THE TWO-DIRECTIONAL TONE MELODY SPREAD IN SUKUMA

H. M. Batibo
University of Dar es salaam

1. INTRODUCTION

1.1 Earlier Studies on Sukuma Tone

The tone structure of Sukuma, a language spoken by over 4 million people in north-west Tanzania and classified as F21 in Guthrie's classification of Bantu languages, was first described by Richardson (1959), followed later by Batibo (1976, 1977/85). Both studies made insightful descriptions of the tone displacement phenomenon characteristic of this language. Recent studies by Goldsmith (1985) and Philippson (forthcoming) have attempted to refine the earlier studies by using autosegmental approaches as described in Goldsmith (1982) and Clements and Goldsmith (1984).

In this paper, I will highlight the tone rules which underlay the nominals, that is the words, and especially lexical morphemes, that belong to the [+N] category. I will demonstrate that the synchronic Sukuma tone system consists of two sets of opposite LH melody spread rules which interact in order to produce the surface tone realization. The major argument in this paper is that the two sets of rules conspire to ensure that no more than one H is realized on each morpheme.

1.2 The Tone Patterns of Sukuma Nominals

Traditionally, Sukuma nominals have been tonally distinguished between the toned or marked and the toneless or unmarked at the underlying level. The toned nominals have again been differentiated between those associated with a fixed H and those associated with a shifted H (Richardson, 1959; Batibo, 1977/85). The three types are exemplified in (1) below. These forms represent all the possible underlying and surface tone patterns before pause. In our convention, an acute accent (´) will be used to indicate a fixed H; a multiplication sign (ˣ) will represent a shifted H; and a grave accent (`) will represent an extra low tone realization. All H tones are realized with a falling pitch in word-final position when followed by pause.

(1) (a) Underlying Toneless (25% of all nominals)

/ø-sa/	[sa]	'watch, clock'
/i-we/	[iwe]	'stone'
/n-kolo/	[ŋholo]	'sheep'
/n-taale/	[nhaale]	'big one' (cl.9/10)
/ma-halage/	[mahalage]	'beans'
/βa-lɪmɪlɪji/	[βalɪmɪlɪji]	'paid farm workers'

(b) Shifted H (44% of all nominals)

/wɛ̃ˣ/	[wè]	'he,him'
/n-damãˣ/	[ndamà]	'calf'
/βa-dʊgʊ̃ˣ/	[βadʊgʊ̀]	'relative'
/βa-tɛ̃mi/	[βatèmì]	'chiefs'
/n-tʊ̃mbɪ̃lɪ/	[nhʊʊmbìlì]	'monkey'
/n-kʊ̃ngʊ̃lʊ̃me/	[ŋhuungulùmè]	'cock, rooster'

(c) Fixed H (34% of all nominals)

(i)	/ɪ-mó/	[ɪmô]	'one'
	/ø-talá/	[talâ]	'lamp'
	/m-βeelé/	[mbeelê]	'breasts'
	/i-taanó/	[itaanô]	'five'
	/kɪ-dalí/	[kɪdalî]	'sternum'
	/n-ʃilikalé/	[nʃilikalê]	'policeman, soldier'
	/ø-suluβalé/	[suluβalê]	'pair of trousers'
(ii)	/i-gópo/	[igópò]	'cup'
	/i-βalaβála/	[iβalaβálà]	'road'
	/ø-kasógone/	[kasógònè]	'gonorrhea'
	/ø-sákambulɪ/	[sákaambùlì]	'hiccup'
(iii)	/ma-dʊʊtʊ/	[madʊútù]	'leaves'
	/ø-βaángili/	[βaángìlì]	'bracelet'
	/ø-ameélika/	[ameélìkà]	'America'
(iv)	/ø-kúʊlɪ/	[kúʊlɪ]	'monitor lizard'
	/ø-tʉ́ʊnge/	[tʉ́ʊnge]	'bat'
	/i-páanga/	[ipáanga]	'matchet, bush knife'
	/βʊ-láaʃi/	[βʊláaʃi]	'brush'
	/ø-sogóoni/	[sogóoni]	'market place'

1.3 The H Shift phenomenon

Sukuma data is noted for what has been described as a H tone shift rule which displaces an H from its original TBU (tone bearing unit). The displaced H shifts from the original TBU to the third TBU on the right, if it is within the same word. If there remains less than two TBU's before the end of a word, then, unless constrained by another H in the environment, it will surface on the second TBU of the following word. These rules are shown in (2) below:

