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BADE/NGIZIM VOWELS AND SYLLABLE STRUCTURE*

Russell G. Schuh
University of California, Los Angeles

Among the vowels of Bade and Ngizim, the short high vowels play a functional role different from the other vowels. Although word final *i* and *u* are full-fledged phonemes (non-predictable and contrastive), both the position of occurrence and the quality of the phonetic high vowels [*i*, *e*, *u*] is predictable in medial position: the quality is determined by other segments in the environment; the position is determined by restrictions against certain groupings of consonants. Bade and Ngizim differ in one important respect in the placement of non-final short, high vowels, viz. through a change called PROTHESIS, original initial sequences of the type * $C_1\text{e}C_2$... (still realized as such in Ngizim) are now realized as $\text{e}C_1C_2$... in Bade if C_1C_2 is not an impermissible sequence. This is true for all words with no more than two consonants, though the situation is somewhat more complicated in longer words; tone of the initial syllable is also seen to play a role. The permissible sequences of consonants, and as a consequence the environment for PROTHESIS, are discussed in the light of universal hierarchies of consonantal strength and principles of syllabification in conjunction with a restriction in Bade/Ngizim against two consonants occurring at a syllable margin.

1. Introduction

1.1. The languages. Bade and Ngizim are two closely related languages of the West Chadic branch of the Chadic family spoken in northeastern Nigeria.¹

*Research on Ngizim was conducted mainly from 1969-70 in Potiskum, Nigeria under the auspices of NSF grant no. GS-2279 (Paul Newman, Principal Investigator). Research on Bade was conducted from 1973-75 in Gashua, Nigeria while I was employed as a Research Fellow in the Centre for the Study of Nigerian Languages, Bayero University College, Kano. My thanks to Paul Newman for useful comments on an earlier draft of this paper.

¹The most recent classification of Chadic languages [Newman 1977] divides the Chadic family into four major branches: West Chadic, spoken almost entirely in northeastern Nigeria; Biu-Mandara, spoken in northern Cameroon and adjacent areas of Nigeria and Chad; East Chadic, spoken in Western and central Chad; and Masa, spoken in Cameroon and Chad south of N'Djamena.

Ngizim is spoken in an area fanning out to the east from Potiskum. Bade is spoken north of Ngizim in an area from Gashua to the west and south. Bade and Ngizim are no longer in contact, but the migration of the Ngizims southward and the ultimate separation of the two language communities has taken place only in the last few hundred years.

Ngizim has virtually no dialect differentiation other than a few lexical differences among villages. Bade, on the other hand, has considerable differentiation at all linguistic levels (see Schuh [1977a] for many examples in the determiner system and associative noun phrases). The dialect used here is that of Gashua and adjacent villages. Although there are a number of phonological differences between this dialect and others, all dialects are virtually identical in the respects relevant to this study.

1.2. Scope of the present study. One of the main areas of interest in Bade and Ngizim phonology is the distribution of high vowels. In fact, high vowels in both languages function primarily as epenthetic vowels to break up impermissible consonant sequences. The paper begins with a summary of the vowel phonology of this group, concentrating on the distribution of high vowels.

Following this is a description of a phonological difference between Bade and Ngizim, which is discussed and illustrated in detail. Briefly stated, this difference is the following: under certain conditions, in an initial sequence $C \begin{bmatrix} V \\ +high \end{bmatrix} C$ Bade has dropped the vowel and added a prothetic high vowel to give a sequence $\begin{bmatrix} V \\ +high \end{bmatrix} CC$, whereas Ngizim has not done this, e.g. Ngizim *gùzép* 'slave' but Bade *ùgzéf* 'slave'.

Finally, certain universal principles of syllabification which have been proposed are cited as bearing on the distribution patterns of Bade and Ngizim high vowels.

2. Bade/Ngizim Vowels

2.1. Vowel nuclei. The simple vowel nuclei of Bade and Ngizim are given in (1):

(1)	i, ii	[ə]	u, uu
	ee		oo
	a, aa		

Doubled vowels represent long vowels; the symbol ə represents phonetic [ɨ] and hence is one of the set of high vowels.

The mid vowels are of secondary origin, having entered the languages through borrowing and monophthongization of diphthongs. Long aa and short a contrast in all environments, though long aa is extremely rare in word final position. Some minimal or near minimal pairs are given in (2):²

(2)	aa		a	
	Ngizim	Bade	Ngizim	Bade
	d̄aasú	d̄aasú 'pour'	d̄asú	d̄asú 'finish'
	gàadú	kàadú 'bite'	gàdú	kàdú 'break'
	àad̄au	àad̄au 'south'	àd̄án	àd̄án 'crying'

No high vowels can be reconstructed word initial for proto-Bade/ Ngizim,³ though in Bade the sound change mentioned above and discussed in detail below has produced initial [uu] (< *wu), [ii] (< *yi), [uɕ] (< *Cu), and [əɕ] (< *Cə).

²Tone marks are acute accent (´) for high tone, grave accent (˘) for low, circumflex accent (ˆ) for falling, and tick (') for downstep. The following transcription conventions should also be noted: c and j are voiceless and voiced palatal affricates respectively; sh and zh are voiceless and voiced palatal fricatives respectively; ny is a palatal nasal, analyzed as a unit phoneme, not a sequence; 'y is a glottalized palatal semivowel; t| and j| are voiceless and voiced lateral fricatives respectively; kw and gw are labialized velar stops, not stop-semivowel sequences.

³This statement is true for nouns. There may be one or two survivals of initial *i in verbs (see Table, fn. 15). If we move one historical step back, we must reconstruct initial *i in both nouns and verbs. Duwai, the most closely related language to Bade and Ngizim, has initial i, which is phonetically [ii] but does not contrast with [i] in this position, e.g. ìidà 'eye' (cf. Bade and Ngizim d̄à), ìijé 'dog' (cf. Bade and Ngizim j̄à).

Medially the long high vowels, *ii* and *uu* contrast with each other and with other vowels. There are no minimal *ii/uu* pairs, but there is no way to predict which vowel will be used on the basis of phonological environment. As we will see below, the short high vowels *i/u/ə* are not in contrast medially--the quality of a medial short high vowel is phonologically predictable. Some minimal or near minimal sets showing medial contrast between *ii* and *uu* and between these vowels and the medial short high vowel(s) are given in (3):

(3)	long high vowels		short high vowels		
	<i>zìidú</i>	<i>sìidú</i>	'slaughter'	<i>'zèdù</i> <i>èzdù</i>	'six'
	<i>víidà</i>	<i>fíidà</i>	'hare'	<i>vèdà</i> <i>èvdà</i>	'open space'
	<i>dúuzhì</i>	<i>dúuzì</i>	'owl'	<i>dèzhí</i> <i>dèzí</i>	'vein'
	<i>rùunú</i>	<i>lùunú</i>	'spread to dry'	<i>rnú</i> <i>rnú</i> (< * <i>rènú</i>)	'fornicate'

Long high vowels do not occur underlyingly in word final position. There is, however, a monophthongization rule shared by Bade and Ngizim which changes the word final diphthong *-ai* to [ii] and *-au* to [uu] when the word occurs in the middle of a phrase, e.g.

