

High Tone Shift in KiNyamwezi

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1. INTRODUCTION

KiNyamwezi is a member of a large Bantu dialect cluster, the largest one in Tanzania. It stretches from Lake Victoria in the north to Lake Rukwa in the south, a distance of about 700 km. The northernmost and by its number of speakers most important member of this cluster is KiSukuma; the other members are less well described. In Guthrie's referential classification the Sukuma-Nyamwezi group has the cipher F.20 and comprises the following members:

- F.21 Sukuma
- F.22 Nyamwezi
- F.23 Sumbwa
- F.24 Kimbu
- F.25 Bungu

"High Tone Shift" (HTS) is the name of a process by which a high tone is delayed, or "displaced to the right". HTS is the major, general tone rule of KiNyamwezi. In this paper, I describe what I have come to understand about this process as it occurs in KiNyamwezi. The data on which this paper is based were established in cooperation with Clement Maganga, of the University of Dar es Salaam.

2. THE FACTS OF HIGH TONE SHIFT PROPER

Within a word, a high tone is generally realized not on the vowel to which it inherently belongs, but one mora later (1a). This is also true for each high tone in a sequence (1b). When a high tone is shifted out of the word-initial position, the word-initial syllable is realized with a low tone (1c). A single high tone in word-final position is also shifted to the right, which results in a word-final rising tone with concomitant vowel length (1d). No such vowel lengthening occurs when there is a word-final sequence of two (or more) high tones; in fact, it is impossible to distinguish a word-final sequence of basic °HH from °HL (1e).

- | | | | | |
|--------|----------------|---|------------|-------------------|
| (1) a. | °ku-lol-a | > | kolola | 'to look' |
| | °ku-Bá-lol-a | > | kuβalóla | 'to look at them' |
| | °ku-láβul-a | > | kolaβóla | 'to hurt' |
| b. | °ku-Bá-láβul-a | > | kuβaláβóla | 'to hurt them' |
| c. | °Bá-ku-lola | > | βakólola | 'they will look' |
| d. | °a-laa-lol-é | > | alaaloleé | 's/he will look' |
| e. | °a-laa-Bón-é | > | alaaBoné | 's/he will see' |
| | °ku-Bón-a | > | kuβoná | 'to see' |

KiNyamwezi has two kinds of long vowels. The first kind results from vowel sequences, which turn out either as just a long vowel or as a glide-plus-long-vowel sequence, depending on the quality of the two vowels involved. However, there are no long vowels in word-final position unless there is also a contour tone. The second kind results from automatic lengthening before a prenasalized consonant, except in word-initial position. HTS operates as expected on two-vowel sequences: a basic high tone on the first vowel is realized on the second (2a). A basic high tone on a vowel which is followed by a prenasalized consonant produces a different result: there is a rising contour on the lengthened vowel, and in addition the vowel of the next syllable also carries a high tone (2b).

- (2) a. °ku-léet-a > koleéta 'to bring'
 °ku-lúal-a > kulwaála 'to fall ill'
 b. °ku-βínzúk-a > kuβínzúka 'to break' (itr)

It has been said that a word-initial vowel is not lengthened when followed by a prenasalized consonant. In this environment, there is also no rising contour (3a). More revealing is what happens in a sequence of two adjacent vowels followed by a prenasalized consonant. Such sequences are excluded within a morpheme but do occur across morpheme boundaries. Two things can be noted in such cases. First, there are no triple-long vowels, and second, a basic high tone preceding the prenasalized consonant is realized not as a rise but only on the next syllable (3b).

- (3) a. °úm-b-ag-á > umbágaá 'sing!'
 b. °ku-úm-b-a > kwumbá 'to sing'

When a high tone is shifted onto a syllable with a long vowel, the general rule is that both moras become high. The examples in (4) show the long vowel as part of the progressive TAM-marker °-lu-, as the lengthened vowel of the (rare) extension °-ung-, and as the lengthened root vowel of °-lond-.

