

Privative Tone in Bantu

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“Whenever a system consists of two contrasting entities, the analyst may suggest an alternative interpretation whereby one of the entities is ‘zeroed out’ and the contrast is regarded as presence vs. absence of some one positive entity.” (Stevick 1969:330)

1. Introduction

The purpose of this paper is to address the issue of “zeroing out” a tone in the above sense: When is an opposition properly analyzed as the presence vs. absence of a tone, rather than two different indications of tone, e.g. a + vs. - of a tone feature?¹ Although phonetic pitch (Fo) is scalar in nature, phonological (categorical) tone frequently has a privative character. The most frequent situations involving languages with binary or ternary oppositions are summarized in (1).

(1)	Phonetic Opposition	Phonological Opposition	Examples
a.	[H] vs. [L]	/H/ vs. /Ø/	Slave, Navajo, Somali, Paicĩ
b.	[H] vs. [M] vs. [L]	/H/ vs. /Ø/ vs. /L/	Fasu, Yoruba

As indicated in (1a), languages such as Slave, Navajo, Somali and Paicĩ, which oppose two tone levels, have a phonological system where a tone-bearing unit (TBU) is either H or toneless—the latter usually being realized on a lower pitch than H. In other languages such as Fasu and Yoruba in (1b), which oppose three tone levels, a TBU is either /H/, /L/ or /Ø/, the latter realized on a M(id) tone level.² In such cases we can speak of a “marked” H vs. “unmarked” L in (1a), and of an unmarked M in (1b).

While (1) represents the most common markedness situation for two- and three-level tone systems, there are other possibilities such as those in (2).

(1)	Phonetic Opposition	Phonological Opposition	Examples
a.	[H] vs. [L]	/Ø/ vs. /L/	Dogrib, Sekani, Jabem, Dubea
b.	[H] vs. [L]	/H/ vs. /L/ vs. /Ø/	Margi, Nande
c.	[H] vs. [M] vs. [L]	/Ø/, /L/	Engenni
d.	[H] vs. [M] vs. [L]	/H/, /L/	Kom

In (2a), which should be compared to (1a), a two-tone system is analyzed as the presence vs. absence of /L/. As stated by Maddieson (1978:342), “Systems in which high tones are marked are more frequent than systems in which low tones are marked,” but the latter clearly exist. Thus, Dogrib, Sekani, Jabem and Dubea all have tone systems of this sort.³

¹This paper was originally presented at a workshop on tone in European languages at the University of Constance, Dec. 15-18, 1999. I am grateful to Aditi Lahiri and others at that workshop for their helpful comments and shared enthusiasm about tone.

²Pulleyblank (1986) and Akinlabi (1984) present arguments for Yoruba. May & Lowecke (1964) analyze Fasu as having /H/ vs. /L/ on a stressed syllable, all other syllables being “marginal” (read: “toneless”), generally realized on a pitch between H and L.

³Since Slave, Navajo, Dogrib and Sekani are all Athapaskan languages, this is our first indication that languages in the same family can have reverse markedness relations in tone (cf. Rice 1999). The same

The remaining systems in (2) represent some of the other possibilities. Some languages such as Margi and Nande in (2b) have a ternary underlying representation, where /Ø/ receives either a H or L by rule. In Engenni in (2c), /L/ is marked, and /Ø/ is realized M unless it is followed by a L, in which case it is realized as H.⁴ Finally, Kom in (2d) is another case of an underlying binary system that is realized H, M, L on the surface—and also indicates that there needn't be an underlying, unmarked tone at all.

Restricting attention to two-tone systems, a logical question is: Why is /H/ vs. /Ø/ more frequent than /L/ vs. /Ø/?⁵ This question is of considerable theoretical and typological interest, as it is related to several other questions:

What is a possible tonal opposition? Tone system? (including the question of tone vs. “pitch-accent”—see the appendix).

Why are some tonal oppositions/systems found more frequently than others?

What does the alleged markedness asymmetry between H and L tell us about tone features? About feature theory in general?

How is tone the same/different from other features?

In the following sections I shall first discuss privative /H/ tone in Bantu, then privative /L/. The paper concludes with a brief comparison of the tonal results with segmental features.

2. Privative H in Bantu

The first question that must be addressed is: How can we tell if a tone is “marked” and hence analyzed as a privative feature? Maddieson (1978:341) suggests the following criteria: text frequency, lexical frequency, dominance in assimilatory processes, and neutralized tones—“in a language where stress is a factor, tones in stressed syllables are marked in relation to their replacements in unstressed positions.” The other side of this question is, of course: How can we tell if a tone is “unmarked”? In the simplest case, the answer is when the phonology refers conspiratorily to the marked tone /T/, and never to the unmarked tone /Ø/.⁶ The citation by Stevick (1969:330) with which I began concerns the marked nature of /H/ in many of the ca. 500 Bantu languages, which inform my paper as well. Let us, therefore, consider what we should expect of a /H, Ø/ tone system, as posited in such Bantu languages as Shona, Haya, Digo, Rundi, Cewa, Yao, Xhosa and many more.

can be said for Paiçī (marked /H/) vs. Dubea (marked /L/), spoken in New Caledonia (Rivierre 1978).

⁴Thomas (1974, 1978) analyzes the Engenni tone system in terms of H, L and “top”, the last being a raised H. I prefer the analysis in (2c).

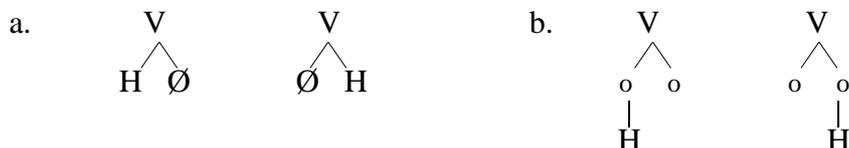
⁵One strategy in approaching this question is to rephrase it as: “What can a H(igh) tone do that a L(ow) tone can't?” We shall see that the answer to this question is “nothing”: Marked L has exactly the same properties as marked H.

⁶I consider that lexical or text frequency plays no direct role in determining markedness relations. Thus, although it is often said that L is marked in Hausa, it is not obvious from the phonological *behavior* of L that it is any more (or less) marked than H in that language. Of course, in a language that does contrast /H/ vs. /Ø/, it might be expected that the marked tone, H, would be less frequent than the default tone, L. Even here one must be careful: In Ganda, where L is much less frequent on the surface than H, it is the latter tone that is marked (see discussion below). Presumably the same would be true of Tokyo Japanese, which, like Ganda, may have fewer marked H's underlyingly, but many more H's than L's on the surface.

2.1. Contour tones

First, concerning tonal units, it should not be possible to have HL or LH contour tones in a language in which the opposition is /H/ vs. /Ø/. This is because, as seen in (3a), the combination of a /H/ and /Ø/ could only be pronounced [H]:

(3) If /H/ vs. /Ø/, then we should not get HL and LH contour tones

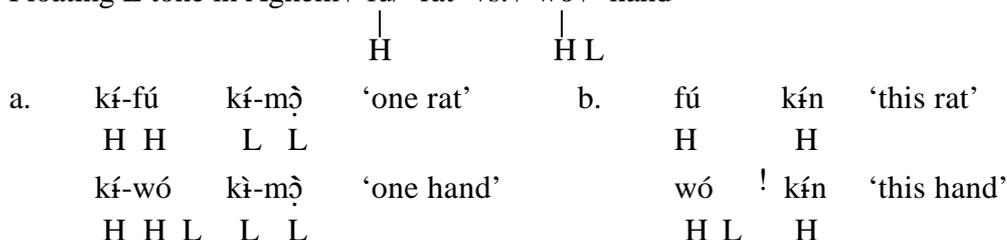


This generalization holds of several Bantu languages, e.g. Cewa, where there is one tone (H) per tone-bearing unit (TBU), and no evidence that L plays any role in the tonal phonology at all (Myers 1998). The important prediction of (3a) holds only if we assume a simple representation of tone, as in (3a), rather than a more articulated feature geometric representation such as in (3b). In the latter case it would be possible for a TBU to have two “tonal nodes,” one of which is underspecified, as seen.⁷ Assuming that (3b) is available, as many tonologists do, the failure to obtain HL and LH contour tones may have more to do with the constraint “one T per TBU” than with tonal markedness. One conclusion that we might draw is that the intuition that lack of contour tones implies that one of the involved tones is /Ø/ may, be erroneous—at least in the case of two-level tone systems. It is important to note, however, that this is one of Pulleyblank’s (1986) strongest arguments for the underspecification (unmarkedness) of M in the three-level tone system of Yoruba: Whereas (mostly derived) HL and LH contours exist in Yoruba, contours with M are prohibited (i.e. *MH, *ML, *HM, *LM). In cases where it appears that H or L combine with (unmarked) M, the result is [H] and [L]. Another possible response, which I prefer, would be to argue that there is no such thing as an empty tonal node, in which case the representation in (3b) would not be available.