(4)	(Ng)	<i>rákài</i>	} 'bed'	<i>rákíi</i>	<i>bái</i>	} 'it's not a bed'
	(Ba)	<i>lákài</i>		<i>lákíi</i>	<i>bái</i>	
	(Ng and Ba)	<i>sésàu</i>		<i>sésúu</i>	<i>bái</i>	'it's not a hut'

The short high vowels *i* and *u* are in contrast with each other and with *a* and *aa* (also with the mid vowels *ee* and *oo*) in word final position. There are no lexical minimal pairs distinguished only by final *i* or *u*,⁴ but choice of *i*, *u*, or the absence of a vowel cannot be predicted phonologically. The vowel [ə] does not occur underlyingly word final, but word final /i/ and /u/ change to [ə] medially in a phrase under the appropriate conditions (see below).

⁴Minimal sets can be constructed in the verbal system where different verb forms are marked by final vowel changes, among other things, e.g. Ngizim *jà kèrú* 'we stole', *jà kèrì* 'that we steal', *jà kèrá* 'we should steal'.

(5)	Final i		Final u		
	nyàmí nyàmí	'fat'	kúnâmú kÿnâmú	'fan palm'	
	màrí m̀èrí	'beard'	áatárú átáíú	'ridgerow'	
	zàyí zàyí	'rope'	kwàyú ádíyú	(Ng) 'jujube'	
				(Ba) 'gourd'	
	gázábì kóosávì	'hawk'	gàbáabù dáabù	(Ng) 'billy-goat'	
				(Ba) 'middle'	
	dùkshí dùksí	'heavy'	kùtàsú dúksù	(Ng) 'shea-nut'	
				(Ba) type of weed	
	v̀èjí èvjí	'monkey'	zèdù èzdù	'six'	

Final C

kwàm kwàm	'bull'
zègér èzgéí	'foot'
gùzái ùgzái	'pubic hair'
[gùzáy] [ùgʷzáy]	
gùzép ùgzéf	'slave'
àrás àlás	'sorrel'
bébét pébèt	'ashes'

2.2. Quality of medial short high vowels. The quality of medial short high vowels is determined by phonological environment. The rule for determining the choice of [i], [u], or [ə] is given in (6).⁵

(6)	$\left[\begin{array}{c} v \\ +\text{high} \\ -\text{long} \end{array} \right]$	→	$\left\{ \begin{array}{l} i \quad \text{in the env. of } y \\ u \quad \text{in the env. of } w \text{ or labialized velar} \\ \text{ə} \quad \text{elsewhere} \end{array} \right.$
-----	---	---	--

Conditions: (1) Vowel does not precede pause.

(2) When the env. for both [i] and [u] are met, the env. following the vowel overrides the env. preceding the vowel.

⁵Phonetically a wider range of vowels than these exists. Thus, following palatals the vowel tends to be somewhat fronted, e.g. Ng j̀èjém [j̀ìj̀ím] 'thorn', and following labial fricatives the vowel tends to be somewhat rounded, e.g. Ng v̀èrú [v̀òrú] 'go out'. Also, the following environment generally exercises a stronger influence than preceding. Thus, the vowel following .w is not as strongly rounded as when preceding w, and in my field notes I have often transcribed a ə instead of a u following w but never preceding w, e.g. Ng ẁèdú or ẁùdú 'cut', but only Ng f̀ùwú 'get down', never *f̀èwú.

The conditioning environments for [i] and [u] may either precede or follow the vowel. In the transcription used here it is the vowel u which marks a velar as labialized (there are no labialized consonants at other points of articulation). Thus, in Ngizim the word for 'stomach' is underlyingly /kʷənú/ and 'heavy' is underlyingly /dèkʷʒí/, where ə is used as a cover symbol for "short high vowel". Some examples of each of the medial short high vowels are given in (7). Many more examples can be seen above and below.

(7)	[i]		[u]	
	gáyìm	gáyìm	'cat'	wùrwùrú wùdʷùdʷú 'sprinkle on'
	fìifìyú	fìifìyú	'whistle'	fùwàk fùwàk 'horn'
				kùnú kùnú 'stomach'
	[ə]			gùmcí gùmcí 'chin'
	bébét	pábét	'ashes'	dùkshí dùksí 'heavy'
	dédém	tédém	'blood'	
	kèrú	kèlú	'steal'	

As condition (2) states, if the environments for both [i] and [u] are present, the following environment takes precedence.

(8)	wíyàk	wíyàk	'vulva'
	dàakwìyà	ákʷíyà	'deaf person'
	yùwán	(no exs.) ⁶	'sleeping'

Rule (6) is not only a statement of phonetic constraints on high vowels within words but is also a productive phonological rule applying to any word final high vowel when it occurs in the middle of a phrase.

(9)	(Ng and Ba)	/áçì báí/	--->	[ácé báí]	'it's not him'
		/átù báí/	--->	[áté báí]	'it's not her'
		/átù yàayé/	--->	[átí yáayé]	'even her'
	(Ng)	/gùmcí-w/	--->	[gùmcúu]	'the chin'
	(Ba)	/gùmcí-wú/	--->	[gùmcùwú]	

⁶For reasons given below, in Bade there could never be a high vowel before y with a w or velar following.

2.3. Position of medial short high vowels. Except for word final *i* and *u*, short high vowels appear only where they are needed to break up impermissible consonant sequences. A major consonant sequence restriction can be summarized by the observation that "the maximum syllable is CVC". This restriction rules out the sequences CCC, #CC, and CC#. Numerous examples have already been seen where a high vowel appears in #C__C to break up a word initial cluster and in C__C# to break up a word final cluster. It is difficult to find examples within a word where a high vowel which breaks up a CCC sequence cannot be explained by some other sequential restriction as well. However, as with rule (6), this restriction is a productive phonological rule as well as a restriction on word formation. An example of an underlying CCC sequence broken up by a high vowel is seen in Noun + Noun associative constructions. These constructions have the form N₁-k N₂. If the first noun (N₁) ends in a consonant and the second (N₂) begins in a consonant, a three consonant sequence would result. This sequence is broken in up by inserting *ə* after the associative morpheme /k/ (see 10a). Note that no *ə* is inserted if N₁ ends in a vowel or N₂ begins in a vowel (see 10b).

- | | | | |
|---------|---------------------------------|--------------------------------------|-------------------|
| (10) a. | (Ng) /yàd ^h -k tɬà/ | --->[yàd ^h -gé tɬà] | } 'hair of a cow' |
| | (Ba) /'yàt ^h -k tɬà/ | --->['yàt ^h -ká tɬà] | |
| b. | (Ng) [tə̀ká-k tɬà] | } 'body of a cow' | |
| | (Ba) [tə̀kà-k tɬá] | | |
| | (Ng) [ám-g ákà] | } 'hot water' (lit: 'water of fire') | |
| | (Ba) [ám-k ákà] | | |

Use of high vowels to break up word initial and word final sequences is also a productive rule which comes into play when morphemes are combined. Example (11a) illustrates use of a high vowel to break up an impermissible CC# sequence, but the non-appearance of this vowel where the consonant sequence is not word final. Example (11b) illustrates the same thing for a word initial sequence. In this position examples are found only in Ngizim since Bade would have #əCC rather than #CəC (see below).