- (4) °Bá-lu-lol-a > Balúlola 'they are looking'
 °ku-βílung-a > kuβilúnga 'to assemble'
 °ku-Bá-lond-a > kuBalónda 'to follow them'

However, HTS is blocked when it would place the high tone onto a basically low radical vowel of a CV-root, or a stem starting with CVVC. (Many CVVC-stems are transparently derived from CV-roots, others may be analysed analogically.)

- (5) °ku-yí-sh-a > koyísha 'to grind it'
 °ku-Bá-sh-el-a > kuBásheela 'to grind for them'
 °ku-Bá-kooβ-a > kuBákooβa 'to search for them'
 °ku-Bá-saagul-a > kuBásaagula 'to choose them'

The blocking of HTS can have consequences earlier on in the same word. A sequence HLH1, where 1 indicates blocking of HTS, is the only environment producing either a downstep or a falling tone, depending on whether the intermediate low-toned syllable is either short or long.

- (6) °Bá-ku-yí-kooB-a > Bakó'yí'kooBa 'they will look for it'
 °Bá-lu-yí-kooB-a > Balí'yí'kooBa 'they are looking for it'

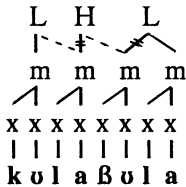
3. FORMULATION OF HIGH TONE SHIFT PROPER

We are now ready to suggest a formulation of HTS. We select the mora as the Tone Bearing Unit because the behaviour of two-vowel sequences suggests that the basic TBU is smaller than the syllable, and tonal contours on long vowels (of either kind) demand that the TBU be a rhythmic unit rather than the vowel itself. The mora-building algorithm is simple: any CV is a mora, and any remaining weight unit is also a mora.

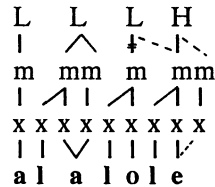
- (7) HTS: A high tone is delinked from its leftmost mora and spreads to the next V-based mora, which in turn is delinked from its tone. HTS is blocked when the next mora is a low-toned CV(VC)-root.

The following examples demonstrate the application of HTS. (8a) presents the simplest case; note that the extension -ul- is linked to the tone of the Final infinitive morpheme -a. (8b) shows the creation of an extra mora in final position by a stranded (floating) high tone.

(8) a. [kulaBóla]



b. [alaaloleé]



In (9), we see the HTS applied to two-vowel sequences. (9a) may be analysed as having a sequence of two identical vowels. (9b) has two different vowels; the first one loses its weight (it is pronounced as a glide), and there is compensatory lengthening of the second vowel. After HTS, the long vowels in (9a) and (9b) are both linked to tonal sequences LH. Note that the second stem vowel behaves tonally just like an extension: it takes its basic tone from the Final morpheme.

(9) a. [kuleéta]

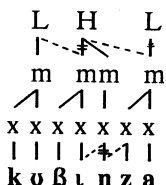


b. [kulwaála]

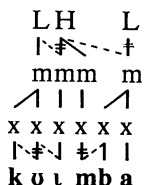


HTS involving long vowels before prenasalized consonants is shown in (10). It seems reasonable to derive the length of such vowels from the weight of the following nasal. (10a) represents the simple case. (10b) shows the case of an underlying sequence of three moras which end up as a single, two-mora syllable. The proposed derivation identifies the nasal-based mora (with its associated high tone) as the one that is left out because it has no segmental support.

(10) a. [kuβúnzá]

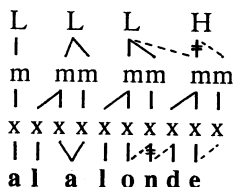


b. [kwumbá]



Since nasal-based moras never carry a lexically distinctive tone we have to decide from where such moras receive their tonal specification once that mora is transferred to the adjacent vowel. The example in (11) shows that the tone of this mora is taken from the adjacent vowel to the left, i.e., from the tauto-syllabic vowel. If it were taken from the vowel in the next syllable, the form would surface not with a rising but with a level-high tone on the final vowel. This shows that nasal-based moras do not behave as verbal extensions.

