to come'
 (29b) H: uku-ph-a → *úkúupha* 'to give'
 H: uku-f-a → *úkúufa* 'to die'
 H: uku-dl-a → *úkúudla* 'to eat'

Without the augment, the lexical tone pattern is neutralized, as both toneless and H-toned nouns are realized as L on both the prefix and the stem (30). Although the surface realizations are identical, the underlying forms are different: toneless nouns simply do not have an underlying H to be realized when the augment H is not present, while the H of the H-toned stems cannot be realized since it is utterance final.

- (30) Ø: a-ngi-na umu-ntu → *angíná muu-ntu* 'I don't have a person'
 Ø: a-ngi-na umu-zi → *angíná muu-zi* 'I don't have a homestead'
 H: a-ngi-na umu-thi → *angíná muu-thi* 'I don't have a tree'
 H: a-ngi-na ili-hlo → *angíná lii-hlo* 'I don't have an eye'

In phrase-medial forms, the augment H of the toneless stems spreads all the way to the nominal stem (31a), while with H stems, the augment H does not spread to the final (31b). In these cases, the stem syllable of the toneless stems is realized as H, while the H-toned stems are realized as L. When the stem syllable has a depressor, the tonal difference is again neutralized (31c&d).

⁸ Since there is a limited number of monosyllabic noun stems, a H monosyllabic stem without a depressor consonant in class 9 forms an accidental gap in the data.

- (31a) Ø: umu-ntu om-khulu → *ú*múntú *óm*khúulu ‘a big person’
 (31b) H: umu-thi om-khulu → *ú*múthi *óm*khúulu ‘a big tree’
 (31c) Ø: i-ngwe e-khulu → *í*ngwe *ékú*ulu ‘a big leopard’
 (31d) H: i-mvu e-khulu → *í*mvu *ékú*ulu ‘a big sheep’

As shown for bisyllabic stems above, prefix H tones target the PU, even when contributed by the APU, and create a falling tone on a long PU (see example 12 above). However, this is not the case with toneless monosyllabic stems; rather, the target is the final with a short PU, and a level H tone is formed on the PU when the PU is long – the surface pattern employed by H-toned bisyllabic stems. Therefore, a condition to the analysis presented in (22) above needs to be added: the prefix H tone, unless blocked by another H tone, needs to minimally reach the first stem syllable, as in (31a). In utterance-final forms (27a above) the stem syllable is the final syllable of the utterance and therefore the H tone is delinked from the final syllable. The analysis is updated in (32).

(32) H tones contributed by prefixes

- a) The target of the H tone is the PU, but the H tone must reach the stem.
- b) In utterance-final forms the H does not spread to the second mora of the lengthened PU.
- c) Delinking does not apply.
- d) Spreading can be stopped by a stem H tone, which leads to two adjacent H tones and subsequent fusing of the two H tones.

With H-toned monosyllabic stems, the spread of the augment H stops earlier than expected, as normally adjacent H tones are fused (see example 3 above). As seen above, the phrase-medial form is the basic form for H Tone Spread/Shift, and utterance-final forms simply exclude the final from the surface realization. Taking the phrase-medial form as the starting point helps to explain the peculiar surface pattern of monosyllabic H-toned stems: in phrase-medial forms, the prefix H cannot spread to the stem, as it already has a H tone (31b); this failure to spread has led to a reanalysis of the PU as the target in this form. Next, the final stem H is lost – the same has been reported for younger speakers of Zimbabwean Ndebele (Rycroft 1983) – but PU has remained as the target of the tone spread in these forms, and therefore the surface patterns are identical to those of longer toneless stems that also target the PU. The analysis is updated in (33).

(33) H tones contributed by stems

- a) If contributed by the APU or the PU, the target of the H tone is the final syllable unless that syllable is underlyingly H-toned.
- b) If contributed by a pre-APU syllable, the target of the H tone is the PU.
- c) In utterance-final position, the H tone is delinked from the final syllable.
- d) Delinking from the H-contributing syllable is optional when no other H tone precedes but does not apply in the presence of a prefix H.