- (11) a. (Ng) rén 'fornication' but ná-rnú } 'I fornicated'
 (Ba) àrén né-rnú }
 where the consonants of the root are r-n
- b. (Ng) tẹ́fú 'he entered' but ná-tfú 'I entered'
 vẹ̀gú 'he fell' but ná-vgú 'I fell'
 where the consonants of the roots are t-f and v-g respectively

Besides these restrictions on the number of consonants which may appear in a sequence, there are also restrictions on which consonants may appear in a sequence. The most important restriction, shared by both languages, is the impermissibility of the sequence obstruent + sonorant consonant. Obstruents include all oral stops, fricatives, and affricates; sonorants include all nasals, liquids, and semivowels. Some examples of words containing obstruent + sonorant sequences separated by short high vowels are given in (12).

(12)	Ngizim	Bade			
	ázhémák	ázémák	'Acacia seyal'	but no	*azmak , etc.
	zàpènú	sàbènú	'churn'		*zapnu , etc.
	kákérà	kákélà	'load'		*kakra , etc.
	kàtèrú	ùkcèrú	'hop'		*katru , etc.
	sésúwà	tésúwà	'stalk'		*səswa , etc.
	vàvìyú	bàbìyú	'singe'		*vavyu , etc.

A more detailed discussion of sequence restrictions shared by both languages is given in section 3.2.

There are a few differences between the languages in restrictions. Bade, but not Ngizim, has relaxed the restriction against obstruent + sonorant if the obstruent is /g/. Note in (13), however, that when /g/ has been allowed to abut with a following sonorant it has also undergone phonetic changes. We will return to this point in sections 3.2 and 4.

(13)	Ngizim	Bade		
	zègè mú	sègmú	[sèŋmú]	'plant'
	má gè r á f	mègrà	[mèy r à]	(Ng) 'visitor'
				(Ba) 'grey-headed sparrow'
	mègì y á	mègyá	[mèyyá]	'ratel'

Bade, but not Ngizim, freely allows syllables of the shape CVVC (a long vowel in a closed syllable).⁷ In Ngizim, the second C belongs to a separate syllable with a short high vowel nucleus. I have found no cognates where Bade has $C_1VVC_2C_3$... and Ngizim has $C_1VVC_2\emptyset C_3$..., but the examples in (14) will illustrate the situation in the two languages.

- | | | | | |
|-----------|-----------|--------------|--------|-----------------|
| (14) (Ba) | tàagǔ | 'step on' | cf. Ng | tàkdǔ |
| | báangài | 'babbon' | cf. Ng | bángài |
| (Ng) | gáagèzhìn | 'remainder' | but no | *gaagzhin, etc. |
| | màadébéér | 'corpulence' | | *maadbér, etc. |

A restriction found in Bade but not in Ngizim prohibits the sequence obstruent + glottalized consonant.⁸

- | | | |
|-----------|--------|--------|
| (15) (Ng) | ràpdǔ | 'boil' |
| (Ba) | lápèdǔ | |

I should stress here that the epenthetic function of vowels discussed

⁷Ngizim does have a few words of the shape $C_1aaC_2C_3$ They are all verbs and they usually have a verbal noun of the form $C_1aaC_2aC_3$, e.g. kàaktlú 'measure' with verbal noun kàakátl, nànmú 'beat (drum)' with verbal noun nàánám. This restriction seems to be lexically specific word medial.

⁸This restriction seems to be lexically specific word medial. Alongside the word 'boil' given in (15) is sàpdǔ 'pound grain to remove bran' in both languages. There are also several other examples, mostly where the first obstruent is a velar, in which both languages allow a consonant sequence, e.g. ákda 'desert date' in both languages and the verb 'step on' in (14). The restriction in Bade against obstruent + glottalized consonant sequences is absolute where these are the first two consonants of a word, as will be shown in 3.2.

in this section applies only to short high vowels. Other vowels can occur freely in any position, as illustrated in (16).

- (16) (Ng and Ba) pátà 'the bush' vs. áptà 'flour'
 (Ng) mábú 'large calabash' vs. ámbàì 'locust bean cakes'
 (Ba) mázám 'blacksmith' vs. ánzèm 'groaning'

In these examples, a appears between pairs of consonants which can freely abut (p + t , m + b , m + z) or before these pairs of consonants. This freedom of occurrence is not possible for short high vowels, e.g. corresponding to the first set of words in (16), *əpta would be impossible in Ngizim and *pəta would be impossible in Bade.

3. Bade and Ngizim Word Initial Sequences

3.1. Bade PROTHESIS. A conspicuous sound change, or better, a change in word structure, has affected Bade but not Ngizim. This change can be formulated as in (17):

(17) Bade PROTHESIS

proto-Bade-Ngizim words of the structure *#C₁əC₂ ...

in Bade acquire the structure *əC₁C₂ ...

where ə = any short high vowel and C₁C₂ form a permissible consonant sequence in Bade.

It would be tempting to formulate this change as *#C₁əC₂ ... > #əC₁C₂ ..., but this formulation makes the change look like simple metathesis of *C₁ and *ə . By using the formulation in (17) and by calling this change PROTHESIS, my intention is to stress that viewing this change as a metathesis is not the correct way to conceptualize what has taken place, viz. a change in Bade in the way impermissible word initial segment sequences are avoided. The change can perhaps be viewed as involving two discrete but simultaneous steps: (i) deletion of *ə between *C₁ and *C₂ and (ii) the consequent addition of prothetic ə (what Lukas [1967/68] calls a *Stutzvokal*) to avoid the sequence #C₁C₂ Or, as an alternative, more abstract analysis, we could say that proto-Bade-Ngizim (and modern Ngizim) inserted ə between C₁ and C₂ whereas Bade now inserts ə before C₁C₂. There are cases of true metathesis in Bade, e.g. Bade pəksà ,

Ngizim fésà 'face' (< *fésà); Bade ègvú , Ngizim vègú 'fall down' (< *vègú). Cases such as these differ from PROTHESIS in that no principles of organization of the phonology of Bade have been changed--two segments have merely switched place in certain lexical items. In the case of PROTHESIS, there is a change in the phonological structure of Bade--conditions or rules for the positioning of short high vowels have changed.

3.2. Comparison of Bade and Ngizim initial sequences. The environments where PROTHESIS has *not* applied in Bade are the same as those word medial environments where a vowel is required to prevent an impermissible consonant sequence. In (18) I have a more detailed listing of the impermissible consonant sequences of Bade (and Ngizim) than was presented in 2.3. These are the sequences which must be separated by a vowel and therefore have not permitted PROTHESIS to apply in Bade.

- (18) a. identical consonants: may not come together to form geminates; this includes cases where $C_1 \neq C_2$ only with respect to voicing
- b. obst + obst: impermissible if (i) C_1 is a stop and C_2 is a homorganic fricative
 (ii) C_2 is glottalized (in Bade only, though Bade does allow /g/ + glottalized)
- all other obst + obst sequences are permissible
- c. obst + son: none permissible (except in Bade where $C_1 = /g/$)
- d. son + obst: all possible with the following qualifications
 (i) of nasals, only /m/ can disagree in point of articulation with C_2
 (ii) sporadic cases of m followed by s/z require epenthetic e
- e. son + son: impermissible if C_1 is n and C_2 is a semivowel
 all others permissible, with some variation where C_1 is m or where both C_1 and C_2 are nasals

Examples of all the possible sequences illustrating PROTHESIS or absence of PROTHESIS are given in Table 1. Discussion of (18) and Table 1 continues on page 266. Footnotes to Table 1 are on p. 265.