(11)



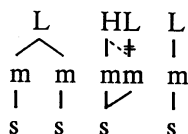
[alaaloondeé] 's/he will follow'

The examples in (12) concern cases where HTS places a high tone onto the first mora of a long vowel. In (12a), HTS alone produces the wrong output in the form of a falling high-low contour on the long stem vowel. We therefore need to introduce another rule which is known as "absorption" or "contour simplification". This rule, which I call NO-FALL, reduces a HL-contour on a single syllable to H. (12b) demonstrates the application of NO-FALL to the output of (12a).

(12) a. HTS > [*kuβalónda]



b. NO-FALL > [kuβalónda]

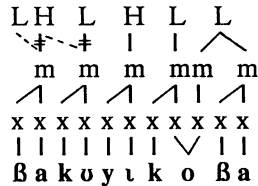


NO-FALL – as (13a) below shows – depends on the presence of a following linked low tone. NO-FALL is different in kind from HTS. First, it depends crucially on the structure of the syllable. Second, and again quite unlike HTS, NO-FALL eliminates a non-permitted surface structure and hence qualifies as a repair rule, or rather a structure condition with an associated automatic rule (cf. Stewart 1983).

HTS is blocked by the low-toned CVVC-stem in (13). However, HTS does apply to the high tone of the initial °Bá-. In (13a) this results in a falling tone on -í-; NO-FALL cannot apply since the next TBU has a high tone. In (13b), HTS itself creates a floating low tone which is realized as a downstep.

(13) a. [Balíyíkooβa]

b. [Bakó'yíkooβa]



The examples in (13) also show the creation of a default low tone in initial position. Note that other low tones have to be present prior to HTS; I see no reason to accord any kind of default status to low tones in general.

4. NO HL#

Still, there are consistent differences in the way that high and low tones behave. In (14) we see words whose final tone is delinked by HTS. In (14a), the basic final tone is low, and after being dislodged and losing its segmental support it disappears without a trace. In (14b), the basic final tone is high, and when it is shifted to the right it is not lost but relinks to the end of the word, and even creates its own mora.

- (14) a. °mu-súl-i > ñsuzí 'blacksmith'
 b. °Bu-seβ-ú > Buseβuú 'heat'
 c. °Bu-hól-ú > Bohozú 'peace'

In derived words such as those used in (14), the underlying tones of each morpheme and hence each vowel are known by substitution. Thus, the inherent low tone of the agent noun suffix -i can be seen unambiguously in a word such as ñlumi 'farmer', derived from °mu-lum-i. However, underived stems of two or more syllables with a LH melody on the last two syllables are ambiguous as to their underlying tone: it could be either °HL or °HH; compare (14a) and (14c) above. To avoid this ambiguity, which is, I believe, unsustainable not just by linguists but also by the speakers, I suggest that there is a word structure condition which rules out word-final °HL (prior to HTS) in favour of °HH. Below I will give reasons why I choose this rather than the other logical possibility to resolve this ambiguity.

realizing a floating low tone as a downstep appear not to be available after HTS across a word boundary.

- (17) a. **ndimú ykápeelife** ‘the animal did not run’
compare: **ndimú ytkalólife** ‘the animal did not look’
b. **ndimú yaalóla** ‘the animal looked’ (< °... yí-á-lol-a)
lolagá lwaalá ‘look at the finger’ (< °... lu-álá)

The third blocking environment for HTD is more complex. It involves verbs starting with two low tones on one syllable; see (18a). Non-verbs of identical phonological shape do not block HTD; compare the examples in (18b) which also show that NO-FALL does apply to the output of HTD.

- (18) a. **ndimú yuolola** ‘the animal will look’
cf. the fuller form of the same tense: **ndimú ytkolola**
b. **ndimú yáá-komapoólú** ‘the animal of (in) the bush’
lolagá lóóyaá ‘look at the feather’ (< °... lu-oyá)

The question arises whether HTD is blocked or applied vacuously in those environments where the next word begins with a high tone for which HTS is blocked; for an example see (15d). The answer is: it does apply vacuously. That this is so can be seen when looking at words with final (surface) rising tone. Blocking of HTD preserves the final high tone in its underlying position; vacuous application of HTD results in a merger of the two adjacent high tones: °H#Hl > L#H. The two cases are exemplified in (19a) and (19b). In fact, the same thing happens to a sequence HHI without an intervening word boundary; see (19c).