In this analysis, the underlying tones correspond to Proto-Bantu stems: H stems in Proto-Bantu are analysed as H in isiNdebele and Proto-Bantu L stems are analysed as toneless. Another possibility is that the stem tones might have changed over time to become the opposite of the Proto-Bantu stem tones, matching the surface forms of bisyllabic stems. However, extending the nominal stems with suffixes reveals that our analysis is also synchronically plausible: toneless monosyllabic stems exhibit the surface pattern of toneless bisyllabic stems when extended by a suffix that is itself toneless (34a) – that is, a falling tone on the long PU (contributed by the augment) – while extended H-toned monosyllabic stems match the H-toned bisyllabic pattern and have a level H tone on the long PU (34b), contributed by the nominal stem. Table 4 summarizes the surface tone patterns on monosyllabic noun stems.⁹

- | | | | | |
|----------|--------------------------|-----------------------|-----------------------|-----|
| (34a) Ø: | <u>u</u> mu-no | → <u>ú</u> múúno | ‘finger’ | vs. |
| | ise- <u>u</u> mu-no-eni | → <u>í</u> sémúnwéeni | ‘it is in the finger’ | |
| Ø: | <u>u</u> mu-ntu | → <u>ú</u> múúntu | ‘person’ | vs. |
| | <u>u</u> mu-ntu-ana | → <u>ú</u> mntwáana | ‘a child’ | |
| (34b) H: | <u>u</u> mu-thi | → <u>ú</u> múuthi | ‘tree’ | vs. |
| | ise- <u>u</u> mu-thi-eni | → <u>í</u> sémthíini | ‘it is in the tree’ | |

⁹ Phrase-medial forms without the augment are missing from the current set of data.

Table 4 Surface stem tone patterns without and with depressor consonants in monosyllabic noun stems, shown with and without an augment for utterance-final forms, and with an augment for phrase-medial forms

	Utterance- final	Utterance- final	Phrase- medial	Underlying
	w/o Aug	with Aug	with Aug	
No depressors	L	(HL-)L ¹⁰	L	H
	L	(HH-)L	H	Ø
Depressor	L	(HL-)L	L	H
	L	(HH-)L	L	Ø

5. LONG NOUN STEMS

More stem syllables provide more logical options for tone patterns. While monosyllabic stems are restricted to a H vs. L (or toneless) opposition, bisyllabic stems can have four patterns (H.H, H.L, L.H, L.L; see Section 3 above). In trisyllabic stems eight patterns (H.L.L, H.H.L, H.H.H, L.H.L, L.L.H, L.H.H, L.L.L, H.L.H) are possible, and the number of logical possibilities for 4-syllabic stems is already 16. While it is possible for a language to make use of all the logical possibilities, it is often the case that the number of tone patterns in use is restricted: in longer words there is more segmental material to identify the lexical item and therefore a full tonal distinction is not needed (Aunio *forthcoming*).

As we have seen above, the stem tone distinctions of bisyllabic noun stems in isiNdebele have been reduced to two: toneless and H-toned. It was established that the stem-initial syllable is the source of the tone difference. Looking only at bisyllabic stems, the conclusion could be that the final syllable is excluded as a source for tone specification, but we saw that the distinction is retained with monosyllabic stems as well. Therefore, we can state that the tone specification of nominal stems is restricted to H versus toneless stems, regardless of the length of the stem and we do not expect to have more patterns in longer words than we have in shorter words.

In addition, the analysis presented above predicts that any H tone contributed by the APU is realized as a level H tone on the lengthened penult, while any pre-APU H tones form a falling tone on the lengthened penult (see example 2 above). This limits the number of expected tone patterns to two, even with longer stems, with the tonal difference manifested on the long penultimate

¹⁰ Tonal difference displayed on the nominal prefix.

syllable. And indeed, this pattern is found with trisyllabic stems where toneless stems have a falling tone on the lengthened PU, contributed by the augment (35a), while trisyllabic H stems have a level H on the lengthened PU, contributed by the APU (35b).

- (35a) Ø: isi-biliso → *ísibíliiso* 'yeast'
 Ø: isi-abelo → *ísábéelo* 'a share'
 Ø: um-belethi → *úmbéléethi* 'a parent'
- (35b) H: isi-bulawo → *ísibúlááwo* 'a weapon'
 H: isi-ahluko → *ísáhlúúko* 'a chapter'
 H: i-bubulo → *íbúbúúlo* 'a company'

The same surface patterns as those seen in shorter stems emerge when the augment is deleted: the toneless stems are realized as L now that there is no augment that would contribute a H tone that spreads to the stem (36a), and the H stems have a level H tone on the PU, again contributed by the first stem syllable (APU) (36b).

- (36a) Ø: a-ngi-na isi-biliso → *angíná sibíliiso* 'I don't have yeast'
 Ø: a-ngi-na isi-abelo → *angíná sabeelo* 'I don't have a share'¹¹
- (36b) H: a-ngi-na isi-bulawo → *angíná sibúlááwo* 'I don't have a weapon'
 H: a-ngi-na isi-ahluko → *angíná sáhlúúko* 'I don't have a chapter'

Phrase-medial forms with a short PU show the same pattern as the shorter stems: the pre-APU H targets the PU (37a) while the stem H of the APU targets the final (37b).