2.2. Floating tones

A similar argument which must be subjected to the same scrutiny concerns floating tones, e.g. the floating L illustrated in the examples from Aghem, in (4).

(4) Floating L tone in Aghem /-fu/ ‘rat’ vs. /-wo/ ‘hand’



Whereas the nouns [kí-fú] ‘rat’ and [kí-wó] ‘hand’ are both pronounced H-H in isolation, it is clear that they have different effects on a following word. In (4a) we see that the H spreads onto the numeral in ‘one rat’, but not onto the numeral in ‘one hand’. The floating L of the stem /-wó/ is responsible for blocking H tone spreading (HTS). In (4b), where the deletion of the class 7 noun prefix /kí-/ is irrelevant, ‘this rat’ is pronounced H-H, while ‘this hand’ has a downstep between ‘hand’ and ‘this’. This downstep is caused by the same floating L that blocks HTS in ‘one hand’ in (4a).

⁷For two recent surveys and evaluations of various feature geometric approaches to tonal representation, see Bao (1999) and Snider (1999).

Aghem is a Grassfields Bantu language which has been analyzed with underlying /H/ vs. /L/ (Hyman 1987). Since /L/ is present underlyingly, there is no problem having the representation /-wó˘/, which consists of a TBU with linked H, followed by a floating (unlinked) L. On the other hand, if L = /Ø/, the intuition is that we should not get floating L tones, for what would it mean for there to be a floating “Ø” as in (5a)?

(5) If /H/ vs. /Ø/, then we should not get floating L tones



As in the case of contours, however, this prediction can easily be undermined in (5b), where the feature geometric approach allows the possibility of a floating tonal node whose absence of tone can later be spelled out with default L. Thus, whether a language allows floating tones or not may have less to do with tonal markedness than with the question of whether it tolerates tones (or tonal nodes) which are not linked to a TBU. Alternatively, if we prohibit empty tonal nodes, and hence representations such as (5b), we will be able to maintain the intuition that only specified tones can float.

2.3. Tonal distributions

The first two arguments concerning the presence vs. absence of contour tones or floating tones seem, therefore, to be inconclusive, resting as they do on assumptions one makes about the representation of tone. Let us consider now several arguments that have to do with the phonological *behavior* of the two contrasting tones in Bantu. I shall first consider the distribution of the two tones, then examine how they function in tone rules.

Concerning the distribution of H vs. non-H in Bantu, the following can be said:

First, underlyingly in Proto-Bantu and many present-day languages, /H/ may occur either on the first or last vowel of a stem, not in between. There is no corresponding constraint on where /Ø/ may or may not occur.

Second, many Bantu languages have morphological assignment rules, e.g. on verbs, which, according to the construction (e.g. clause type, tense/aspect, polarity etc.), a H is assigned to a specific mora. In Proto-Bantu this was the final mora, but in present-day languages it can be the second, third or last mora of a verb stem (see Odden 1988, 1999 for discussion of several of these patterns). There is no corresponding assignment of L (i.e. /Ø/) tone in such languages.⁸

Third, there are surface restrictions on [H], but rarely (never?) on [L]. In Haya, for instance, [H] may not appear on a vowel immediately preceded or followed by pause. This is responsible for alternations such as in (6).

(6) In Haya, a H may not appear on a vowel adjacent to pause

⁸There are two important caveats to this general statement: First, while it is normally the case that H is assigned according to the specific construction, with L being assigned by default, there are constructions where a verb (stem) may have to be entirely toneless, i.e. where H is prohibited. In this case, any lexical or grammatical H tones are deleted. Second, there are Bantu languages in which the opposition is between /L/ vs. /Ø/ (see below). In these languages L can indeed be assigned in this way, while H (= /Ø/) cannot, as one would predict.

- | | | | |
|----|-----------|------------------------|------------------|
| a. | /ó-mu-tí/ | o-mú-ti | ‘tree’ |
| b. | | o-mu-tí gwange | ‘my tree’ |
| c. | | okubón’ ó-mu-tí gwange | ‘to see my tree’ |

As seen in (6a), the noun ‘tree’ has underlying /H-Ø-H/ tone. To derive the surface realization, [L-H-L], the H of the augment /ó-/ is deleted after pause, and the H of the stem /-tí/ ‘tree’ is anticipated onto the penultimate syllable (Hyman & Byarushengo 1984).⁹ In (6b) we see that the H of /-tí/ is realized on its own TBU, since the noun does not appear before pause. Similarly, (6c) shows that the H of the augment /ó-/ is also realized whenever it does not occur immediately after pause.¹⁰ There is no corresponding positional constraint on where [L] may appear in Haya, or in any other Bantu language with which I am familiar.

2.4. Tone rules

We therefore can conclude that distributional constraints, whether of underlying, lexical, grammatical, or surface tones, can be quite telling as to whether an opposition is /H/ vs. /L/ or /H/ vs. /Ø/. Similar arguments can be derived from the behavior of contrasting tones in tone rules: If the opposition is /H, L/, tone rules should refer to both tones; if the opposition is /H, Ø/, tone rules should refer only to H’s.¹¹ That this is true in Aghem, a language which was argued to have /H, L/, can be seen in the spreading of both H and L tones in the following example:

- (7) Aghem has both H- and L-tone spreading to the right (Anderson 1979)

/kí-kḡ	kí	bó	à	fí-ḡàm/	‘the servant is hitting the mat’
H L	H	H	L	H L	(servant-AGR-hit-PROG-mat)
∖	∖	∖	∖	∖	
kḡ	kḡ	bó	ó	fí-ḡàm	(incl. deletion of subject prefix kí- and L-HL L-L)

This contrasts with the situation found in many (Narrow) Bantu languages with a /H/ vs. /Ø/ opposition. In these languages, only H tones are manipulated in tone rules. Some of the most frequent processes affecting H tones are schematized in (8).

- (8) Many Bantu languages manipulate only H in tone rules

- a. spreading (perseverative/anticipatory)

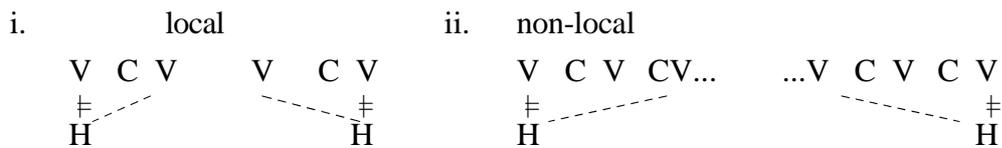
i.	bounded	ii.	unbounded
V	C V	V	C V CV...
	∖	∖	∖
H	H	H	H

⁹As Hyman & Byarushengo (1984) show, this takes place as a two-step process, anticipation and prepausal lowering: o-mu-tí o-mú-tí o-mú-ti.