Table 1. Examples of PROTHESIS or absence of PROTHESIS in Bade

The left-hand word is from Ngizim, the right-hand word from Bade. Unless otherwise stated, the words are cognates with identical meaning. A notation such as (*bəd ...) means no words containing that sequence were found. Unless otherwise indicated, lines marked "no examples" probably represent accidental gaps. See the end of the Table for footnotes.

OBSTRUENT SEQUENCES

	<u>Sequence possible</u>			<u>Sequence impossible</u>		
	Ngizim	Bade		Ngizim	Bade	
<u>Stop + Stop</u>						
lab + lab				bébát	pébát	'ashes'
lab + alv	pètú	èptèkú	(Ng) 'pull out' (Ba) 'be able'			
	(*bəd ...)	èbdú	'ask'	pédém	bédú	(Ng) 'far' (Ba) 'toss up'
lab + vel	-----	-----	no examples	-----	-----	-----
alv + lab	dèbú	èdbú ⁹	'establish'	dèbú	dèbú	'water animals'
alv + alv				dédém	tédém	'blood'
alv + vel	tèkà	ètkwà	'body'			
	dègà	èdgà ⁹	'arrow'			
	dèkáu	èdkwái ⁹	(Ng) 'exceed' (Ba) 'metal'			
vel + lab	gùbàmtú	ègbàmtú	'sweel up'			

	gùbú	ùubú	'moisten'			
		< *ùgbú		(*kəb ...)	kùbú	'close'
vel + alv	kùtú	ùktú	(Ng) 'wash w.o. soap'			
			(Ba) 'take'			
	gùdú	ùgdú	'gourd'			
	gèjì	ègjì ⁹	'thirst'			
	(*ged ...)	ùudā	'haste'			
		< *ùgdā		kédén	kèdāu	(Ng) 'one'
						(Ba) 'exceed'
vel + vel				kúkú	kúkúwáu	'baobab'
<u>Stop + Fricative</u>						
lab + lab	- - - - -		no examples	- - - - -		
lab + alv	pèsú	èpsú	(Ng) 'be worn out'			
			(Ba) 'bathe'			
	bèzú	èbzú	'leave'			
lab + vel	- - - - -		no examples	- - - - -		
alv + lab	təfú	ətɸú	'enter'			
	dèvíđ	èdvóđ ⁹	'night'			
alv + alv				dèzhí	dèzí	'vein'
alv + vel ¹⁰	- - - - -		no examples	- - - - -		
vel + lab	gùvàrú	ègvàalàkáu	'Acacia nilotica'			
vel + alv	kùtláí	ùktláí	'children'			
	gèzhàn	ègzàn	'Nile monitor'			
vel + vel ¹⁰	- - - - -		no examples	- - - - -		

	<u>Sequence possible</u>			<u>Sequence impossible</u>		
	Ngizim	Bade		Ngizim	Bade	
<u>Fricative + Stop</u>						
lab + lab	- - - - -	- - - - -	no examples	- - - - -	- - - - -	- - - - -
lab + alv	fètàk	fètú	(Ng) 'hoof'			
	vèj́f	èvj́í	(Ba) 'postpone'			
			'monkey'	fédú	fédú	'four'
				vèďáú	vèďáú	'urine'
lab + vel	vègú	(*əvg ...)	'fall'			
	tɬèpú	ètɬpú	'clap'			
	zèbú	èzbú	(Ng) 'meet'			
			(Ba) 'throw away'			
	sètú	èstú	(Ng) 'sharpen to point'	(jɬàb̥ərú)	tɬèb̥əlú	'split wood'
			(Ba) 'burn'			
	zèdù	èzdù	'six'			
				zèďú	jɬèďú	'dig'
	tɬèkwàkùràk	ètɬkwàakwàl̀àk	'bark'			
	zègáú	èzgáú	'know'			
vel + lab, alv, vel ¹¹	- - - - -	- - - - -	no examples	- - - - -	- - - - -	- - - - -
<u>Fricative + Fricative</u>						
lab + lab				(*fəf ...)	fáfáú	'breast'
lab + alv	- - - - -	- - - - -	no examples	- - - - -	- - - - -	- - - - -

lab + vel ¹⁰	- - - - -	no examples	- - - - -	+	- - - - -
alv + lab	sə́fú	əśfú	(Ng) 'coax'		
	(zə̀bà̀bìyú)	ə̀zvà̀vìyú	(Ba) 'sweep'		
			'wash grain'		
				sésàù	sésàù
				(*j əj ...)	j ə̀j á
					'hut'
					'fennec'
alv + vel ¹⁰	- - - - -	no examples	- - - - -		
vel + lab, alv, vel ¹⁰	- - - - -	no examples	- - - - -		

OBSTRUENT + SONORANT¹²

obs + nas				(no ex. of lab + m)	
				bə̀nú	bə̀nú
				fə̀nà	fə̀nà
				də̀mán	də̀mán
				zə̀mànú	zə̀mànyí
				t ə̀nú	t ə̀nú
				kúnámú	kúnámú
	gə̀mà	[ə̀má]	'thigh'		
	gə̀nú	[ə̀nú]	'accept'	(but cf. Ba	gə̀nà 'like, as')
	gə̀nyí	[ə̀nyí]	'penis'		
obs + liq				bə̀lân	bə̀lân
				fə̀rà	fə̀là
				tə̀rá	tə̀rá
				t ə̀rà mú	t ə̀lè m
					'good'
					'illness'
					'moon'
					'harvest season'

		<u>Sequence possible</u>		<u>Sequence impossible</u>		
	Ngizim	Bade		Ngizim	Bade	
				kàrú	kəlú	'steal'
				(but cf. Ba	gúlú	'jealousy')
obs + s.v.	gèràbú	[èy àbú]	'be startled'	bùwà	bùwà	'trip'
				vìyú	vìyá	(Ng) 'wash'
						(Ba) 'tiger nut'
				tùwàyú	tùwàyú	'forget'
				zhìyám	zìyám	(Ng) 'molar'
						(Ba) 'cuspid'
				kùyú	kùyú	(Ng) 'grasp'
						(Ba) 'package'

(there are no examples of /g/ + semivowel word initial)