- (37a) Ø: isi-biliso si-ami → *ísibíliiso sáámi* 'my yeast'
 Ø: isi-abelo si-ami → *ísábéelo sáámi* 'my share'
- (37b) H: isi-bulawo si-ami → *ísibúlááwó sáámi* 'my weapon'
 H: isi-ahluko si-ami → *ísáhlúkó sáámi* 'my chapter'

11 As with the shorter stems in example (12b) above, some speakers seem to have lexicalized the tone pattern stemming from the augment and pronounce the falling pattern on the PU of toneless nouns even when the augment is not present, e.g. *angína sábéelo*.

In the negative copula forms in (38), the prefix H is not contributed by the augment, but rather by the negative copula prefix, which is itself realized as L but which induces a H tone on the following syllable. The noun class prefix is not present with consonant-initial stems, but it is found with vowel-initial stems in this copula form.

- (38a) Ø: a-ku-si si-biliso si-ami → *akusí sibiliso sáámi*
 'it is not my yeast'
- Ø: a-ku-si si-si-abelo si-ami → *akusí sisábélo sáámi*
 'it is not my share'
- (38b) H: a-ku-si si-bulawo si-ami → *akusí sibúláwó sáámi*
 'it is not my weapon'
- H: a-ku-si si-si-ahluko si-ami → *akusí sisáhlúkó sáámi*
 'it is not my chapter'

A depressor on the first stem syllable (APU) lowers the H of that syllable while the tone pattern is otherwise just like without depressors (39a&b). A depressor on the second stem syllable (PU) delinks the prefix H from the PU (39c), but the stem H is realized as a rising H on the PU with a depressor (39d). A depressor on the final syllable does not affect the realization of the tones in these utterance-final forms (39e&f).

- (39a) Ø: i-bhontjisi → *íbhontjisi* 'bean'
- (39b) H: i-bhaloni → *íbhalóni* 'balloon'
- (39c) Ø: is-ambatho → *ísámbaatho* 'cloth'
- (39d) H: is-aziso → *ísáziiso* 'notice'
- (39e) Ø: um-cabango → *úmcábáango* 'thought'
- (39f) H: um-berego → *úmbéréégo* 'task'

Trisyllabic infinitive stems demonstrate the same two types of tone patterns.

- (40a) Ø: uku-hlekis-a → *úkúhlékíisa* 'to make sb. laugh'
- Ø: uku-dabul-a → *úkúdabúula* 'to rip'
- Ø: uku-bambel-a → *úkúbámbeela* 'to hold on'
- Ø: uku-thokoz-a → *úkúthókóoza* 'to thank'
- (40b) H: uku-bonis-a → *úkúbóníisa* 'to show'
- H: uku-zwisis-a → *úkúzwísíisa* 'to understand'

H: uku-sungul-a → úkúsúnguúla 'to begin'

H: uku-sebenz-a → úkúsébéénza 'to work'

Most 4-syllabic and longer stems encountered so far are reduplications, compound stems, stems derived from verbs, or loan words, and possibly have special tone rules – these need more systematic work before a full analysis can be presented. However, with the limited set of data available, some observations can be presented.

The analysis presented above (see examples 32 and 33 above) – namely, that the PU and APU Hs target the final and that pre-APU Hs target the PU – suggests that the surface lexical tone contrast is neutralised in 4-syllabic and longer stems when the augment is present. This neutralisation can be seen with infinitives (see Section 1). In addition, nouns occur without the augment in a very limited set of contexts; that is, the most common contexts are the ones in which the neutralization takes place. Taking into account that tonal differences are less crucial in distinguishing meaning in longer words, it is not surprising to find tone neutralization with long nouns. For example, the surface tone for *ábá-béléthiisi* 'midwives' is the same whether or not the stem has a H tone; that is, both underlying forms, toneless (*aba-belethiisi*) and H-toned (*aba-belethiisi*), would give the same surface form. Therefore, while some speakers treat it as a H-toned stem (*angína ba-béléthiisi* 'I don't have midwives'), others treat it as a toneless stem (*angína ba-belethiisi* 'I don't have midwives').

Stems with depressor consonants neutralize the tone contrast even further: those speakers who analyse the stems without depressors as toneless also do so when there are depressor consonants on the stem. But long stems with depressors are also frequently analysed as toneless by those for whom the stems without depressors are clearly H-toned stems. In general, the tones of these stems are far from stable, and there is variation even in the speech of the same individual, again indicating the lowered functional load of the lexical tones.