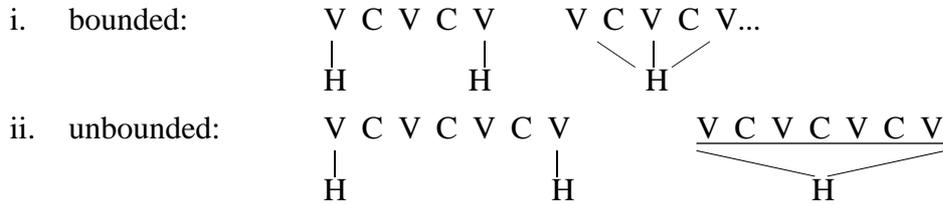
¹⁰The one complicating factor is that a H may be realized on a bisyllabic utterance if it derives from final position, hence: /é-n-te/ e-n-te ‘cow’, but /é-n-sí/ e-n-sí e-n-si é-n-si ‘country’.

¹¹In this case I shall ignore the complication posed by empty tonal nodes (representing /Ø/ in contrast to /H/), although it would be interesting to see if there are active rules that refer to them, e.g. convincing cases where an empty tonal node spreads and either delinks or contours with a H tonal node.

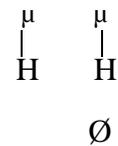
b. shifting/displacement



c. plateauing



d. reduction and dissimilation, e.g. “Meeussen’s Rule” (MR):



e. alternating patterns, e.g. Rundi (cf. Goldsmith & Sabimana 1986)

ku-sab-a ‘to ask for’	ku-báz-a ‘to ask (question)’
ku-bi-sab-a	ku-bí-baz-a
ku-bí-mu-sáb-a	ku-bí-mu-báz-a
ku-bí-mu-kú-sab-ir-a	ku-bí-mu-kú-bar-iz-a
ku-há-bi-mú-ku-sáb-ir-a	ku-há-bi-mú-ku-bár-iz-a
‘to ask him for them for you there’	

[-bi- ‘them’ (cl.8), -ku- ‘(for) you sg.’, -mu- ‘him/her’ (cl.1), -ha- ‘there’ (cl.16)]

As seen, H tones may spread (8a) either left-to-right or right-to-left, in either a bounded or unbounded fashion. They may shift (8b) either left-to-right or right-to-left, either locally or non-locally. There can be plateauing (8c) whereby toneless TBU’s become H between H’s, and there may also be reduction and dissimilatory processes affecting H tones, e.g. Meeussen’s Rule (MR) in (8d). Finally, there are a few cases of alternating patterns, e.g. in Rundi, where ku-há-bi-mú-ku-sáb-ir-a ‘to ask him for them for you there’ has one underlying H that is realized on every other mora.¹² In a /H, ∅/ system, the processes in (8a-e) could never target L, since L = /∅/.¹³ If the opposition were /H, L/ (or /L, ∅/—see below), it would be possible for L to figure in such rules.

¹²This alternating pattern only targets object prefixes and the first mora of the verb root. From comparative evidence we know that if there is one object prefix, it is toneless; if there are two, then one of the two has a H tone. In Rundi, we need only one /H/, but cannot determine which of a potential sequence of four object prefixes carries this H underlyingly. An appropriate analysis would therefore be a constructional one whereby a sequence of two or more object prefixes requires a H tone to be assigned, which then is realized on every other mora. This causes toneless verb roots such as -sab- ‘ask for’ to merge with H tone verb roots such as -báz- ‘ask (question)’. The same result would be obtained if we assumed an all-H domain from the first object prefix to the first root vowel, as in closely related Rwanda (Kimenyi 1988, Riailand 1988), which, in Rundi, is then subject to a left-to-right application of Meeussen’s Rule.

¹³This again assumes that “∅” does not consist of an empty tonal node. Perhaps this is where the argument should be directed: If the generalizations concerning /H, ∅/ are correct, then we need to prohibit empty tonal nodes outright.

can be accentual or not to Clements & Goldsmith (1984), Hyman (1978, 1989) and Odden (1999).¹⁵

2.5. Spell-out of unmarked L

To summarize thus far, I have established that there are good reasons for setting up a binary tonal opposition as /H/ vs. /Ø/ in many Bantu languages. The question that now arises is: What is the status of phonetic [L] in such languages? In fact, Bantu languages differ in the place in the grammar where [L] is introduced, as summarized in (12).

- (12) /H, Ø/ systems may differ in the place in the grammar within which [L] is introduced
- L = assigned in phonetic implementation (or not at all?), e.g. Cewa, Yao
 - L = assigned at the phrase level, e.g. Haya boundary L%
 - L = derived in lexical phonology, e.g. Ganda
 - L = underlying, unpredictable third value, e.g. Nande

First, there are languages such as Cewa (Myers 1998), where there is no evidence that the L plays any role in the phonology at all. Myers therefore proposes that L is introduced in phonetic implementation. The same proposal was made for Yao in Hyman & Ngunga (1994), where numerous complex tone rules, including phrasal ones, affect H tones without any reference to L, with one (“late”) exception: the L must be present to create the marginal occurrences of H-[!]H downsteps which exist in the language as a result of simplifying the LH rising tone when occurring in a prepenultimate H-LH sequence.

Second, L’s may be introduced at the phrase level. Such an example exists in Haya, where the ends of “assertive phrases” are marked by a L% boundary tone (Hyman & Byarushengo 1984). This tone has no audible effect when the phrase ends in Ø-Ø, as in (13a), which surfaces as L-L, exactly as it would have done if the L were assigned by default.

(13) Haya phrase-final L%

- | | | | |
|----|-------------------------------------|-------------------------|---------------------------|
| a. | /ba-ka-bon-a byarushengo/
H H L% | bá-ka-bón-a byarushengo | ‘they saw
Byarushengo’ |
| b. | /ba-ka-mu-bon-a/
H H L% | bá-ka-mu-bôn-a | ‘they saw him’ |

In (13b), however, where the phrase ends H-Ø, we do not obtain H-L, but rather HL-L, i.e. a HL falling tone on a single mora. Hyman & Byarushengo (1984) analyze this as a right-to-left spreading of the L% from final to penultimate position.

¹⁵One argument that comes up time and time again are the potentially culminative nature of a “pitch accent”, e.g. the HL drop in Tokyo Japanese, or the H that can occur on one of the last two moras of a word in Somali. This criterion, as applicable to Bantu, is examined in some detail by Odden (1999). Another potential criterion, mentioned also in the appendix, is the common interaction between tone and focus in Bantu languages, which I survey in Hyman (1999). The intuition here is that this interaction will be more prevalent, or typologically different, in a language that has a /H,Ø/ opposition vs. one which has /H,L/. In /H,Ø/ languages we expect rules that either delete H tones or lose a drop from H to L in [-focus] contexts. In /H,L/ languages, when there are tonal differences distinguishing [±focus], we expect these to be the result of grammatical tones (affixes) which occur in one vs. another focus context.

A third possibility is for the L's to be introduced in the lexical phonology. If analyzed as /H, Ø/, as in the second analysis in Hyman (1982), Ganda would need to have this property:¹⁶

(14) MR in Ganda: H-H H-L

- | | | | | | |
|----|-------------|-----------------|----|---------------|---------------------|
| a. | ba-li-lab-a | 'they will see' | b. | a-ba-li-lab-a | 'they who will see' |
| | H H H | | | H H H H | |
| | L L | | | L L L | |

As seen in (14a), MR applies in Ganda, affecting all but the first H of a contiguous sequence of input H tones. In certain Bantu languages (Shona, Tonga, Cewa etc.), MR is formulated as a deletion process, as in (8d) above. However, as shown by Hyman (1982) and Hyman & Katamba (1993), in Ganda, Meeusen's Rule produces L's that must not be allowed to merge with /Ø/. This is seen in a comparison of the two sentences in (15).