- (19) a. **mbogó yuolola** ‘the buffalo will look’
ɲaaʼBó yuolola ‘the cat will look’
compare: °mbogó > **mbogó** ‘buffalo’
 °ɲaaBó > **ɲaaʼBó** ‘cat’
b. **mbogo yímo** ‘one buffalo’
ɲaaʼBó yímo ‘one cat’
c. °Bá-í-suuhíjé > **Bíisuuhíjé** ‘they have rested’

The facts about blocking of HTD, in as far as they differ from the environment in which HTS is blocked, pose a problem to the proposal to regard HTD simply as a part of (post-lexical) HTS. The best I am able to suggest is to accept that HTS is sensitive to the position of the word boundary, while maintaining the analysis that there is but a single process of HTS which operates on the phonological phrase rather than on single words.

6. TONAL LIAISON

Liaison occurs when a word ends in a vowel (which all words do), and when the next word begins either with a vowel or with a prenasalized consonant. Liaison affects consonants, vowels, and also tone in a way which is different from what happens at otherwise comparable morpheme junctures within the word.

Liaison may produce sequences of consonants and glides which are not found elsewhere in the language. This is the case for the CGV sequences *ɓwV*, *mwV*, *syV* and *zyV*, as in (20a) and (20b), and also for the CGGV sequences *CwyV* and *CywV*, as in (20c).

- (20) a. *ɲaáɓó + ɪyɪ > ɲaáɓw'íyɪ* 'this cat'
ndimú + ɪyɪ > ndimw'íyɪ 'this animal'
 compare: *°ɓu-átó > waató* 'boat'
°mu-ńló > ɲwuló 'light-coloured person'
- b. *mkáasi + ugu > mkáasy'ugugu* 'these scissors'
mgazi + ugu > ngazy'ugugu 'this blood'
ɓookí + úɓu > ɓook'úóɓu 'this honey'
 compare: *°ku-lás-i-a > kulashá* 'to make shoot'
°l-zi-o > ɷjo 'these' (class 10)
°l-ki-o > ɷcho 'this' (class 7)
- c. *matwíí + aɓílí > matwy'aabílí* 'two ears'
Banhu Báa-Bólyw'aaɓa (cf. *Bólyo*) 'right-handed people'

Liaison produces long vowels, which is not surprising given that it occurs in the same environments, CVV and VNC, which word-internally trigger compensatory lengthening. This is shown in (21a) and (21b). Note that, without liaison, no long vowels are admitted in word-final position (unless coupled with a contour tone), even when there is a CGV-sequence. This constraint holds true not just for isolated words but also when such words are used in connected speech; there is no way to pronounce the final vowel of the first word in (21c) long, no matter how fast the speech and how closely the two are connected.

- (21) a. *nzoká + ɪyɪ > nzok'íyɪ* 'this snake'
ndimú + ɪyɪ > ndimw'íyɪ 'this animal'
- b. *nguko + ndaki > ngukoo ndaki* 'a brave baboon'
- c. *maswa maliihú* 'long grass'

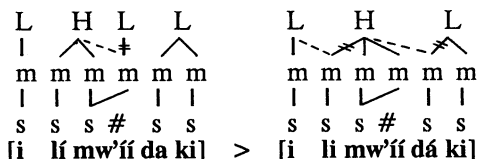
Tonal Liaison (TL) is particularly interesting since it clearly involves more than just combining the tones of the two merging syllables. In (22), four nouns with different tonal shapes are combined with an all-low adjective, *idaki*. The plural forms, which have the same basic tones but are not subject to liaison, are added for comparison.