Loan words also have some variation at the segmental level, adding to the confusion about the lexical tones. For example, *í-bbedirúúde* 'beetroot' has an unexpected level H on the long penult. This tone pattern is, however, a fully regular realization of a trisyllabic H-toned stem, pronounced as such by another speaker as *í-bbedruúde*. The rising tone on the penult is because of the depressor *d*, which is in the penultimate syllable now that the epenthetic vowel is not pronounced.

6. COMPARISON AND CONCLUSIONS

As the analysis of isiNdebele presented here deviates from the “general” Nguni pattern in which the H tones target the APU (e.g. Downing 2004: 130), in this section we will present some observations about the tone realizations in isiNdebele in comparison to what is described for other Nguni languages. We will also summarize the phonological arguments for the distinct analysis and compare the isiNdebele tone system to that of its closest Nguni relatives, isiZulu and Zimbabwean Ndebele, as well as to the geographically close Sotho varieties.

It has been described above that in isiNdebele, any pre-APU H tones target the PU and form a falling tone on the lengthened penult. For Nguni languages in general, Cassimjee & Kisseberth (2001: 331) describe this surface pattern as a “purely phonetic fall” which follows a H on the preceding syllable and is distinct from “the true falling-toned penult syllables (which have a somewhat greater duration of the H portion of the fall).” Rycroft (1980a: 126) describes this phonetic falling as a “falling pitch onset glide” in Zimbabwean Ndebele. In isiNdebele, the fall on the lengthened PU often begins with a *higher* pitch than the preceding H-toned syllable (Figures 1 and 2), possibly indicating a later pitch target than in Nguni languages in general, and falls evenly throughout the

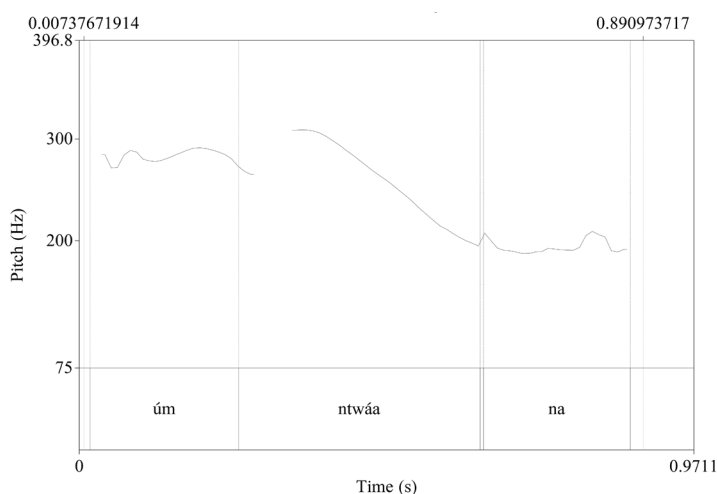


Figure 1 *úmntwána* ‘a child’: a H tone spread from the augment peaks at the beginning of the PU and falls steadily throughout the whole syllable.

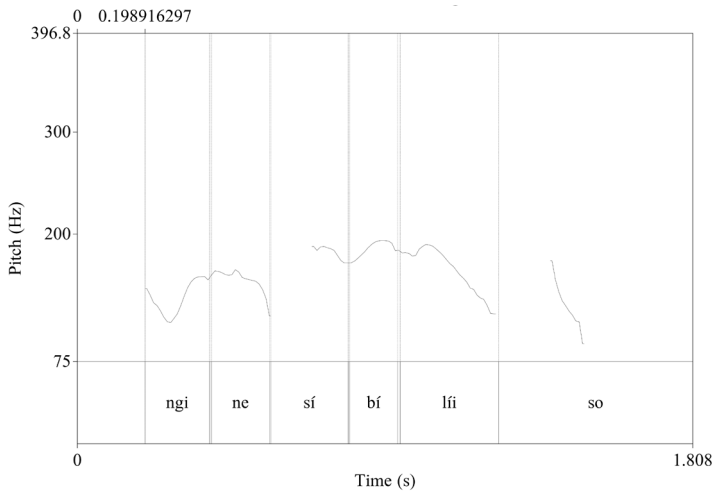


Figure 2 *ngine sibiliiso* 'I have yeast': a H tone spread from the augment (*ngina* $\dot{\iota}$ → *ngine*) spreads to the PU and falls steadily throughout the whole syllable.

whole syllable.¹² Also, Cassimjee & Kisseberth's "true falling-tone" – that is, a H shifted from the APU to PU when the APU has a depressor consonant – is realized in isiNdebele with the same type of pitch as the "purely phonetic fall": as descending through the whole syllable (Figure 3).