- | | | | | |
|---------|---------------|-----------|--------------------------|---------------------------|
| (15) a. | ba-li-lab-a | e-bi-kopo | 'they will see cups' | [bá-li-làb-á é-bí-kópò] |
| | \ | | | |
| | H L | H L | | |
| b. | a-ba-li-lab-a | e-bi-kopo | 'they who will see cups' | [à-bá-li-làb-à è-bì-kópò] |
| | \ / | | | |
| | H L | H L | | |

In (15a), the first word bá-li-làb-a 'they will see' (from (14a)) ends in a toneless vowel. As seen, the H of e-bi-kópò 'cups' spreads leftward onto this -a, converting the intervening e-bi- prefixes into H as well. The H of e-bi-kópò does not spread in (15b), however, where the verb form a-bá-li-làb-à 'they who will see' (from (14b)) ends in a L vowel (as the result of MR). As seen in the formulation from Hyman & Katamba (1993) in (16),

(16) High Tone Spreading (HTS):

- | | |
|---|--|
| TP[... PW[... C ₀ V ⁿ] [X V ...]PW ...] | (TP = tonological phrase;
PW = phonological word;
V ⁿ must be toneless) |
| | |
| H | |

tphrase-level HTS, which applies right to left in Ganda, will apply only if it can cross a phonological word (PW) domain. This occurs in (15a), where the FV is toneless, but not in (15b), where the FV carries a L tone. We therefore conclude that the L introduced in the lexical phonology must be kept distinct from /Ø/ in Ganda.

The same is true in Nande, where, as seen in (17a), an underlying /H/ is generally realized on the preceding vowel:

- | | | | |
|------------------------|------------------------|-----------------------|-----------------------|
| (17) Nande /H, L, Ø/ | Meeussen's Rule | H-anticipation | Noun + 'heavy' |
| a. /eki-rimɔ/ 'spirit' | | eki-rimɔ | ekí-rimɔ ki-líto |
| H | | H | H |
| b. /eki-koba/ 'rope' | eki-koba | eki-koba | ekí-koba ki-líto |
| H H | H L | H L | H L |

¹⁶The first analysis, similar to Stevick (1969b) and subsequently rejected in Hyman (1989), was to analyze Ganda with diacritic accents (asterisks), originally proposed by Goldsmith (1976). A third analysis starts with underlying /HL/ contours contrasting with /Ø/ (Hyman & Katamba 1993).

- c. /eki-ryatu/ ‘shoe’ eki-ryatu ki-lító
d. /eki-tsungu/ ‘potato’ eki-tsungu ki-lító
L L

As analyzed by Hyman & Valinande (1990), a lexical L results from any process that “removes” a H. This includes the stem-level operation of MR in (17b). This creates a phonological difference between ekí-rimù ‘spirit’ and ekí-kobà ‘rope’, which are realized identically as [L-H-L-L] in a “neutral” context, e.g. when followed by the adjective ki-lító. In addition, Mutaka (1994) proposes that /Ø/ also contrasts with an exceptional underlying /L/, in non-H words such as /eki-ryatu/ ‘shoe’ and /eki-tsungù/ ‘potato’. As seen in (17c,d), these both are realized [L-L-L-L] before ki-lító ‘heavy’. The reasons for this L/Ø opposition are seen in (18).

(18) The above lexical outputs in three end-of-phrase situations (Hyman 1990)

	end of phrase, e.g. as subject /_ H%	end of assertion, e.g. citation /_ H% L //	question/list intonation /_ H% H//
a.	ekí-rímù H H%	ekí-rímù H H%L//	ekí-rímù H H%H//
b.	ekí-kòbà H L	ekí-kòbà H L L//	ekí-kòbá H L H//
c.	ekì-ryátù H%	ekì-ryátù H%L//	ekì-ryátù H%H//
d.	ekì-tsùngù L	ekì-tsùngù L L//	ekì-tsùngù L H//

As indicated in the table, phonological phrases end in a H% boundary tone in Nande, while utterances can end in either L// (end of assertion) or H// (question/list intonation). The forms in the first column show how these four nouns are realized, for example, as a subject immediately preceding the verb. (18a) and (18b) show that the two nouns which are realized L-H-L-L before the adjective ki-lító in (17a,b) are now different. As subject, the H% is assigned to the last (toneless) vowel of ekí-rimù, while it cannot be realized on ekíkòbà because the latter ends in L. A similar story is observed in (18c,d), which concerns the two nouns which are realized L-L-L-L before ki-lító in (17c,d). As subject, these are realized ekì-rátù vs. ekìtsùngù, where, once again, the H% has linked to a final toneless vowel, but not to a final L. The second and third columns in (18) show that there can be sequences of boundary tones, H%L// and H%H// realized on the last two syllables in (18a, c), and that H// is always realized, even if it has to displace a final L in (18b, d).

In Nande, the underlying L tones are the exception, since most non-H tones are underlyingly /Ø/. The final situation is one where both /H/ and /L/ are present on all (or most) TBU’s from the very beginning. Kikuyu seems to be this kind of system (Clements 1984), since both H and L tones shift one TBU to the right, and since there is the possibility of floating tones (again, assuming no empty tonal nodes).

3. Privative L in Bantu

We have thus far seen a number of reasons why it is advantageous to analyze several Bantu languages with privative H tone. Numerous other examples from additional languages could have been presented as well to make the same point that /H/ is frequently the marked tone in Bantu, contrasting with /Ø/. In this section, I would like to consider the question of whether one can find cases in Bantu where the opposition is /L/ vs. /Ø/, i.e. where L is marked and H is the default tone. The logical place to look for such a system

is languages such as Luba, Ruwund, Kanyok, S. Kete, Shi, and Tembo, which have reversed the tones of Proto-Bantu. Some illustrations are given in (19).

(19) Comparison of Proto-Bantu, Phende, Luba, and Ruwund¹⁷

	‘root’	‘bow’	‘hunger’	‘tail’	‘hair’
Proto-Bantu	*-dì	*-tá	*-jàlà	*-kídà	*-sùkí
Phende	mù-zì	ù-tá	h-zàlà	mu-kílá	sùgí
Luba	mú-jí	bú-tà	h-zálá	mú-kílá	h-súkì
Ruwund	mú-j	ù-t	h-zál	mú-kìl	h-súc

The Proto-Bantu forms show two monosyllabic roots with *L and *H tone, respectively, as well as three bisyllabic noun stem patterns: *L-L, *H-L and *L-H.¹⁸ Phende represents a language that has kept the etymological tones (although it has changed *H-L to H-H). The forms from Luba, on the other hand, have the exact reverse tones of Proto-Bantu. The same is true of Ruwund, which is only partially obscured by the fact that most final vowels have been lost in that language (Nash 1992).

Given that the tones are reversed in Luba and Ruwund, the question that naturally arises concerns which tone is marked in those languages: the H that comes from PB *L (or *Ø), or the L that comes from PB *H? As shown by Nash (1992-94) and summarized in (20), all of the arguments are there that the Ruwund underlying system is /L, Ø/:

(20) Arguments for setting up /L/ vs. /Ø/ in Ruwund (Nash 1992-94)

- H’s are by far more numerous than L’s, hence “unmarked”
- floating L exists, while floating H does not
- morphological rules assign L tones, not H’s
- phonological rules manipulate L tones, not H’s

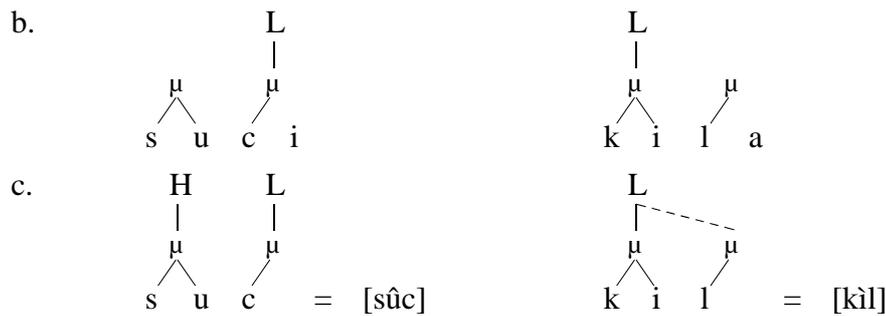
The fact that H tones are more numerous than L’s in Ruwund—vs. most Bantu languages—is suggestive, but not probative for the tonal analysis. That only floating L exists, but not floating H, is again compatible with the position that the opposition is /L/ vs. /Ø/ and possibly related to the fact that LH rising tones are not permitted in Ruwund, whereas HL falling tones are transparently derived from the loss of final vowels, as shown in (21).