- (22) a. *igokw'iidaki* 'a brave baboon' (cf. *magoko madaki*)
 b. *ilimw'íidáki* 'a brave animal' (cf. *malimú mádaki*)
 c. *iɓogw'íidáki* 'a brave buffalo' (cf. *maɓogo mádaki*)
 d. *ɷɲaáɓw'íidáki* 'a brave cat' (cf. *maɲaáɓu mádaki*)

The most surprising effect of TL is the spreading of the word-final high tone up to the second syllable of the next word. If we assume that non-TL forms are derived prior to TL then, superficially, it appears as if either a second application of HTS was taking place, or as if the word boundary had moved to the right. However, it is possible to include TL into (post-lexical) HTS if we assume that syllabification is also a phrasal rather than a word level process. The proposed derivation of the example in (22b) is given in (23).

(23) NO HL#:

HTS:



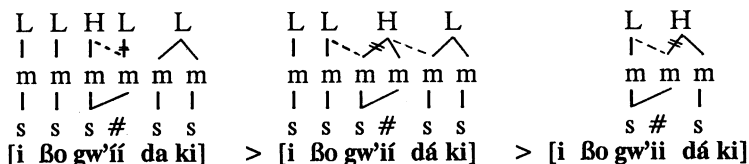
It is crucial that the NO-HL# condition re-apply at the phrase level. This is what creates the third high-toned mora, whereas there are but two high moras in the underlying form. The position of the word boundary is determined at the level of the syllable. We may say that part of the syllabification process consists in realigning the word boundary with the syllable boundary. Otherwise, the syllabification algorithm is simple: Any branching mora builds a syllable; any non-branching mora joins the preceding syllable, except that a phrase-initial non-branching mora must form a syllable by itself.

There is one more complication. The proposed mechanism, consisting of the (recurring) NO-HL# condition plus phrasal HTS, does not yet produce the correct output for the forms given in (22c) and (22d) where the first word ends in LH. Here we need an additional process of word-final contour simplification, this time excluding a rising contour. NO-RISE is a condition with an associated automatic rule which replaces a word-final rising contour tone by a level low tone when it is followed by another high tone. We have tentatively described such a "process" in the context of HTD; compare (17c) and (17d). However, at that point, its formulation was made redundant by positing HTS as a phrasal process. Now, in the context of TL, the introduction of NO-RISE becomes a necessity. The proposed derivation of the example in (22c) is shown in (24).

(24) NO HL#:

HTS:

NO-RISE:



As far as I can see, the proposed formulation of HTS and its associated ramifications of blocking and conditions restricting contours account also for other cases of liaison. Some relevant data are provided in (25). The same nominal stems are used as above; the class 5 forms in (a) and (b) provide the liaison environment V#V, the class 9/10 forms in (c) through (g) create the other setting for liaison in the environment V#NC. In addition to the all-low adjective stem **-daki** 'brave' I use the stems $^{\circ}$ -**bótú** > **-botú** 'strong' and **-hápa** 'big'. The latter is the only adjective stem that starts with a high tone on the surface; I assume that it has the (exceptional) underlying form $^{\circ}$ -**hápa**. The examples in (f) and (g) add two types of forms with CV(VCV)-stems $^{\circ}$ -**gééhú** > **-geéhú** 'few' and $^{\circ}$ -**dó** > **-doó** 'small'.

- (25)
- | | | |
|---|---|--|
| | a. igokw'iibotú
ilimw'íbotú
iBogw'íbotú
luṅaáḅw'íbotú | b. igokw'iihána
ilimw'íihána
iBogw'íihána
luṅaá'ḅw'íihána |
| c. ngokuu ndaki
ndimúú ndáki
mbogoo ndáki
ṅaáḅuu ndáki | d. ngokuu mbotú
ndimúú mbotú
mbogoo mbotú
ṅaáḅoo mbotú | e. ngokuu ṅhána
ndimúú ṅhána
mbogoo ṅhána
ṅaá'ḅoo ṅhána |
| | f. ngokuu ngeéhu
ndimúú ngeéhu
mbogoo ngeéhu
ṅaáḅoo ngeéhu | g. ngokuu ndoo
ndimúú ndoo
mbogoo ndoo
ṅaáḅoo ndoo |

7. CONCLUSIONS

The present account includes a number of proposals, some new and some already made earlier, which may be significant in a more general perspective.