The H tones contributed by the APU or the PU that are realized as a level H tone on the lengthened PU also differ phonetically from what has been reported for Nguni languages in general. Cassimjee & Kisseberth (2001: 331) write that "in all the varieties of Nguni that we have studied, we have observed that a H tone on the penult has a clearly descending shape, the consequence is that a penult H tone ends up significantly lower than a preceding antepenult H." This is true for

12 There is a cross-linguistically attested phenomenon of peak delay which sounds similar to the PU pitch peak in isiNdebele: a H tone does not reach its pitch peak until the beginning of the following syllable. Peak delay is reported for some Bantu languages, for example, Chichewa (Myers 1999). However, peak delay is presented as a possible phonetic explanation for what can be accounted for phonologically as bounded spreading, that is, when a H tone only spreads to the following syllable. In isiNdebele, the spreading is unbounded as the context for the falling PU requires the H tone to be contributed by a pre-APU syllable which is not adjacent to the PU. Zerbian and Barnard (2009) report on a production study of Northern Sotho H tone realization and conclude that both phonetic (peak delay) and phonological (H tone spread) factors contribute to the fact that a H tone is, in certain contexts, realized both on the contributing and on the following syllable.

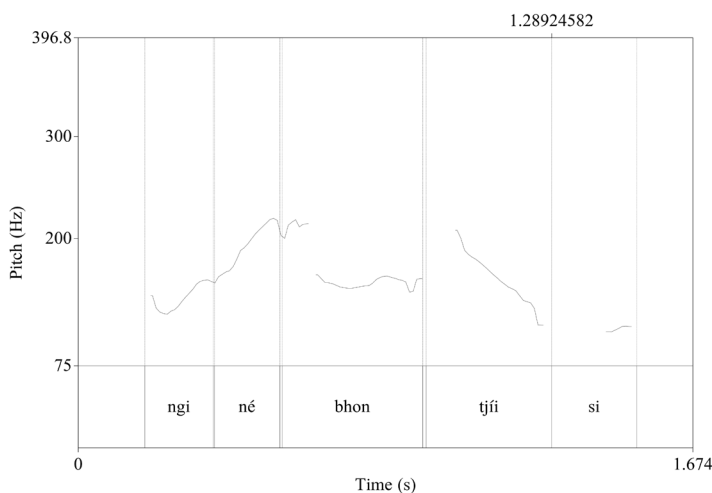


Figure 3 *ngine bhontjiisi* 'I have a bean': a H tone spread from the augment (*ngina i- → ngine*) spreads to the PU with a lowering at the depressed syllable and falls steadily throughout the whole syllable.

some speakers of isiNdebele, but for other speakers, the level H on the PU is realized with a rather stable pitch (Figure 4).

Although there are potential *phonetic* differences between isiNdebele and the Nguni languages that have been described as targeting the APU, the arguments for a differing analysis presented here for isiNdebele come from the *phonological* system. Cassimjee and Kisseberth (2001: 355) write that “[a] characteristic feature of Nguni seems to be the behavior of word-final H tones. In a number of varieties, word-final H tones are retained when the word is in final position in the phrase but deleted in phrase-medial position. This distribution is somewhat surprising. One would expect that phrase-final position would be more antagonistic to H tone than phrase-medial position. After all, there is a general preference for pitch to go down at the end of a (declarative) intonational phrase whereas medial position is not at all a position where there is a preference for lowering of pitch.” As seen above, isiNdebele shows the expected pattern; that is, H tones are *not* allowed in utterance-final position but they *are allowed* utterance-medially, regardless of the phrase boundaries. This difference suggests a different analysis of the HTS target: the stem-initiated (APU and PU) H tones target the final in phrase-medial position – not the PU as in many other Nguni languages – but the final H is deleted in utterance-final position.

It was mentioned only in passing above (see example 12b and fn. 11 above) that some toneless stems have a falling tone on the long PU even in contexts where

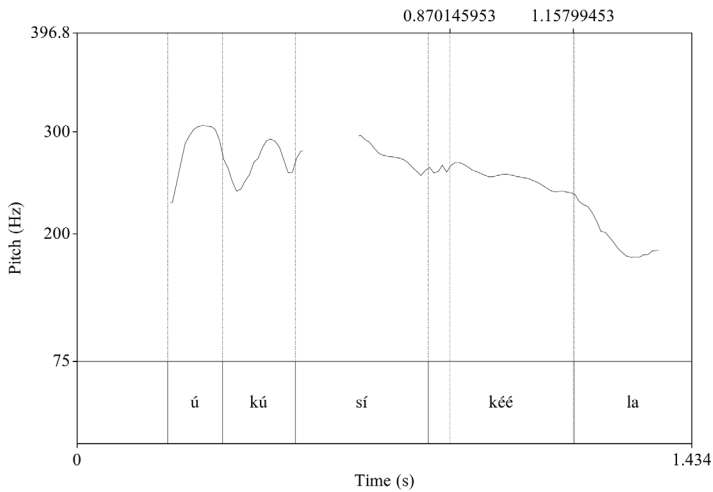


Figure 4 *úkúsíkééla* 'to cut for someone': a H tone contributed by the APU realized as a fairly level H tone on the PU.