(21) The contour tone issue: (i) why are there contours? (ii) why HL, but no LH?



¹⁷Phende forms were provided by Mwatha Ngalasso, while Luba and Ruwund forms are taken from Coupey (1954) and Nash (1991), respectively.

¹⁸The fourth pattern, *H-H existed but is not represented here. Note that for purposes of clarity in this section, I am starting with *L/*H rather than *Ø/*H.



As seen in (21a), the inputted noun stem /sucì/ ‘hair’ has an underlying /L/ on its last mora, while the noun stem /kìla/ ‘tail’ has an underlying /L/ on its first mora. The loss of word-final vowels is shown as a delinking process in (21b). As seen, this leaves a L linked to the moraic consonant [c], since /L/ is marked, but no tone on [l], since [H] is unmarked. As seen in (21c), default H is assigned to the first mora [sú], thereby deriving a HL contour on [súc]. In the case of [kìl], L spreads onto the mora of [l]. Whether this is because a default H cannot be assigned to a consonantal mora, or some other reason, the generalization is that a L of a lost vowel is preserved, while a H is not.

As in the case of marked /H/, in Ruwund it is the marked tone /L/ that is active in the statement of tonal distributions and tone rules. Thus, as seen in (22),

(22) The verb stem acquires tone by morphological assignment, e.g. all H in recent past

a.	/ni-a-pwiit-in-a/ /ni-a-bacik-in-a/ /ni-a-jikitiš-in-a/	n-a-pwiit-in n-a-bacik-in n-a-jikitis-in	‘I pulled’ ‘I pushed’ ‘I thanked’
b.	/u-a-pwiit-in-aañ-a/ /u-a-bacik-in-aañ-a/ /u-a-jikitiš-in-aañ-a/	w-a-pwiit-in-aañ w-a-bacik-in-aañ w-a-jikitiš-in-aañ	‘you pl. pulled’ ‘you pl. pushed’ ‘you pl. thanked’
c.	/ù-a-pwiit-ang-a/ /ù-a-bacik-ang-a/ /ù-a-jikitiš-ang-a/	w-à-pwiit-ang w-à-bacik-ang w-à-jikitiš-ang	‘I pulled’ ‘I pushed’ ‘I thanked’

verb stems do not receive any morphological tone in the recent past, and will therefore be realized with uniform default H.¹⁹ On the other hand, there is an active rule by which L spreads to the right within its domain, meaning either the prefix domain or the stem domain. In (23a) we see that the 1sg subject prefix *ni-* is toneless, hence the whole verb surfaces with default H:

(23) L tone spreads to the right within its domain, e.g. prefix domain, stem domain

a.	/ni-a-ma-mu.fut-ol-in-a/	n-a-ma-mu.fut-od-in	‘I paid him a lot for them’
b.	/wu-a-ma-mu.fut-ol-in-a/ ↓ L	w-à-mà-mù.fut-ol-in ↘ L	‘she paid him a lot for them’

¹⁹Recall from note 8 that marked-H languages may have the analogous situation where a verb stem may be uniformly realized with default L tone.

This contrasts with the situation in (23b), where the 3sg subject prefix /wù-/ has an underlying L (the reverse of Proto-Bantu *H). As seen, this L spreads onto the following prefixes.

In (24) we see that the /L/ of the tense prefix /-à-/ shifts onto the first syllable of the verb stem in the near past:

(24) The verb stem acquires the L of the tense prefix /-à-/ in the near past

a.	/ni-à-pwiit-ang-a/	n-a-pwìit-ang	‘I pulled’
	/ni-à-bacik-ang-a/	n-a-bàcìk-ang	‘I pushed’
	/ni-à-jikitiš-ang-a/	n-a-jìkìtìš-ang	‘I thanked’
b.	/wu-à-pwiit-ang-aañ-a/	w-a-pwìit-ang	‘you pl. pulled’
	/wu-à-bacik-ang-aañ-a/	w-a-bàcìk-ang	‘you pl. pushed’
	/wu-à-jikitiš-ang-aañ-a/	w-a-jìkìtìš-ang	‘you pl. thanked’
c.	/wù-à-pwiit-ang-a/	w-à-pwìit-ang	‘I pulled’
	/wù-à-bacik-ang-a/	w-à-bàcìk-ang	‘I pushed’
	/wù-à-jikitiš-ang-a/	w-à-jìkìtìš-ang	‘I thanked’

This is a very frequent morphologically-conditioned rule in Bantu, except that it is usually a H tone that is shifted to the right in this way (cf. Goldsmith 1984b).

Another frequent process in Bantu is Meeussen’s Rule, which we have seen in a number of examples above. Significantly, MR deletes a L after a L in Ruwund, and not a H after H. This is seen in a comparison of the citation vs. predicative forms in (25).

(25) Meeussen’s Rule in the predicative construction: L-L L-Ø

a.	mu-j	û-t	n-zal	mu-kìl	n-sûc	ci-kùmbu	ka-limish
b.	mǔ-j	ù-t-a	ṅ-zal	mù-kil-a	ṅ-sûc	cì-kumbw-a	kà-limish
c.	mu-kil-a	‘it’s a tail’		ka-limish	‘it’s respect’		
	↓ ↓			↓ ↓			
	L L			L L			
	∅			∅			

As seen in (25a), noun prefixes are normally toneless in Ruwund, where they will then receive a default H (vs. the default L in “etymological” Bantu tone systems). As seen in (25b), noun prefixes carry an underlying L in the predicative construction. As a result, an immediately following L will be deleted by MR, as shown in (25c).²⁰

The preceding thus shows that Ruwund generally has a marked L where other Bantu languages have a marked H. Crucially, this is not a case of where the unmarked H of other Bantu languages has been reinterpreted as a marked H in this language. In fact, I know of no example that takes this form: In Bantu, just as in Athapaskan (see Rice 1999 and references cited therein), the marked H or L tones of two languages in a close genetic relationship typically have a common etymology. In Athapaskan, this means that they go back to a common pre-tonal source involving laryngeal consonants (see Leer 1999 and references cited therein). As far back as Niger-Congo, our best guess is a reconstruction

²⁰In some cases a final -a is introduced on nouns as an additional mark of the predicative.

with two tones (cf. Mukarovsky's 1977 Proto-Western Nigrific). There have been two proposals for Proto-Bantu. The earliest proposals are for a reconstruction of *H and *L (Greenberg 1948, Meeussen 1967, Kähler-Meyer 1968). However, Stevick (1969:340), the author of the opening citation of this paper, proposed that "Ur-Bantu was a one-tone language" in the *H vs. *Ø sense. Either way, it is necessary to view the Ruwund situation as the result of tonal reversals (or inverted tones): historical (marked) *H becomes (marked) /L/. But how?