(2) a. k-βon-el-a ---> kʊβonela [kʊβonelâ] 'to see by means of'

H H

b. kʊ-βon-a ma-halage ---> kʊβona mahalage [kʊβona mahálage] 'to see some beans'

H H

c. n-dʊgʊ geete ---> ndʊgʊ geete [ndʊgʊ geetê] 'a true relative'

H H

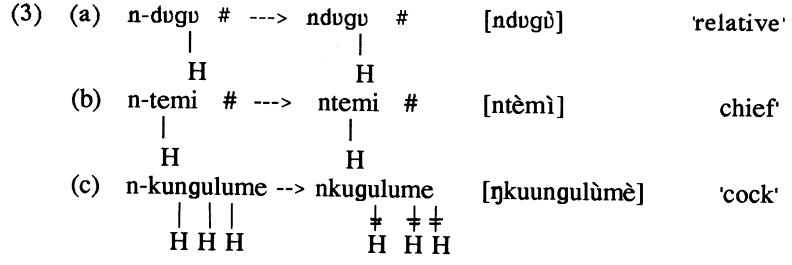
d. n-temi geete ---> ntemi geete [ntemi geetê] 'a real chief'

H H

It should be stated right at the outset that the TBU in Sukuma neither corresponds to the syllable nor to the mora. A long syllable in which the two moras are tonally identical is considered as one TBU; while a long syllable in which the two moras are not tonally identical (one may be potentially H as it is the case of extensions) is regarded as having two TBU's.

1.4 The EL (Extra Low) Realization:

If an H is shifted from a penultimate or final TBU before pause, the TBU concerned will be realized as EL, transcribed in this study with a grave accent. Whenever an L on a penultimate TBU has to be realized as EL, the L on the final TBU will also be realized likewise. At the moment, we shall consider the 'shifting' phenomenon as a delinking of H from its original syllable. This process is shown in (3) below:



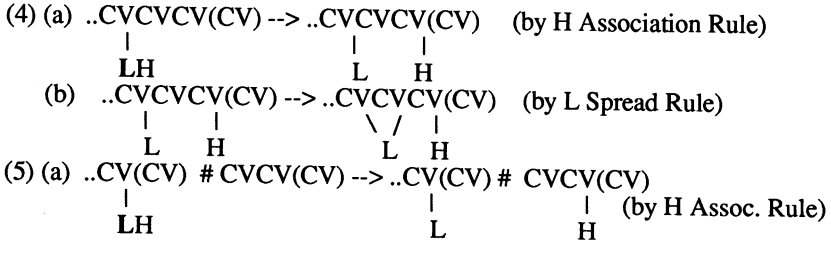
2. THE TWO-DIRECTIONAL TONE MELODY SPREAD RULES

2.1 The LH Spread Rules

In this study, I shall treat the H shift phenomenon as an LH melody spread. This is because H does not shift completely from its original TBU but rather extends in such a way that the H part surfaces on the third TBU while the L part remains to block any H from the left from associating with the original TBU. As will be demonstrated in this section, the LH melody spreads both ways, where the L part is fixed, the H part will extend rightward, and where the H part is fixed, the L part will extend leftwards. In order to distinguish between the two types of spreading, we shall mark the rightward melody as LH and the leftward melody as **LH** (the bold letter will indicate the fixed part).

2.2 The **LH** Melody Spread Rules:

The **LH** spread phenomenon, illustrated in (2) above, could be captured by the rules shown in (4) below.



(b) ..CV(CV) # CVCV(CV) --> CV(CV) # CVCV(CV)
L H L H (by L Spread Rule)

According to the rules in (4) above, the H of **LH** contour associates with the third TBU on the right, and then the L part associates with the second TBU. Where there are not enough TBU's on the same word then Rule (5) operates. In this case the H of **LH** will associate with the second TBU of the following word. Then the L part will associate with the remaining TBU's on the right. However, there are other tone characteristics which cannot be handled by the rules in (4) and (5), as shown in (6) below:

(6)
ø-sakambʊlɪ geete --> sakambʊlɪ geete [sákaambʊlɪ geetê] 'a true hiccup'
LH H **L** H

What happens in (6) can be explained by the rules in (7). The cross sign (+) represents a morpheme boundary.