there is no contributor of the H tone, that is, where the augment is not present. This phenomenon shows that some speakers have reanalysed the falling tone as the distinctive pattern and associated it with the nominal stem; the PU as the target of H tone spread has been phonologized. This is in contrast with what is described, for example, for Zimbabwean Ndebele, where "[w]ith most speakers, no tonal contrast is realized on the noun stem itself" (Rycroft 1983: 88). In isiNdebele the stem has become the domain in which the lexical contrast is realized.

Although most Nguni languages seem to follow the Avoid Prominence Principle (Cassimjee & Kisseberth 2001: 336), targeting the prominent PU is found in some other Nguni languages as well. For example, stem-initiated H tones target the PU in Cele and Durban Zulu varieties as well as in Malawian Ngoni. Cassimjee and Kisseberth give analogy as a possible explanation: as the majority of verb stems are two or three syllables long – in which case the tone is contributed by APU or PU and the H target is therefore the PU – the surface pattern has been generalized to longer stems as well. This, in turn, is similar to the isiNdebele reanalysis of the augment tone pattern as the stem tone pattern.

Some varieties of Sotho, for example Southern Sotho (Sesotho), display bounded H tone spread and spread a H tone only to the adjacent syllable on the right, while unbounded spread is found in Northern Sotho dialect clusters (Zerbian 2006). Interesting to our discussion is the variation found in the target of the unbounded HTS: in the Setswapo dialect described by Monareng (1993),

the target of HTS is the APU, as it is in the majority of Nguni languages, but in a northwestern dialect of Northern Sotho studied by Zerbian (2006), the target of HTS is the PU. Northern Sotho dialects are spoken in the same area as isiNdebele in northern South Africa and many speakers of isiNdebele also speak Northern Sotho, but the possible Sotho influences in isiNdebele remain to be studied.

As for the closest Nguni relatives of isiNdebele, today the isiNdebele speakers are geographically much closer to speakers of isiZulu than to speakers of Zimbabwean Ndebele, but the reverse was probably true at some point in history (see Introduction to this volume). Tonally, isiNdebele is closer to Zimbabwean Ndebele than to isiZulu, which suggests a period of intensive contact between these two groups of Ndebeles after their departure from the coastal plains to the Highveld. Some shared features of the two Ndebele languages as opposed to isiZulu are, for example, 1) the augment H tones spread rather than shift to the prefix syllable and/or to the nominal stem (although there are isiZulu varieties that spread prefix tones); 2) the 4-way lexical tone contrast of bisyllabic and longer stems is mostly reduced to a 2-way contrast; and 3) lexical H tones contributed by the final syllable are deleted (Rycroft 1980a; 1980b; 1983).

In isiZulu, the underlying stem tone patterns for bisyllabic stems are LL, HL, FL, and LH (Rycroft 1963; Clark 1988). In Zimbabwean Ndebele, as presented by Rycroft (1980a), three patterns seen in isiZulu – LL, FL, and LH – have collapsed to a single LL pattern. These tone patterns have collapsed in isiNdebele, as well (41). The loss of lexical final H tones accounts for the collapse of LL and LH patterns (to LL) and points to a shared history between the two Ndebele languages, independent of isiZulu.

(41)	isiZulu (Rycroft 1983)	Zim.Ndebele (Rycroft 1983)	isiNdebele	
LL:	<i>abá-ntwana</i>	<i>ábá-ntwana</i>	<i>ábá-ntwána</i>	‘children’
FL:	<i>ísi-khw'âma</i>	<i>ísi-khwama</i>	<i>ísi-khwáma</i>	‘bag’
LH:	<i>ín-komó</i>	<i>ín-komo</i>	<i>í-kómo</i>	‘head of cattle/cow’

As shown in Section 5 above, the lexical tone difference is maintained for trisyllabic stems in isiNdebele, both with and without the augment. In Zimbabwean Ndebele this contrast is partly neutralized: both toneless and H-toned stems have the surface stem tone pattern HLL without the augment (*ábá-ntwányana* ‘small children’ vs. *í-ntwányana* ‘tiny thing’) but are distinguished when the augment is not present (LLL as in *ba-ntwányana* ‘small children’ vs. HLL as in *ntwányana* ‘tiny thing’) (Rycroft 1983: 86). As the stem H tone in H-toned trisyllabic stems

is contributed by the APU, the expected stem pattern should be HHL, which is seen in Zimbabwean Ndebele verbs, for example, *úkúbónisa* 'to show' (Rycroft 1983: 93). Rycroft does not discuss the reasons for this anomaly, but it might be significant that all stems in his examples are derived.