Nash (1992-1994) provides perhaps the most convincing scenario for such a development:²¹

(26) Diachronic scenario for tone inversion and reanalysis of /H, Ø/ to /L, Ø/

	'root'	'bow'	'hunger'	'tail'	hair'
a. Pre-Ruwund	mu-ji	u-tá	n-zala	mu-kíla	n-sucí
b. H-anticipation	mu-ji	ú-tá	n-zala	mú-kíla	n-súcí
c. H-H > H-HL	mu-ji	ú-tâ	n-zala	mú-kíla	n-súcî
d. HL > L	mu-ji	ú-tà	n-zala	mú-kíla	n-súcì
e. Ø = [M]	mū-jî	ú-tà	n̄-zālā	mú-kílā	n̄-súcì
f. V > Ø / __ #	mū-j	û-t	n̄-zāl	mú-kìl	n̄-sûc

In (26a), we start with the pre-Ruwund situation, where H is indicated by the acute accent and non-H is unmarked. Nash proposes that the first change that takes place is that the historical *H is anticipated onto the preceding TBU, as indicated in (26b). Then, the original H becomes a HL falling tone in (26c), as must have happened in languages such as Nande, which, as seen in (17), have anticipation of /H/ onto the preceding syllable. At this point, *Ø-H is now realized H-HL, which then becomes H-L (as in Nande) in (26d) by contour simplification.

If Ruwund had stopped here, it would be quite similar to Nande: H tones would be realized on the preceding TBU, their original starting place being marked L. It is here, however, that Nash proposes a quite interesting divergence: Rather than receiving default L, toneless moras are realized as a phonetic M(id) tone, i.e. as somewhat higher in pitch than L (< *H). In other words, Ruwund speakers would have identified the endpoint of a HL contour as lower than earlier non-H tone.²² The consequence of this default M is quite interesting: [M] is now in complementary distribution with [H], which can only appear before [L]. The two tones, M and H, thus become positional variants of the same (non-L) default tone. The last change in (26f) is the deletion process which affects most word-final vowels.

4. Conclusion

In the preceding sections we have contrasted two kinds of two-level tone systems in which a marked /T/ is contrasted with its absence: The first, more common, concerned languages where /H/ is marked, and non-H is unmarked. The second concerned languages where /L/ is marked and non-L is default. It thus should be clear that both

²¹ See also van Spaandonck (1971) and Maddieson (1976) for proposals on how inverted tones might have arisen in Luba, another Bantu language in the same general area, as well as Kaji (1996) for an interesting account of tone reversal in Tembo, also involving tonal anticipation.

²² Compare in this context the development of a downstepped L from an earlier HL fall in Nandi (Creider 1982, Hyman 1984).

possibilities are available—and can differ in just such a way in closely related languages. At this point I would like to briefly consider two additional questions concerning these findings: First, are there any differences between a H-marked vs. L-marked tone system? And, second, how do these findings relate to markedness of non-tonal features?

Concerning the first question, I have shown that the criteria used to establish markedness values are identical in H-marked and L-marked languages. In both systems a single marked tone is present in underlying representations. In most of the languages surveyed, the unmarked or default tone may remain absent in the lexical (word-level) phonology and even well into the postlexical phonology. This parallelism between marked /H/ and marked /L/ may give the impression that there can be no difference between such systems—i.e. that a marked /L/ can do anything that a marked /H/ can do (and vice-versa).

While almost true, there still are potential differences that depend on whether we are dealing with the presence of /H/ or of /L/. These differences specifically arise, as we might expect, when a distribution or process is phonetically grounded with respect to high vs. low pitch. For example, we have said that Bantu languages show an avoidance of H tone on a vowel that is adjacent to pause. Thus, quite regularly, the H of an utterance-final vowel is anticipated onto the preceding, penultimate syllable, and the H of an utterance-initial vowel is lost entirely (cf. the Haya examples in (6) above). Since these are common processes, I assume that these edge-adjacent erosions are phonetically grounded, hence so-called natural rules. However, it would be quite unusual for a language to prohibit marked /L/ on a pause-adjacent vowel. Unlike the phonetically natural processes we considered in Ruwund, e.g. spreading of /L/, deletion of a L on an utterance-initial or -final vowel, if attested, would be synchronically unmotivated from a phonetic point of view.²³ If occurring at all, it would presumably be the result of a Ruwund-style tone-reversal process: The original change would have been to avoid pause-adjacent H, which then becomes avoidance of pause-adjacent L by the processes that produce inverted tones. We unfortunately don't have very many inverted tone languages in Bantu to test this prediction. Suffice it to say that we expect avoidance of pause-adjacent marked-L to be rarer than avoidance of pause-adjacent marked-H.

A second possible asymmetry between H-marked and L-marked systems concerns H-tone plateauing. We have said that unmarked TBU's may become H between marked H's. However, whereas either a H or a L can spread, shift, delete etc., I know of no case where a sequence of H's has been argued to become L between L's. This too is logically possible in an inverted tone system, but the intuition is that the introduction of a process of L-tone plateauing would be less likely after the development of the L-marked system.²⁴

In addition to possible phonological differences, we might also ask whether the H and L tones are PHONETICALLY identical across H- vs. L-marked systems. That is, do they occupy the same tonal space? What is surprising about Ruwund is how low default H is in Ruwund (Jay Nash, personal communication). We have seen that it is considered M except before a L tone. From a synchronic point of view we can consider the difference between M vs. H (/__ L) to be the result of the natural tendency of a H to be raised before a L tone. Whether Nash's scenario is correct remains to be validated, perhaps by study of the other languages and dialects in the area.

²³ Whether it is motivated by some other principle, such as “avoid marked features at edges”, is beside the point, since the question I am raising in this section is whether there can be any differences in content between H-marked vs. L-marked tone systems.

²⁴ In fact, I would be less surprised to find loss of the L in a H-L-H sequence + plateauing, than loss of a H in a L-H-L sequence + plateauing, whether only /L/ is present, or both features are.

As a final point, it should be noted that it may not be clear in some languages whether the marked tone is H or L (cf. Leer’s contribution at the workshop). Some discretion may even be left to the analyst. A good case of this concerns the interpretation of the Tonga tone system. As pointed out by Meeussen (1963), and ignoring certain complications, the basic generalization is that TBU’s that occur BETWEEN historical H tones are H, and all other TBU’s are L. A historically (and synchronically) toneless verb form such as *tu-la-lang-a* ‘they look at’ will be realized with default L’s—but so will a corresponding verb form such as *tu-la-bon-a* ‘they see’, where there is only one historical (and synchronic marked) tone on the verb root *-bón-* ‘see’. Now consider the verb form in (27).

- (27) [*bà-lá-mú-bòn-à*] ‘they see him’
 they-pres-him-see
- a. *b̄a-la-mu-b̄on-a* (Meeussen 1963, based on Carter 1962)
- b. *b̄a^{*}-la-mu-b̄on^{*}-a* (Goldsmith 1984a)
- c. *ba-la-mu-bon-a* (Pulleyblank 1986)
 H H
- d. *b̄a^{*}-la-mu-b̄on^{*}-a* (Rialland 1988)
 H H
- e. *ba-la-mu-bon-a* (my proposal)
 L L

As seen in (27a), Meeussen analyzes Tonga in terms of (underlined) “determinant” vs. unmarked “neutral” vowels, which Goldsmith (1984) also adopts via his asterisk notation in (27b). As seen, the sequence *-lá-mú-* is pronounced H, since those vowels occur between determinant (or tonic) vowels. Pulleyblank (1986) reinterprets the Tonga system in purely tonal terms: Instead of underlying marks of tonicity (or “accents”), he starts with prelinked H tones, as indicated in (27c). A H tone will spread right-to-left up to a preceding H, and then the right-most link of each H will delink, thereby yielding the observed surface pattern. Rialland (1988) adopts a hybrid analysis in (27d), where the tonic vowels are marked both accentually and tonally. My own proposal in (27e) is that Tonga is a marked-L language. The main rule needed in this analysis is an insertion of H between any two L’s—which could be interpreted as an OCP effect. This would be followed by assigning default L to all remaining toneless TBU’s. There is no need for tone spreading or delinking in this analysis.²⁵

The second question I’d like to raise—and end with—concerns the relation of tonal markedness to non-tonal features. Is tone different from other features with respect to markedness possibilities? At first I felt it might be, since we do not, for example, consider nasality to be marked in one language, but orality in another. If H vs. L is different from Nasal vs. Oral, perhaps this is because of the gradient nature of tone? This has caused researchers such as Yip (1980) and Pulleyblank (1986) to propose two independent features, in which case H would be [+upper] and L would be [-raised]. In this case we could consider [+upper] to be marked with respect to [-upper], and [-raised] to be marked with respect to [+raised].²⁶ The possibility of a L-marked system would then be distinguished from the impossibility of an oral-marked system by the fact that there is only one marked feature value Nasal, and no corresponding marked feature Oral (cf.