SONORANT + OBSTRUENT^{13, 14}

m + lab	mbàsú	mbàl	(Ng) 'sit'	
			(Ba) 'beer'	
	mpàatú	mpàatú	'provide for'	
	(máfíyà)	mfú	(Ng) 'breathing'	
			(Ba) 'grunt, groan'	
m + alv	mèdú	mdú	(Ng) 'tie up'	
			(Ba) 'rool into balls'	
	mètú	mtú	'die'	
	mèsèk	msèk	'husband'	
	mèzèmú	mzèmú	'grunt'	(but cf. Ba mèzèmá a type of fish)

m + vel	- - - - -	- - - - -	no examples	- - - - -
n + lab	- - - - -	- - - - -	no examples	- - - - -
n + alv	ndìiwà	ńdá	'people'	
	ńtú	ńtú	'swallow'	
	(*n(ə)s ...)	ńsì	'hippopotamus'	
/n/ + vel	ngàs	ńgàs	'spear'	
	ńkàltú	ńkú	(Ng) 'care for'	
			(Ba) 'fill'	
r/l + lab	rèpú	èlpàatú	(Ng) 'close'	
			(Ba) 'weave (mat)'	
	rènú	èlnú	'sip'	
	rèńú	èlnú	'move'	
r/l + alv	ńdú	ńdú	'crawl'	
	ńjlnú	ńjlnú	'moisten'	
	ńdńú	ńdńayú	(Ng) 'stop'	
			(Ba) 'melt'	
r/l + vel	règú	èlgú	'migrate'	
y/w + lab ¹⁵	ńivú	(*iiv ...)	'leave'	
	- - - - -	- - - - -	no w + lab	- - - - -
y/w + alv	wùtú	ùutú	'go to meet'	
	- - - - -	- - - - -	no y + alv	- - - - -
y/w + vel ¹⁵	ńikáu	ńikáu	'see'	
	- - - - -	- - - - -	no w + vel	- - - - -

SONORANT + SONORANT

	<u>Sequence possible</u>			<u>Sequence impossible</u>		
	Ngizim	Bade		Ngizim	Bade	
m + n	mènú	̀nù	'await'			
m + liq	mèr̀àk	̀l̀àk	'oil'	mènáafêk	mènáafèk	'hypocrite'
					= Ba mèl̀àk	
				(màrí)	mèlí	'beard'
					= Ba m̀iyá	
m + s.v.	m̀iyá	̀nyá	'mouth'			
n + m	nèm̀iyú	̀lm̀iyú	'flood'			
		< *̀nm̀iyú		nèmú	nèmú ¹⁶	
n + liq	- - - - -	- - - - -	no examples	- - - - -	- - - - -	- - - - -
n + s.v.	- - - - -	- - - - -	no n + w	- - - - -	- - - - -	- - - - -
				ǹiyú	ǹiyú	'swim'
r/l + m	rèmáú	̀lmáú	(Ng) 'run away'		= Ba l̀emáú	
			(Ba) 'leave'			
r/l + n	̀nú	̀nú	'fornicate'			
r/l + s.v.	rùwáí	̀lwáí ⁹	'farming'			
	r̀iyàk	̀lyàk ⁹	' <i>Andropogon gayanus</i> '			
y/w + nas	wùnú	̀unú	'spend the day'			
	(*yin ...)	̀iná	'departure'			
	- - - - -	- - - - -	no y/w + m	- - - - -	- - - - -	- - - - -
y/w + liq	wùrá	̀ulá	'neck'			
	- - - - -	- - - - -	no y + liq	- - - - -	- - - - -	- - - - -
y/w + s.v.	yùwán	̀iwàn	'sleeping'			
	(*wuy ...)	̀uyú	'hang'			

⁹There is a strong vocalic transition between the consonants but this seems not to be perceived by speakers. It is probably also present between corresponding voiceless consonants but is not so obvious because it is voiceless. I did not investigate which sequences of consonants have the strongest such transitions or how systematic it was.

¹⁰There are no velar fricatives in Ngizim or the Gashua dialect of Bade. In Gashua Bade, re-constructable *x and *ɣ have changed to k and g ; in Ngizim their fate is somewhat more complicated and need not concern us here. The Western and Southern dialects of Bade do preserve *x and *ɣ, usually pronounced [h] and [ɦ] respectively, though noticeable velar friction can still be heard with some speakers. These sounds are relatively infrequent so that there are lexical gaps for most potential sequences involving velar fricatives. Of stop + fricative sequences only the word *dəhán* 'land' is found (cf. Gashua dialect *əkà*). Absence of PROTHESIS suggests that h now functions as a sonorant though it was originally an obstruent.

¹¹See fn. 10. An example of h + d̥ is *hədāwú* 'dry up' (cf. Gashua Bade *kədāwú*).

¹²Western Bade has velar fricative + sonorant separated by high vowels in *hùnú* 'flay' (cf. Gashua Bade *kènú*), *hèrú* 'save' (cf. Gashua *kəlú*), and *hùyú* 'package' (cf. Gashua *kùyú*).

¹³In Ngizim, word initial nasals followed by a homorganic voiced stop form a prenasalized stop; the nasals are syllabic before other consonants. In Bade, all word initial nasals followed by a consonant are syllabic.

¹⁴Western Bade has sonorant + velar fricative sequences in *ḥwú* 'fill' (cf. Gashua *ḥkú*) and *əlḥú* 'say' (no cognate in Gashua).

¹⁵The examples cited here may not have been original *ɣiC ... at all. Initial *i must be reconstructed for the proto-language (see fn. 3); these may be survivals of this vowel, which has been lost in Ba and Ng nouns.

¹⁶Both Ngizim and Gashua Bade have alternative pronunciations *ləmú*. This results from a fairly common dissimilation of *n > l when a nasal follows. Western Bade has only *əlmú* for this word.

(18a) Geminate consonants are not found in native words in Bade or Ngizim except where they are separated by a morpheme boundary, e.g. Bade /wún-lì/ → [wú||ì] 'his son', Ngizim /àasék-gú/ → [àaséggú] 'the market'. Abutting obstruents must agree in voicing, so this restriction prevents pébét 'ashes' from becoming *əpbət or *əbbət, etc. Geminates do occur in a few borrowed words, e.g. Ng kákkádì, Ba kákkádú 'paper' from Kanuri.

(18b) (i) The only examples of stops followed by homorganic fricatives involve alveolars as in Bade dèzí 'vein', which does not become *ədzí; the absence of *pəf ... , *bəv ... and the absence of *kəh ... , etc. in Western Bade (cf. fn. 10) may or may not be systematic gaps in the lexicon. (ii) The restriction in Bade against the sequence obstruent + glottalized consonant which seemed to be lexical in the middle of a word (cf. (15) and discussion) is nearly absolute in word initial position, i.e. there are words like Bade sèdú 'wash' but no *əsú, etc. The only exception is /g/ + glottalized consonant. Here, PROTHESIS has applied, *g has shifted to w, and the initial high vowel has assimilated to it by rule (6), ultimately giving initial long [uu], e.g. [ùuúbú] 'moisten' < *gùúbú.

Aside from the above restrictions, all obstruent sequences are possible with the proviso in the discussion of (18a) above that abutting obstruents must agree in voicing. The voice feature of obstruents in both languages is heavily determined by environmental factors. Not only is there the rule that abutting obstruents must agree in voice but also the ubiquitous rule of final devoicing, e.g. Ng mágèráf, Ba mágèláf 'visitor' with underlying final /v/ as evidenced in the plurals mágèrèvávín and mágèlávón respectively (Ngizim also has an alternative plural mágèràfcín where /v/ is devoiced preceding the voiceless c). Moreover, Ngizim has undergone a sound change assimilating an original voiceless obstruent to voiced if the next syllable begins in a voiced obstruent, e.g. Ng gâazá 'chicken' (cf. Hausa kàazáa). Bade has undergone just the opposite dissimilation process of devoicing an original voiced obstruent if the next syllable begins

in a voiced obstruent, e.g. Ba kádùwà 'Grimm's duiker' (cf. Hausa gàdáa).¹⁷ Given the unstable nature of the voicing feature of obstruents in this language group, it is not surprising to find that PROTHESIS in Bade has applied with obstruent sequences, whether or not the consonants originally agreed in voicing, e.g. Ba èzdù 'six' (cf. Hausa shídà), ègdém 'crocodile' (cf. Hausa kádàa).