(7) (a) +CVCVCVCV+ # CVCV --> +CVCVCVCV+ # CVCV
LH **LH** **LH** (**LH** Derivation Rule)
(b) +CVCVCVCV+ # CVCV --> +CVCVCVCV+ # CVCV
H **LH** H L H (H Assoc.)
(c) +CVCVCVCV+ # CVCV --> +CVCVCVCV+ # CVCV (L Spread)
H L H H L H

As shown in Rule (7a), an **LH** melody derives or triggers an **LH** melody on the following TBU, if the latter is within the same morpheme. On the other hand, Rule (7b) indicates that the H of **LH** contour does not associate with the third TBU on the right, instead it crosses into the next word and links to the second TBU. One important motivation of rule (7) is to prevent the occurrence of two H's on the same morpheme. The example from one of the newly acquired multisyllabic loanwords presented in (8) will serve as further evidence.

(8) (a) ø-telegilaamu ɪyɪ --> telegilaamu ɪyɪ (Rule 7a) 'this telegram'
LH **LH** **LH**
(b) telegilaamu ɪyɪ --> telegilaamu ɪyɪ (Rule 7b)
LHLH LH L H
(c) telegilaamu ɪyɪ --> telegilaamu ɪyɪ (Rule 7c)
H L H H L H

2.3 The LH Melody Spread Rules:

The H association restriction described in (7a) above also takes place, in somewhat different ways, leftwards. In this case, the L part of LH stretches leftwards to associate with the first TBU of the respective morpheme. The basic rules of the LH melody are shown in (9) below:

(9) (a) +CVCVCVCV(V)(CV)+ --> +CVCVCVCV(V)(CV)+ (L Assoc. Rule)
LH L H

(b) +CVCVCVCV(V)(CV)+ --> +CVCVCVCV(V)(CV)+ (L Spread Rule)
L H L H

One important effect of Rule (9) is that no H from an LH of a previous morpheme can associate with the morpheme already linked by L, as exemplified in (10) and (11) below:

(10) (a) ku-βon-a ø-suluβale --> kuβona suluβale 'to see a pair of trousers"
LH LH LH L H

Rule (9)

(b) kuβona suluβale --> kuβona suluβale [kuβoná suluβalê]
LH L H L H L H

(11) (a) ku-βon-a i-βalaβala --> kuβona i-βalaβala 'to see a road'
LH LH LH L H LH Rule (7a) and (9)

(b) kuβona i-βalaβala --> kuβona i-βalaβala [kuβoniíβalaβálà]
LH L H LH L H L H LH

However, the leftward spread of the L of an LH melody is subjected to many specific conditions, all connected with the position of the TBU in the morpheme to which the LH is initially linked. Consider, for example, the cases in (12) below:

(12)(a) ku-βon-a kɪ-dali-->kuβona kɪdali [kuβoná kɪdalî]'to see a sternum'
LH LH L H L H *[kuβona kídalî]

(b) ku-βon-a ma-gunɪla -->kuβona magunɪla [kuβona mágunílà] 'to see sacks'
LH LH L H LH LH *[kuβoná magunílà]

(c) ku-βon-a ma-goodi -->kuβona ma-goodi [kuβona mágóodi] 'to see shirts'
LH LH L HLH Also [kuβoná magóodi]

(d) ku-βon-a ma-duʊtu --> kuβona madʊʊtu [kuβona mádʊútù] 'to see leaves'
LH LH L H LH LH *[kuβoná madʊútù]

The somewhat peculiar conditions found in (12a), (12b), (12c) and (12d) above can, in fact, be summarized by Rules (13a) and (13b) below:

(13) (a) #..CV+CVCV+ --> #..CV+CVCV+

| \ / |

LH L H

(b) # ..CV+CV(C)VCV(CV) --> #..CV+CV(C)VCV(CV)

| | |

LH L H

Thus, across morpheme boundary, the L of **LH** associates with two TBU's if the H component is in morpheme-final position, but with only one TBU if the former is in a position other than final. Rule (14) below shows that there is an option for the L of **LH** to be deleted if the H is in morpheme-initial position on the first mora of a long syllable. This then permits an H from a preceding **LH** contour to link with the TBU immediately preceding the TBU associated with the H.

(14) +CVVCV --> + CVVCV (L Deletion Rule)

| |

LH LH

3. FURTHER OBSERVATIONS:

The incidence of the two-directional tone melody spread and the many specific rules attached to each type give rise to a number of theoretical and historical issues connected with the Sukuma data. Some of the important ones are discussed below.

3.1 The Essence of the two-directional Spread:

At the lexical level, Sukuma nominals could be described as belonging to one of the three types shown in (15) below.