²⁵Note that a form such as /*tu-la-bòn-a*/ ‘they see’ is realized all L, since there is only one underlying L tone. In a H-marked analysis, it would have to be delinked/deleted.

²⁶Equivalently, one could identify the latter feature as [lowered], in which case the marked value would be [+lowered].

Steriade 1995:149). In other words, tone height may be different because it really involves two (privative?) features, as in (28).

(28) Tone height may involve two privative features

- a. H/Ø = presence vs. absence of pitch-raising
- b. L/Ø = presence vs. absence of pitch-lowering

Even if correct, a distinction does not, however, seem to be the crucial factor. This is because the alleged difference between tone and (certain) segmental features may be overstated. Perhaps some of these latter do, in fact, tolerate two markedness possibilities. It does seem that certain features such as Nasal and Round have only one privative possibility (Steriade 1995:148-9). Like tone, vowel height is often analyzed with two height features, e.g. Open and Close. The three-vowel system /i, u, a/ is subject to a number of interpretations, since the privative features can be Round and Low, or Front and Low, or even Front and Round. What about a vertical system such as /i, a/, e.g. Miya (Schuh 1998)?²⁷ Could one language with this system have marked Open, while another has Close?

The possibilities, some of which are analyzed by Rice (in press), are quite extensive and do seem to suggest multiple possibilities along the same parameters. It thus seems that tone is not different from at least some segmental features. Have seen these similarities, the goal now can be to determine what constraints may be on either tonal or segmental markedness—and why.²⁸

References

- Akinlabi, Akinbiyi M. 1984. *Tonal underspecification and Yoruba tone*. Ph.D. dissertation, University of Ibadan.
- Anderson, Stephen C. 1979. Part II: Verb Structure. In Larry M. Hyman (ed.), *Aghem Grammatical Structure* (Southern California Occasional Papers in Linguistics 7), 73-136. Los Angeles: University of Southern California.
- Bao, Zhiming. 1999. *The structure of tone*. New York: Oxford University Press.
- Carter, Hazel. 1962. Notes on the tonal system of Northern Rhodesian Plateau Tonga. Colonial Research Study No. 35. London: Her Majesty's Stationery Office.
- Clements, G.N. 1984. Principles of tone association in Kikuyu. In G.N. Clements & John Goldsmith (eds), *Autosegmental studies in Bantu tone*, 281-339. Dordrecht: Foris.
- Clements, G. N. & John Goldsmith. 1984. Introduction. In G. N. Clements and J. Goldsmith (eds.), *Autosegmental studies in Bantu tone*, 1-18. Dordrecht: Foris.
- Coupez, A. 1954. *Etudes sur la langue Luba*. Tervuren: Musée Royal de l'Afrique Centrale.
- Creider, Chet A. 1982. *Studies in Kalenjin nominal tonology*. Berlin: Reimer.
- Creissels, Denis & Claire Grégoire. 1993. La notion de ton marqué dans l'analyse d'une opposition tonal binaire: Le cas du mandingue. *Journal of African Languages & Linguistics* 14.107-154.
- Goldsmith, John. 1976. *Autosegmental tonology*. Ph.D. Dissertation, M.I.T.
- Goldsmith, John. 1984a. Tone and accent in Tonga. In G. N. Clements and J. Goldsmith (eds.), *Autosegmental studies in Bantu tone*, 19-51. Dordrecht: Foris.

²⁷ Similarly, the five vowel system /i, e, u, o, a/ and its vertical analogue, /i, ə, a/, e.g. Kabardian, pose the same possibilities as languages with H, M and L tone heights.

²⁸ For example, could M be the marked tone in a three-height tone system? Could H or L be the unmarked tone, and so forth.

- Goldsmith, John. 1984b. Bantu -a-: The Far Past in the Far Past. In Russell G. Schuh (ed.), *Précis from the Annual Conference on African Linguistics*, 123-127. *Studies in African Linguistics*, Supplement 9.
- Goldsmith, John and Firmard Sabimana. 1986. The Kirundi Verb. In Francis Jouannet (ed.), *Modèles en tonologie*, 19-62. Paris: Editions du CNRS.
- Greenberg, Joseph H. 1948. The tonal system of proto-Bantu. *Word* 4.196-208.
- Hyman, Larry M. 1978. Tone and/or accent. In D.J. Napoli (ed.), *Elements of tone, stress and intonation*. Washington: Georgetown University Press. 1-20.
- Hyman, Larry M. 1982. Globality and the accentual analysis of Luganda tone". *Journal of Linguistic Research* 4.1-40.
- Hyman, Larry M. 1984. Book notice of Creider (1982). *Language* 60.674-675.
- Hyman, Larry M. 1987. Downstep deletion in Aghem. In David Odden (ed.), *Current approaches to African linguistics* (vol. 4), 209-222. Dordrecht: Foris Publications.
- Hyman, Larry M. 1989. Accent in Bantu: an appraisal. *Studies in the Linguistic Sciences* 19.115-134.
- Hyman, Larry M. 1990. Boundary tonology and the prosodic hierarchy. In Sharon Inkelas & Draga Zec (eds), *The phonology-syntax connection*, 109-125. Chicago: University of Chicago Press.
- Hyman, Larry M. 1999. The interaction between focus and tone in Bantu. In Georges Rebuschi & Laurie Tuller (eds), *The grammar of focus*, 151-177. Amsterdam: John Benjamins.
- Hyman, Larry M. In press. Tone systems. In Martin Haspelmath, Ekkehard König, Wulf Oesterreicher, & Wolfgang Raible (eds), *Language typology and language universals: An international Handbook*. 2 vols. Berlin & New York: Walter de Gruyter.
- Hyman, Larry M. & Ernest Rugwa Byarushengo. 1984. A model of Haya tonology. In G. N. Clements & John Goldsmith (eds), *Autosegmental studies in Bantu tone*, 53-103. Dordrecht: Foris Publications.
- Hyman, Larry M. & Francis Katamba. 1993. A new approach to tone in Luganda. *Language* 69.34-67.
- Hyman, Larry M. & Nzama Valinande. 1985. Globality in the Kinande tone system. In D. Goyvaerts (ed.), *African Linguistics*, 239-260. Amsterdam: Benjamins.
- Kähler-Meyer, E. 1968. The tones in Urbantu. *Afrika und Übersee* 51.81-90.
- Kaji, Shigeki. Tone reversal in Tembo (Bantu J.57). *Journal of African Languages & Linguistics* 17.1-26.
- Kimenyi, Alexandre. 1988. A tonal grammar of Kinyarwanda. Ms.
- Kisseberth, Charles W. 1984. Digo tonology. In G. N. Clements & John Goldsmith (eds), *Autosegmental studies in Bantu tone*, 105-182. Dordrecht: Foris Publications.
- Leer, Jeff. 1999. Tonogenesis in Athapaskan. In Shegeki Kaji (ed.), *Cross-linguistic studies of tonal phenomena: Tonogenesis, typology, and related topics*, 37-66. Tokyo: ILCAA.
- Mutaka, Ngessimo M. 1994. *The lexical tonology of Kinande*. Munchen: Lincom Europa.
- Maddieson, Ian. 1976. Tone reversal in Ciluba: a new theory. In Larry M. Hyman (ed.), *Studies in Bantu tonology* (SCOPIL #3), 141-165. Los Angeles: University of Southern California.
- Maddieson, Ian. 1978. Universals of tone. In Joseph H. Greenberg (ed.), *Universals of human language*, vol. 2 (Phonology), 335-365. Stanford University Press.
- May, Jean & Eunice Loeweke. 1964. The phonological hierarchy in fasu. *Anthropological Linguistics* 7.5:89-97.
- McCawley, James D. 1968. *The phonological component of a grammar of Japanese*. The Hague: Mouton.
- McCawley, James D. 1970. Some tonal systems that come close to being pitch accent, but don't quite make it. *Chicago Linguistic Society* 6.526-532.
- Meeussen, A. E. 1963. Morphotonology of the Tonga verb. *Journal of African Languages* 2.72-92.
- Meeussen, A.E. 1967. Bantu grammatical reconstructions. *Annales du Musée Royal de l'Afrique Centrale, Série 8, Sciences Humaines*, 61.81-121. Tervuren.