(18c) Both in the middle of a word and word initial, the restriction against the sequence obstruent + sonorant is absolute. The relaxation of this restriction for /g/ + sonorant in Bade (but not Ngizim) shows some dialect variation in Bade. Gashua Bade has gone about the furthest of any dialect here, but even Gashua Bade speakers freely allow pronunciations such as gè má 'thigh' and gèl àbù 'startle' as alternatives to the pronunciations given in Table 1. Also, a few lexical items seem not to admit a variant where PROTHESIS has applied (see Table 1).

In sequences where obstruents are generally disallowed as the first of abutting consonants, then, the restriction in Bade has been relaxed only for /g/. But even here a phonetic [g] is not found. In (19) the effects of following consonants on /g/ are summarized:

(19)	/g/	→	[w]	/	_____	[+glottalized]
			[ŋ]	/	_____	[+nasal]
			[ɣ]	/	_____	$\left[\begin{array}{c} \text{C} \\ +\text{sonorant} \\ -\text{nasal} \end{array} \right]$ ¹⁸
			[g]			elsewhere

¹⁷These sound changes have affected obstruents only when the following syllable began in a voiced obstruent. Thus, Ngizim has kèrú 'steal' without voicing of k (cf. Karekare čèrú-) and Bade has gèlú 'grow old' (cf. Kirfi gèarò 'old') without devoicing of g. There are no productive alternations resulting from these changes in Ngizim or Gashua Bade, but in part of the Western Bade area alternations such as the following are found: tés-jláví 'seated' but dè-tlávà 'pierced'.

¹⁸Though there are no words with original *#giy ... > #egy ..., Bade /g/ → [ɣ] / ____y was seen in mèyyá 'ratel' in (13). I know of no words with the original sequence *guw. Presumably these would become [gʷ] in Bade since labialized velars contrast with plain velars, e.g. gáyìm 'cat', gwàyi 'Acacia albida'.

Since [ŋ] and [ɣ] are not phonemic, words with these phonetic consonants can still be analyzed as having underlying /g/. Variant pronunciations with [g] probably protect the underlying status of /g/ in such words. Note that there are some words without variant pronunciations where original *g before liquids has become [w], causing merger with original *w, e.g. áuláí 'hare'--cf. Western Bade ágùrén .

(18d) Sonorant + obstruent sequences are all possible. Only the sequence m(ə) + obstruent needs some comment. The phonemic nasals are /m, n, nɣ/, but only m may disagree in point of articulation with a following obstruent, e.g. ìtú 'die' but no *nb ... , *nyt ... , etc. There are no words in either Bade or Ngizim with the sequence m + velar. The absence of an initial sequence *mə + velar is probably an accidental gap (the word *mégìyá 'ratel' seen in (16) has such a sequence, but Bade has changed this to [mêγγá], not *əmgiya). The absence of such sequences within a word is apparently the result of an old assimilation process *m > ŋ / ____velar, which is probably no longer productive. Evidence for this assimilation is found in the single word [d̥ãŋkú] 'sew' in both languages (cf. Hausa d̥ĩmkàa) with the Bade verbal noun d̥ámák . The antiquity of the assimilation is seen from the reanalyzed Ngizim verbal noun, d̥ánák , with /n/ substituted for */m/.

PROTHESIS has always been applied in Bade when the consonant following m is any labial or when it is an alveolar stop. It has usually been applied when the next consonant is an alveolar fricative, e.g. ìnzèmú 'groan', but with a few lexical items it has not, e.g. mèzèmá 'the fish *Gymnarchus niloticus*', mèzèlí 'day after tomorrow'.

(18e) With the sole exception of n + semivowel, all sonorant sequences are possible. There are no examples of original *nuw ... , but words such as Bade kàancínùwà 'merciful' suggest that *nw is impossible as is the sequence n + y illustrated in Table 1. When C₁ is m there is some variability if the next consonant is n or a liquid (the only word with m semivowel is 'mouth', which has variants both with and without PROTHESIS in Bade). The only words I found with *mən ...

are given in Table 1: Bade has undergone PROTHESIS in one but not the other. If C_1 is m and C_2 is a liquid, some words have variants with and without PROTHESIS ($\grave{m}l\grave{a}k = m\grave{e}l\grave{a}k$ 'oil'), some do not have a variant with PROTHESIS ($m\grave{e}l\acute{f}$ 'beard').

Original $*n$ can abut with m but in the only examples that I know of in Gashua Bade, $*n$ has dissimilated to $[\text{ɿ}]$, viz. $\grave{e}lm\grave{y}\acute{u}$ 'flood' and $k\grave{a}lm\acute{u}$ 'beat drum' (cf. Bade verbal noun $k\grave{a}n\acute{a}m = k\grave{a}l\acute{a}m$ and Ngizim $k\grave{a}n\acute{m}\acute{u}$). Even the word $n\grave{e}m\acute{u}$ 'build', where for some reason PROTHESIS has not applied, there is a variant pronunciation $l\grave{e}m\acute{u}$ (cf. fn. 16). Note that there are variants with $[n]$ and $[\text{ɿ}]$ only where the phoneme in question was originally $*n$, not where it was a liquid (cf. Bade $\grave{e}lm\acute{a}u = l\grave{e}m\acute{a}u$ 'run away' < $*r\grave{e}m\acute{a}u$, but never $*n\grave{e}m\acute{a}u/*\grave{e}nm\acute{a}u$). There are no examples of n + liquid. This may or may not be an accidental gap, but note that n + liquid would become a geminate liquid by a productive assimilation rule, e.g. Ba $/w\acute{u}n-l\grave{i}/ \rightarrow [w\acute{u}l\text{ɿ}]$ 'his son'.

In Bade when PROTHESIS has applied where C_1 is a nasal or liquid, the phonetic result is not always $\text{əCC} \dots$. Rather, no initial ə is found, nasals become syllabic, and liquids become syllabic before alveolars¹⁹ (but not consonants at other points of articulation). This is consistent with the analysis of the change in Bade on p. 256, where I stated that the initial ə was a prothetic vowel added to avoid an initial consonant sequence, not the original $*\text{ə}$ which had switched places with the preceding consonant. In those cases where the initial consonant can itself constitute the full syllable, no prothetic vowel is needed for this purpose.