Some extended trisyllabic nominal stems in Zimbabwean Ndebele have the expected HHL pattern, but these stems are toneless in their underived form. Rycroft (1983) shows that these stems that have either the LH or the FL pattern in isiZulu; that is, they historically had a H tone on the stem final syllable that is now visible only in derived forms. This is the case in isiNdebele as well. For example, *ísi-khwáama* 'bag' is a toneless stem, but it shows the H pattern when derived: *línge síkhwámééni* 'it is in the bag'; this noun has the FL pattern in isiZulu (see example 41 above).

The third pattern of Zimbabwean Ndebele trisyllabic stems, LLL, is a marginal pattern of "a few non-derived stems" that corresponds to the combination of the LL and FL patterns in isiZulu (Rycroft 1983: 85). No corresponding pattern has been identified in isiNdebele.

In 4-syllabic and longer stems, the surface tone pattern with the augment present is the same for all nouns. This is also the case in Zimbabwean Ndebele, although there are "a small number of nouns with irregular patterns" (Rycroft 1983: 88). In Zimbabwean Ndebele the forms without the augment are the two lexical tone patterns of H-toned and toneless stems.

As stated above, isiNdebele does not show downstep between two adjacent H tones, unlike isiZulu. Rycroft (1980a; 1983) does not describe downstep for Zimbabwean Ndebele, either, but in Sibanda's (2004) analysis both H and toneless stems-initial syllables are downstepped when adjacent to the augment H. Since there is a downstep between the prefix and the stem in Sibanda's analysis, even when there is underlyingly only one H tone, the drop in pitch is not phonological.

Rycroft (1983) notes that some older speakers of Zimbabwean Ndebele have maintained some tone distinctions found in isiZulu that are lost in the speech of younger speakers of Zimbabwean Ndebele. This retention of tonal distinctions is not attested with isiNdebele speakers, but tonal irregularities that could be due to heavy contact with isiZulu are found in the speech of younger generations of isiNdebele speakers as well. This variation, as well as the influence of the other contact languages, warrants further research.

This paper has described isiNdebele nominal tone patterns as they can be understood based on the current set of data. The system is reduced from the nominal tone system found in isiZulu, but it resembles the Zimbabwean Ndebele nominal tone system in that only two basic lexical tone types, toneless and

H-toned stems, can be identified. It was also established that the basic H tone spreading/shifting rules employed to derive the surface tone patterns from the underlying tones differ from those found in other Nguni languages: 1) pre-APU H tones target the PU, and 2) APU and PU tones target the final.

REFERENCES

- AUNIO, Lotta *forthcoming*. Nominal Tone Contrasts. In: L. MARTEN, N. KULA, J. ZELLER & E. HURST (eds), *The Oxford Guide to the Bantu Languages*. Oxford: OUP.
- AUNIO, Lotta & Stephan SCHULZ 2018. Depressor Effects of Noun Class Prefix 10 in isiNdebele. A paper presented at SLE 51, Tallinn, 29 Sept. 2018.
- CASSIMJEE, Farida 1998. *Isixhosa Tonology: An Optimal Domains Theory Analysis*. München: LINCOM Europa.
- CASSIMJEE, Farida & Charles W. KISSEBERTH 1998. Optimality Domains Theory and Bantu Tonology: A Case Study from Isixhosa and Shingazidja. In: L.M. HYMAN & Ch.W. KISSEBERTH (eds), *Theoretical Aspects of Bantu Tone*: 33–132. Stanford: CSLI Publications.
- CASSIMJEE, Farida & Charles W. KISSEBERTH 2001. Zulu Tonology and Its Relationship to Other Nguni Languages. In: Sh. KAJI (ed.) *Proceedings of the Symposium Cross-Linguistic Studies of Tonal Phenomena: Tonogenesis, Japanese Accentology, and Other Topics*: 327–359. Tokyo: ILCAA.
- CLARK, Mary 1988. An Accentual Analysis of the Zulu Noun. In: H. VAN DER HULST & N. SMITH (eds), *Autosegmental Studies on Pitch Accent*: 51–79. Dordrecht: Foris.
- CLAUGHTON, John Sellick 1992. *The Tonology of Xhosa*. PhD dissertation, Rhodes University.
- COPE, Anthony Trevor 1970. Zulu Tonal Morphology. *Journal of African Languages* 9(3): 111–152.
- CRANE, Thera, Stephan SCHULZ, Lotta AUNIO & Axel FLEISCH 2019. IsiNdebele Grammar Sketch. Manuscript, University of Helsinki.
- DONNELLY, Simon Scurr 2009. *Aspect of Tone and Voice in Phuthi*. PhD dissertation, University of Illinois.
- DOWNING, Laura J. 1990. Local and Metrical Tone Shift in Nguni. *Studies in African Linguistics* 21(3): 261–317.
- DOWNING, Laura J. 2001a. How Ambiguity of Analysis Motivates Stem Tone Change in Durban Zulu. *UBC Working Papers in Linguistics* 4: 39–55.
- DOWNING, Laura J. 2001b. Ungeneralizable Minimality in Ndebele. *Studies in African Linguistics* 30(1): 33–58.
- DOWNING, Laura J. 2004. What African Languages Tell Us about Accent Typology. *ZAS Papers in Linguistics* 37: 101–136.
- DOWNING, Laura J. 2009. On Pitch Lowering Not Linked to Voicing: Nguni and Shona Group Depressors. *Language Sciences* 31: 179–198.