(i) A distinction is made between proper phonological rules and conditions with associated automatic rules. A-rules were introduced by Stewart (1983); I have combined them with specific proposals about redundancy conditions (Schadeberg 1986). The difference between P-rules and A-rules has some bearing on the phoneme issue. Redundancy conditions and their A-rules determine and correct an unadmissible phonological structure, and by implication define what is admissible. P-rules have no such relation to the general phonological structure of the language.

The present analysis proposes one P-rule, HTS, and three conditions correcting unadmissible tonal contours: NO-HL#, NO-FALL (NO HLL), and NO-RISE (NO LH#H). NO-FALL and NO-RISE refer to the syllable structure and (I would like to add: hence) are only applicable at the phrasal surface level. NO-HL# has no specific reference to the syllable, and it applies and re-applies in the underived lexicon, in the derived lexicon, and at the phrase level. These three cases are shown in (26); the correct surface forms after the application of HTS are given below in square brackets.

- (26) a. L H
| |
m mm#
°i- li mu
- b. L H L
| |
m m m#
°ku-ḅon-a
- c. L H L L
| ^ |
m m mm mm
| | | |
s s s # s s
°ku-ḅon-a i-goku
- [i li mú] [ku ḅon á] [ku ḅon' í góku]

(ii) Throughout this paper I have found it appropriate to use the XMS-model for presentation. This model combines ideas taken from Clements and Keyser 1983 and from Hyman 1985. In this model (cf. Schadeberg 1987)

there are three hierarchical levels: the basic weight unit (X), the mora (M), and the syllable (S). While the description of tone in KiNyamwezi must refer to each of these three levels, and in addition to the major segment classes C, V and N, it is apparent that the mora is the true bearer of tone (TBU). In particular, the syllable cannot be the TBU, at least not until HTS has applied, since HTS can only be stated properly at the level of the mora. After HTS has applied, the syllable seems to be the reference unit for the two conditions on contours: NO-FALL and NO-RISE.

(iii) KiNyamwezi offers new insights into the nature of "liaison". There is more involved than just producing "closed junctures" across word boundaries. The facts that word-final CGV-syllables have short vowels even in closely connected speech, and that HTS (including HTD and TL) crucially follows liaison, make it possible to define liaison as precisely those cases where syllabification joins phonic material from two adjacent words in one syllable. We have also seen that syllabification makes the word boundary percolate "upward" to the syllable level, and that liaison restores the synchrony between word and syllable boundaries.

(iv) We have seen that KiNyamwezi takes great trouble – to the extent of creating the two otherwise unused tonal configurations of falling contours and downsteps – in order to preserve as well as possible the basic melody. I think that this "melodic stability" is a widespread tendency; it might be worthwhile to reconcile it with Hyman's "principle of ups and downs" (1978:261): "Tonally induced changes tend to minimize the number of ups and downs over a given stretch."

(v) According to Hyman (1978:260), HTS is a complex process in historical perspective. It involves first two applications of (high and low) tone spreading, and then two applications of contour absorption.

(27) base form: L H L L
 by spreading > L LH HL L
 by absorption > L L H L

The base form and the final result in (27) are exactly what can be postulated for and found in KiNyamwezi: the basic high tone is shifted one position to the right. In KiSukuma (Batibo 1985), HTS results in the displacement of the basic high tone by two positions.

(28) KiNyamwezi ***kodégeleka** > **kodegéleka** 'to hear a case'
 KiSukuma ***kudókanana** > **kudukanána** 'to insult each other at length'

So far, no dialectal evidence has been reported attesting any contour tone stage either prior to the first HTS as evidenced in KiNyamwezi, or preceding the second HTS of KiSukuma. I plan to carry out a survey on the dialectal variations of HTS in the whole Sukuma-Nyamwezi language group. From this I hope to draw conclusions about the historical development of this process, and also to find arguments for the most appropriate synchronic account.

(vi) Finally, it occurs to me that the phrasal nature of HTS on the one hand, and the detailed morphological information which is necessary for the formulation of the blocking of HTS on the other, will make it difficult to reconcile the present account with the spirit of lexical phonology.

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