¹⁹Two sound changes are relevant here. The original $*/r/$ of proto-Bade/Ngizim (perhaps proto-Chadic) was phonetically a "retroflex flap" as it still is in Ngizim (see Ladefoged [1964] for a phonetic description of the same sound in Hausa). In Bade/Ngizim (and probably proto-Chadic) this phoneme is realized as an alveolar tap or trill when followed by alveolar non-continuants (f, d, \acute{d}, n) or lateral fricatives. In Gashua Bade the retroflex flap, but not the alveolar tap/trill has changed to l . Thus, while Bade has $\grave{e}lv\acute{u}$ 'sip' and Ngizim has $[r\grave{e}v\acute{u}]$ with a retroflex flap initial, both languages have $[r\acute{n}\acute{u}]$ 'fornicate' with syllabic alveolar trill.

have initial low tone, making it likely that the words should all be reconstructed with initial low tone; second, and more important, are Bade examples such as the following, where PROTHESIS has not applied:

(21)	péjɪ	'bran'	cf.	èpcàalàkáu	'the plant <i>Calotropis procera</i> '
	tébbá	'round cover'	cf.	èdbú	'establish'
	dégà	'platform'	cf.	èdgà	'arrow'
	dúkwàk	'udder'	cf.	èdkwái	'iron'
	kúvá	'chest'	cf.	ègvàalàkáu	' <i>Acacia nilotica</i> '
	kúzìyák	'swollen scrotum'	cf.	èksédù	'be familiar with'
	súgúm	'planting hoe'	cf.	èzgè mú	'plant'
	sévùwà	'bee'	cf.	èzvú	'join'
	gúmà	'ten'	cf.	[èŋmá]	'thigh'
	lévùwà	'chaff'	cf.	èlvú	'sip'
	wúddú	'knife'	cf.	ùutú	'go to meet'
	mésáakáu	'tamarind'	cf.	msèk	'husband'
	wúnyà	'girl'	cf.	ùunú	'spend the day'
	míyà	'100'	cf.	myá	'mouth'
	wíyàk	'vulva'	cf.	ùuyú	'hang'

The only relevant difference between the words in the left-hand column, where PROTHESIS has not applied, and those in the right-hand column, where it has, is the tone on the first syllable. A careful examination of the Bade nominal lexicon reveals that all words where PROTHESIS has applied have initial low tone and the large majority of those where PROTHESIS could potentially have applied but has not have initial high tone. I will return to the few exceptions to this statement in 3.2.3.

Nouns have fixed lexical tone so nouns can be categorically listed as having initial high or low tone. Underlying tone of verbs is not so obvious since tone is in part conditioned by verb aspect. However, it is a reconstructable feature of proto-Bade/Ŋgizim as well as a feature of the modern languages that verbs having *Cə as the initial syllable have a verbal noun with initial low tone. It is not at all clear that

the verbal noun should be taken as the underlying form of the verb, but all verbs of the original structure $*C_1\text{ə}C_2V$... where C_1 could abut with C_2 have undergone PROTHESIS whereas verbs with other reconstructed syllabic structures have not (but see section 3.2.2). This restructuring of original $*C_1\text{ə}C_2V$... verbs may have been reinforced by the low tone which verbs take in other aspects (perfective, second subjunctive).

The question which arises is why high tone has prevented PROTHESIS. A final explanation would require a more careful phonetic study than I was able to make, but in Schuh [1977b] I suggest that the extra amplitude associated with high tone was enough to prevent weakening of the ə separating C_1 and C_2 to the point where it could be lost. Since the $\#C_1\text{ə}C_2$... structure was thus maintained, no prothetic vowel was needed.

3.2.2. Syllabification with longer sequences. The discussion above has concentrated on examples where Ngizim has $C\text{ə}CV$... and Bade has $\text{ə}CCV$... with the remainder of the word being the same, other things being equal. There are words with three or more consonants, $C_1C_2C_3...$, where both the sequence C_1C_2 and the sequence C_2C_3 are permissible. If C_2 and C_3 are allowed to abut, PROTHESIS would not be possible in Bade because PROTHESIS in a word of the structure $C_1\text{ə}C_2C_3...$ would form an impermissible three consonant cluster. On the other hand, if C_1 and C_2 are allowed to abut through PROTHESIS, C_2 and C_3 will have to be separated by ə , again to prevent a three consonant sequence, giving a word structure $\text{ə}C_1C_2\text{ə}C_3$ With a number of exceptions, Bade has chosen the latter strategy so that words of the form $\text{ə}CC\text{ə}C$... in Bade correspond to words of the form $C\text{ə}CC$... in Ngizim.²⁰ In words where C_2 and C_3 cannot abut, Bade again has $\text{ə}CC\text{ə}C$... but Ngizim has $C\text{ə}C\text{ə}C$...; where C_1 and C_2 cannot abut, both languages have $C\text{ə}CC$...; where C_1 cannot abut with C_2 nor C_2 with C_3 , both languages have $C\text{ə}C\text{ə}C$ Examples of all these combinations are given in Table 2.

²⁰This strategy of syllabification in Bade is consistent with the position into which ə is inserted as illustrated in (10a), viz. between the second and third consonants rather than the first and second.

Table 2. Examples of syllabification in words with 3 or more consonants

The left-hand column is Ngizim, the right-hand column is Bade.

C₁, C₂, and C₃ can all abut

dègzú	èdgdèzú	(Ng) 'fuck' (Ba) 'copulate (animals)'
pèstú	èbzèkú	(Ng) 'split palm fronds' (Ba) 'today'
zùktú	èzgdètú	'pierce'
rèptú	èlbètú	'open'
rèbgú	èlbègú	(Ng) 'destroy' (Ba) 'stove in'

C₁ and C₂ can abut, C₂ and C₃ cannot

(gùjlàjílú)	ùgdjàjílú	'wake up'
gùjlàjìr	ùgdjàrgùjìér	(Ng) 'loose bark' (Ba) 'lower back'
sèkùnú	èskùnú	'increase'
mèzèmú	ṁzèmú	'groan'
nèmìyú	èlmìyú	'flood'

C₁ and C₂ cannot abut, C₂ and C₃ can

tèrkú	tèlkú	'orphan'
vèrdá	vèrdá	'first ripe heads of millet'
bèntú	bèntú	(Ng) 'pass by' (Ba) 'narrowly miss'
sèmdú	sèmdú	'sneak up on'

Neither C₁ and C₂ nor C₂ and C₃ can abut

(jlàbèrú)	tlàbèlú	'split wood'
(wùdú)	kèdúwú	'dry up'
dèmìyú	----	'guard'
gùgùyú	----	'shake (blanket, etc.)'

High tone on the initial syllable has prevented C₁ and C₂ from coming together in Bade just as illustrated in (21) for words of the structure C₁əC₂V Thus, for words in Bade beginning with high tone, when C₂ and C₃ can abut they do; when they cannot abut they are separated by a high vowel, but always with a high vowel separating C₁ and C₂ as well. The examples in (22) are all from Bade.

(22) C ₂ and C ₃ can abut	C ₂ and C ₃ cannot abut
légdà 'ladle'	cékúdàk 'adze'
đúksù 'the weed <i>Mitracarpum scabrum</i> '	đúkúmàk 'tweezers'
ségyà 'spur-winged goose'	kúterú 'puppy'
gúskwàk 'worm'	métlélèm 'cobra'
kúzvú 'female slave'	wújélài 'trilling'
[lâyá] 'small calabash'	sévìyák 'elephant snout fish'
[cə̀nà] 'molar'	lévùwà 'chaff'
wúrjí 'scorpion'	
wúrnàk 'burnt mush'	

There are very few words with four or more consecutive consonants where any two consecutive consonants could abut and where only short high vowels intervene. The only two examples, aside from a number of reduplicated forms (see section 3.2.3), that I have found in Bade are tək̀pəsú 'begin' and mə̀skətú 'turn'. Words such as those in the first two sections of Table 2 suggest that the principle behind Bade PROTHESIS might be stated as in (23):

- (23) "(1) If the first two consonants of a root form a permissible sequence and are not separated by a vowel other than a short high vowel, let those consonants abut and add prothetic ə ;
 (2) if no vowel follows C₂, add epenthetic ə and proceed by grouping the next two consonants if possible."