(15) (a) CVCVCV (b) CVCVCV (c) CVCVCV

LH(LH) **LH**

Category (15a) represents the toneless nominals, that is those nominal morphemes which are not associated with any tone melody at the underlying level. They become associated with a default L at the surface level. Categories (15b) and (15c) represent marked nominals, that is, nominals in which at least one of their TBU's is associated with either **LH** or **LH**. While more than one **LH** contours may associate with a given morpheme, only one **LH** can be associated with a morpheme. As we saw above, the rules of **LH** will always have precedence over those of **LH**, as the former operate normally within the boundaries of a morpheme, while the latter nearly always transcend such boundaries.

Clearly the two tone spread types have a lot in common in that apart from the fact that they both conspire to disallow the surfacing of more than one H in the same morpheme, they ensure that any H in an adjacent syllable surfaces at least one L (one TBU) away from a prevailing H. In fact, the **LH** Derivation Rule presented

in (7a) above could have originated from the same condition of restricting the occurrence of another H on the right. The one L condition for the H is presented in rule (16) below.

(16)
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CVCVCV
 |  |  |
 H  L  H
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The general condition demonstrated in (16) gives rise to a well-graded LHLHLH pattern which tends to be realized with a downdrift in Sukuma. On the other hand, as we saw in (12c) above, the succession of two H's is acceptable across morpheme boundary if the second H is linked to the first mora of a long syllable.

Other cases in which more than one H is associated with one morpheme are found in former compounds whose constituent stems are no longer separable. Some of these compounds are exemplified in (17) below:

(17)	/ø-βaláβaapú/	'butterfly'
	/ø-kɪtwangaβúleénde/	'camel'
	/ø-kɪdʊʊndúfiilú/	'kind of insect with big stomach'
	/ø-kasungúseelyá/	'praying mantis'

Another case where two H's can coexist on the same morpheme is where intonational surface rules bring two H's on a given morpheme. This is exemplified in (18) below:

(18)		yo súluβalê!	'That is truly a pair of trousers!'
		yo súluβále?	'Is that a pair of trousers?'
	But:	yó suluβalê.	'That is a pair of trousers.'

Also, an H may surface on a morpheme already associated with H if the former is restricted from crossing into another morpheme. This is exemplified in (19) below.

(19)	sákaambulí gàʃì	'It is a really hiccup'
	télegilaamú fà	'It is indeed a telegram'

3.2 The Interplay Between Tonology and Morphology

One important feature about the specific rules described above is that they are, to a large extent, dependent on the position of the TBU in the morpheme or syllable. The position may be morpheme-final vs. non-final, or first vs. second mora of a syllable. This morphological and syllabic dependency tends to go against the classical tone rule association conventions in which segments and tones are expected to link on a one-to-one basis without any reference to morphological or syntactic information.

Another related fact is that, in multisyllabic Sukuma loans, the LH has invariably associated with the first mora in a long penultimate syllable, but with the second mora in a long antepenultimate syllable. This is exemplified in (20) below. The stress in this case was interpreted as a high tone in penultimate or final syllable.

(20)	/ø-filíimbi/	'flute'	(Sw. fi'liimbi)[4]
	/ø-βasikéeli/	'bicycle'	(Sw. basi'keeli)
	/ma-dafáali/	'bricks'	(Sw. mato'faali)
	/ø-sanáamu/	'statue, picture'	(Sw. sa'naamu)
	/ø-deléeva/	'driver'	(Sw. de'reeva)
	/ø-kaláamu/	'pen, pencil'	(Sw. ka'laamu)
	/ø-lúula/	'ruler'	
	/βʊ-áya/	'wire'	
	/ø-giláasi	'glass'	
	/βʊ-swíizi/	'Switzerland'	
	/ø-βúuʃi/	'Bush'	

But:

/ø-ameélika/	'America'	
/ø-loóndoni/	'London'	
/β-hoolaandi/	'Holland'	
/ø-meételo/	'metro'	
/ø-leédiyo/	'radio'	
/ø-moódoka/	'car'	(Sw. moto'kaa)
/ø-paádili/	'priest'	
/ø-paásita/	'pastor'	
/ø-leégaani/	'Reagan'	

3.3 The Complex Historical Development of Sukuma

As a general rule, most of the nominals associated with the **LH** contour belong to the old stock of Sukuma vocabulary, and those associated with the **LH** belong to latter adoptions. The former comprises more than 44% and the latter about 34% of the nominals in the language. In some cases, the same Proto-Bantu term may appear in Sukuma under two reflexes, one representing the old or authentic form and the other an adoption from another Bantu (Swahili or neighbouring) language. A few such examples are demonstrated in (25) below.