- Mukarovsky, H. 1977. *A study of Western Nigritic*, vol. 1. Wien: Beiträge zur Afrikanistik. Institut für Ägyptologie und Afrikanistik der Universität Wien.
- Myers, Scott. 1998. Surface underspecification of tone in Chichewa. *Phonology* 15.367-392.
- Nash, Jay A. 1991. *Ruwund vocabularies*. Urbana-Champaign : Center for African Studies, University of Illinois at Urbana-Champaign.
- Nash, Jay A. 1992. *Aspects of Ruwund grammar*. Unpublished PhD dissertation, University of Illinois.
- Nash, Jay A. 1992-94. Underlying low tones in Ruwund. *Studies in African Linguistics* 23.223-278.
- Odden, David. 1988. Predictable tone systems in Bantu. In Harry van der Hulst and Norval Smith (eds), *Autosegmental studies on pitch accent*, 225-251. Dordrecht: Foris.
- Odden, David. 1999. Typological issues in tone and stress in Bantu. In Shegeki Kaji (ed.), *Cross-linguistic studies of tonal phenomena: Tonogenesis, typology, and related topics*, 187-215. Tokyo: ILCAA.
- Pulleyblank, Douglas. 1986. *Tone in lexical phonology*. Dordrecht: Reidel.
- Rialland, Annie. 1988. *Systèmes prosodiques africains*. Thèse du Doctorat d'Etat.
- Rice, Keren. 1999. How phonetic is phonology? Evidence from tones in Athapaskan languages. Paper presented at the Conference on Distinctive Feature Theory, ZAS Berlin, October 1999.
- Rice, Keren. In press. Featural markedness. *GLoT*.
- Rivierre, Jean-Claude. 1978. Accents, tons et inversion tonale en Nouvelle Calédonie. *Bulletin de la Société de Linguistique de Paris* 73.415-443.
- Schuh, Russell G. 1998. *A grammar of Miya* (UCPL 130). Berkeley: University of California Press.
- Snider, Keith L. 1999. *The geometry and features of tone*. Dallas: Summer Institute of Linguistics. Arlington : University of Texas at Arlington.
- Steriade, Donca. 1995. Underspecification and markedness. In John Goldsmith (ed.), *The handbook of phonological theory*, 114-174. Cambridge, MA: Basil Blackwell Ltd.
- Stevick, Earl W. 1969a. Tone in Bantu. *International Journal of American Linguistics* 35.330-341.
- Stevick, Earl W. 1969b. Pitch and duration in Ganda. *Journal of African Languages* 8.1-28.
- Thomas, Elaine. 1974. Engenni. In John Bendor-Samuel (ed.), *Ten Nigerian tone systems. Studies in Nigerian Languages*, vol. 4, 13-26. Summer Institute of Linguistics.
- Thomas, Elaine. 1978. *A grammatical description of the Engenni language*. University of Texas at Arlington: Summer Institute of Linguistics.
- van Spaandonck, Marcel. 1971. On the so-called reversive tonal system of Chiluba. *Studies in African Linguistics* 2.131-144.
- Welmers, Wm E. 1959. Tonemics, morphotonemics, and tonal morphemes. *General Linguistics* 4.1-9.
- Yip, Moira. 1980. *The tonal phonology of Chinese*. PhD dissertation, MIT.

APPENDIX

A PROTOTYPE APPROACH TO TONE/ACCENT SYSTEMS

BASIC INSIGHT (cf. McCawley 1968, 1970):

Tone is like segmental features; stress is unlike segmental features

Reinterpretation (Hyman 1989, in press)

tone = pitch features present lexically (e.g. at word level)

cf. “a tone language is a language in which both pitch phonemes and segmental phonemes enter into the composition of at least some morphemes” (Welmers 1959)²⁹

stress = metrical structure present lexically (e.g. at word level)

cf. word-stress vs. sentence-stress vs. focus vs. intonation

CLAIMS:

- 1) There are well-defined prototypes of tone- and stress systems, in which properties cluster as in the left- and right columns below.
- 2) There is no third type, i.e. no cluster of properties that defines all such languages as “pitch-accent” or “tonal-accent”
- 3) So-called pitch-accent languages simply diverge from the two clear prototypes (tone and stress) by picking and choosing different properties from each column
- 4) Pitch-accent systems are thus different from each other, e.g. Tokyo Japanese Swedish Serbo-Croatian Bantu /H, Ø/ etc.

TONE:

STRESS:

(1) PROTOTYPICAL DISTRIBUTION

FREE

Possibility of multiple tones
Possibility of zero (toneless words)
OCP, other distributional constraints
= non-essential

CULMINATIVE

Impossibility of multiple stresses
Impossibility of zero (no stressless Ws)
CLASH/GRID = essential

(2) PROTOTYPICAL LEXICAL DOMAIN

THE MORPHEME

THE WORD

(3) PROTOTYPICAL FUNCTION

DISTINCTIVE (“paradigmatic”)

DEMARCATIVE (“syntagmatic”) (> Contrastive)

²⁹In Hyman (in press) I propose slightly amending Welmers’ definition to read: “A language with tone is one in which an indication of pitch enters into the lexical realization of at least some morphemes.” This is in response to the fact that the same language may be analyzed with lexical tone by one research, but with “accent” by another. Thus, whether Tokyo Japanese is analyzed with a prelinked H tone or without a diacritic accent should not affect its typology: If diacritic accents have the sole purpose of indicating tone, then this is a tone system by my definition—and however restricted the so-called accents (tones) may be.

(4) PROTOTYPICAL REALISATION

PITCH

(other things prototypical)
[intrinsic distinctive feature's]
TBU = vowel, mora (syllable?)

COMPLEX

(pitch, duration, intensity)
[no intrinsic DF's < intonation]
SBU = syllable

(5) PROTOTYPICAL EFFECT OF TONE/STRESS ON PHONOLOGY

SELF-CONTAINED

Tones affect tones
(T's do not generally affect C's, V's)

GLOBAL EFFECT

Stress affects all phonology
(C's, V's are affected by stress:
strengthening/weakening;
gemination; diphthongization etc.)

(6) PROTOTYPICAL EFFECT OF PHONOLOGY ON TONE/STRESS

CONSONANT TYPES AND TONE

T's are affected by C's, not so
much by V's

SYLLABLE WEIGHT

Stress is affected by heavy vs. light
syllables, not by specific segments.

(7) PROTOTYPICAL INTERACTION WITH GRAMMAR

*INDEPENDENT REALIZATION
INTONATION*

Syntactic/semantic side of tones
mediated through the tones of
morphemes; otherwise prototypical

INTEGRATED WITH FOCUS &

Word-stress used to realize syntactic
accent for focus purposes, in turn used
to line up intonational melodies

(8) PROTOTYPICAL RULE TYPES

*SAME AS SEGMENTAL RULES
RULES*

E.g. Assimilation, dissimilation

DIFFERENT FROM SEGMENTAL

E.g. Reduction, retraction etc.