- DOWNING, Laura J. & Lotta AUNIO 2018. High-Tone Rejecting Syllables in isiNdebele. Paper presented at the ACAL 49, Michigan State University, 22 Mar. 2018.
- GOLDSMITH, John, Karen PETERSON & Joseph DROGO 1989. Tone and Accent in the Xhosa Verbal System. In: P. NEWMAN & R. BOTNE (eds), *Current Approaches to African Linguistics*: 157–177. Dordrecht: Foris.
- HYMAN, Larry M. 2001. Privative Tone in Bantu. In: Sh. KAJI (ed.) *Proceedings of the Symposium Cross-Linguistic Studies of Tonal Phenomena: Tonogenesis, Japanese Accentology, and Other Topics*: 237–257. Tokyo: ILCAA.
- JOKWENI, Mbulelo Wilson. 1995. *Aspects of Isixhosa Phrasal Phonology*. PhD dissertation, University of Illinois.
- KHUMALO, James Steven Mzilikazi 1987. *An Autosegmental Account of Zulu Phonology*. PhD dissertation, University of the Witwatersrand.
- MONARENG, William Malakia 1993. *A Domain-Based Approach to Northern Sotho Tonology: A Setswapo Dialect*. PhD dissertation, University of Illinois.
- MYERS, Scott 1999. Tone Association and Fo Timing in Chichewa. *Studies in African Linguistics* 28(2): 215–239.
- RYCROFT, David K. 1963. Tone in Zulu Nouns. *African Language Studies* 4: 43–68.
- RYCROFT, David K. 1980a. Ndebele and Zulu: Some Phonetic and Tonal Comparisons. *Zambezia* VIII(ii): 109–128.
- RYCROFT, David K. 1980b. Nguni Tonal Typology and Common Bantu. *African Language Studies* 17: 33–76.
- RYCROFT, David K. 1983. Tone-Patterns in Zimbabwean Ndebele. *Bulletin of the School of Oriental Studies, University of London* 46(1): 77–135.
- SCHULZ, Stephan *forthcoming*. The Phonology of isiNdebele. PhD dissertation, University of Helsinki.
- SIBANDA, Galen 2004. *Verbal Phonology and Morphology of Ndebele*. PhD dissertation, University of California.
- SKHOSANA, Philemon Buti 2009. *The Linguistic Relationship between Southern and Northern Ndebele*. PhD dissertation, University of Pretoria.
- ZELLER, Jochen, Sabine ZERBIAN & Toni COOK 2017. Prosodic Evidence for Syntactic Phrasing in Zulu. In: J. VAN DER WAL & L.M. HYMAN (eds), *The Conjoint/Disjoint Alternation in Bantu* (Trends in Linguistics, Studies and Monographs 301): 295–328. Berlin: De Gruyter.
- ZERBIAN, Sabine 2006. High Tone Spread in the Sotho Verb. In: J.M. MUGANE, J.P. HUTCHISON & D.A. WORMAN (eds), *Selected Proceedings of the 35th Annual Conference on African Linguistics*: 147–157. Somerville, MA: Cascadilla Proceedings Project.
- ZERBIAN, Sabine & Etienne BARNARD 2008. Phonetics of Intonation in South African Bantu Languages. *Southern African Linguistics and Applied Language Studies* 26(2): 235–254.
- ZERBIAN, Sabine & Etienne BARNARD 2009. Realisations of a Single High Tone in Northern Sotho. *Southern African Linguistics and Applied Language Studies* 27(4): 357–379.