(21)	Authentic		Recent Adoption	
	/n-cũ̃βa/	'beer calabash'	/ø-cupá/	'bottle'
	/ø-ʃ̃íkʊ/	'days'	/lʊ-ʃíkʊ/	'day of 24 hours'
	/ø-sukũ̃ma/	'north'	/n-sukúma/	'a Sukuma speaker' (Northerner)
	/kʊfunga/	'to open'	/kʊfungʊlá/	'to close'
	/ø-dakã̃ma/	'south'	/n-dakáma/	'a Nyamwezi speaker' (Southerner)

Moreover, in the case of **LH**-associated vocabulary, the more recent stock is the one in which the **LH** is linked to the first mora of a long syllable as in (1c(ii)) above. Most of these terms are either Swahili or English loans, or terms which are not found in the other related languages in the area. This would suggest that the Sukuma people acquired them upon arrival on the southern shores of the lake which is now known as Lake Victoria. On the other hand, the stock in categories (1c(i),

(1c(iii)) and (1c(iv)) is, generally, the intermediate vocabulary. Moreover, other observations could be made in connection with the recent loans in Sukuma:

First, a number of nominals were borrowed as toneless lexical items. These terms cannot be distinguished from the authentic Sukuma stock. Examples of such nominals include /kɪ-taβo/ 'book' (from Arabic through Swahili) and /kɪ-tanda/ 'bed' (from Swahili).

Second, some authentic lexical items like /m-βeelé/ 'breast' and /i-taanó/ 'five' are associated with **LH** because the shifted H failed to cross the boundaries of the morpheme. Conversely, there are at least two new terms which are associated with **LH** contour. These are /n-sa la βa/ 'Cross' (from Arabic through Swahili) and /ø-muse̩e le/ 'bishop' (apparently from French). One possible explanation of these exceptions is that the two words were pronounced strangely by the French missionaries.

Third, there are recent adoptions such as /i-gópo/ 'cup' (from English through Swahili) and /i-βalaβála/ 'road' (from Swahili) in which the H (representing stress in the language of origin) has surfaced on a short, usually penultimate vowel.

Thus, Sukuma nomianls could be categorized according to how far H has shifted from the original syllable to cause an **LH** or **LH** melody. The process may have involved two (old stock) or one (intermediate stock) TBU shift, or no shift at all (recent stock). Examples of the three categories are presented in (22) below.

(22)	Original Association	New Association	
	(a) Old Stock		
	/i-táano/	/i-taanó/	'five'
	/m-βéele/	/m-βeelé/	'breast'
	(b) Intermediate Stock		
	/ø-tála/	/ø-talá/	'lamp'
	/ø-cúpa/	/ø-cupá/	'bottle'
	(c) Recent Stock		
	/i-gópo/	/i-gópo/	'cup'
	/i-βalaβála/	/i-βalaβála/	'road'
	/i-góodi/	/i-góodi/	'shirt'
	/ø-lúula/	/ø-lúula/	'ruler'

The categories shown above should be treated as a general impression of historical development, and should not be associated with any strict chronological events, as the H shift rule may have affected the vocabulary in different ways.

4. CONCLUSION

This paper was concerned with the description of the two tone melody spread types which characterize Sukuma nominals. It has been demonstrated that each type presents a number of conditions and restrictions, many of which are language-specific. Many of the rules are morphologically dependent, and some of them may not seem to conform to the standard autosegmental framework. This is clearly one feature which led Richardson (1959) to state that some of the rules in Sukuma were difficult to bring to systematization.

One of the Sukuma restrictions described by Goldsmith (1990:18) is that 'no High tone in Sukuma can be associated with more than one vowel'. This condition could, in fact, be generalized to present a restriction of the surfacing of any two H's on the same morpheme and the succession of two H's on adjacent TBU's. One effect of this restriction has been the creation of the **LH** Derivation Rule presented in (7a) above. This rule triggers an **LH** melody whose effect is to displace the H at least three syllables away from the preceding H.

The other related issues which have been highlighted in this paper include the realization of the **LH** contour before pause in final or penultimate positions. Also the tone pattern of loanwords was described. It was seen that one of the major reasons the Sukuma tone system is so complex is because of substantial inflow of foreign words that have entered at different periods and therefore caused different tone patterns.

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