Such a principle would predict *ət̀k̀pəsú and *mə̀skətú . In fact, there are no words in the language which have been syllabified in this way

where the proto-form was *CəCCəC ...²¹ I have no formal explanation for why tək̀pəsú has not become *ət̀k̀əpsú, but if one considers the string of operations speakers would have had to go through to convert the former into the latter during the period when PROTHESIS was a change in progress, one can well imagine why this and the few other words like it would have resisted change. The change of words like *l̀əptú 'open' to ə̀l̀ə̀tú also involves a fairly radical restructuring so it is not surprising that a fairly large proportion of the verbs and several nouns having three consonants where PROTHESIS and resyllabification could have taken place have also resisted the change, e.g. t̀ə̀ktliú 'trace designs' ✗ *ət̀k̀ə̀tliú, l̀ə̀ktú 'bring ruin' ✗ *ə̀l̀k̀ə̀tú, d̀ə̀bdú 'sell' ✗ *ə̀db̀ə̀dú, [sə̀ŋmú] 'plant' ✗ *ə̀zgə̀mú (this word has become ə̀zgə̀mú in Western Bade), k̀udvú 'carry on back' ✗ *ùgdə̀vú (but cf. verbal noun ùgdə̀f), t̀l̀ə̀fci 'worn out mat' ✗ *ət̀l̀fə̀ci.²²

In fact, there are very few words of three or more syllables which have undergone PROTHESIS even if it would have affected only the initial syllable. For long words the principle for deciding on clustering seems to be as in (24):

- (24) "Find the first obligatory vowel, allow the two consonants preceding that vowel to abut if possible, and add ə before them."

²¹The Bade words ùg̀j̀l̀ə̀rg̀ù̀j̀l̀ér 'lower back' and ùg̀zə̀mtəm 'marabou stork' have the structure əCCəCCV ..., but in these words the reconstructed shape would be *CəCəCCV ..., not *CəCCəCV ...

²²I collected 24 verbs with three consonants, any two of which could abut and which were separated only by high vowels. Of these 24, 11 have the structure CəCCə, 13 have əCCəCu. An alternative explanation for these verbs not being restructured is a tonal one, viz. verbs with an initial syllable CVC must be reconstructed as having high tone verbal nouns. PROTHESIS seems to have taken place only sporadically with verbs other than those having low tone verbal nouns (see section 3.2.1). Among nouns I found only 8 clear examples with the relevant structural characteristics: ə̀bzə̀kú 'today', ə̀gzə̀gà 'herd', d̀uksí 'heavy', k̀ə̀ské 'easy', t̀l̀ə̀fci 'worn out mat', mə̀gbá 'monitor lizard', [mə̀ỳrà] 'grey-headed sparrow', ẁur̀'ýí 'fart'. The word k̀ə̀ské is a Kanuri borrowing and borrowings have usually not undergone PROTHESIS (see sec-

syllabification in (23) must not be overridden by that in (24), which applies mainly to words of three or more syllables. There are some true exceptions to PROTHESIS--words where no phonological or morphological factors predict that the word should not have undergone PROTHESIS, e.g. *dègèrìyà* 'barb' (a type of fish), *dèvàarák* 'crownbird', *gètél* 'abandoned town site', *gùtlámflèm* 'strong smell', *dùgwú* 'hear'. In the materials I collected, true exceptions such as these total only 10-15 as opposed to well over 200 words where PROTHESIS has applied. Besides these true exceptions, there are several classes of apparent exceptions which have resisted PROTHESIS for morphological or other reasons.

Relatively recent borrowed words have not been affected by PROTHESIS, e.g.

(26)	<i>gùzèrì</i>	'provisions'	<	Hausa	<i>gùzúrí</i>
	<i>dèpú</i>	'1000'	<	Kanuri	<i>débú</i>
	<i>kèské</i>	'easy'	<	Kanuri	<i>kèské</i>

Two types of verbal nouns have not been affected by PROTHESIS. One type, illustrated in (27a), derives from verbs of the shape CaCV. These verbal nouns end in *-i* and the underlying /a/ of the initial syllable assimilates in height to this *-i* to become *ə*. The verbs 'die' and 'know' have irregular verbal nouns of a similar structure and have not been affected by PROTHESIS, though interestingly the verbs have been. The second type of verbal noun, illustrated in (27b), is derived from some verbs of the structure CVCC_U. These verbal nouns have the structure CV₁CV₂C where V₁ is the vowel of the first syllable of the verb root and V₂ is sometimes the same as V₁, sometimes *a* even where V₁ is *ə*.

(27) a.	<i>kètí</i>	'returning'	<	<i>kàtáú</i>	'return'
	<i>gèfí</i>	'catching'	<	<i>gàfáú</i>	'catch'
	<i>wùní</i>	'sending'	<	<i>wànú</i>	'send'
	<i>mètú</i>	'death'	<	<i>ntú</i>	'die'
	<i>sègí</i>	'knowledge'	<	<i>èzgáú</i>	'know'

b.	zàgém	'planting'	<	[sèŋmú]	'plant'
	tàkétl	'tracing'	<	tàktlú	'trace'
	dègès	'copulation'	<	dègzú	'copulate'
	lùwái (= àlwái)	'farming'	<	lùuyú	'farm, hoe'
	(but cf. ùgdáf)	'child on back'	<	kùdvú	'carry on back'

Next, statives, which are derived from verbs with a prefix *də-*, have been preserved with initial *də-* with all verbs.

(27) c.	dèkwáadá	'spoiled'	<	kwáadú	'spoil'
	dèbàkí	'roasted'	<	bàkú	'roast'

Finally, reduplications have uniformly resisted restructuring to permit PROTHESIS.

(28)	dègdèkí	'perch (fish)'
	dèvdèfá	'greasy'
	cèkcèkú	'sift'
	sùksùkwú	'loosen'
	kùzgùzú	'teach'
	kèt kètú	'scratch ground'

To permit PROTHESIS these words would have to be totally restructured, e.g. *èckèckú. Their failure to undergo PROTHESIS may be explained as well by resistance to this type of restructuring (cf. discussion of *tèkpèsú*, p. 275) as by their reduplicated structure.

4. Bade/Ngizim and Universal Principles of Syllabification

The discussion to this point has concentrated on noting sequences of segments which are possible or impossible and designating how such sequential restrictions are maintained by placement of vowels. In this section I hope to show how a single statement for possible syllable types in Bade/Ngizim, combined with certain hierarchies of segments, can unify what has been basically a list of restrictions.

The general principle restricting possible Bade/Ngizim syllable types can be stated as in (29):

(29) No syllable in Bade or Ngizim may have more than one consonant at either margin, i.e. the maximum syllable is CVC.

This automatically accounts for the impermissible sequences CCC, #CC, and CC#. In order to account for the permissibility or impermissibility of the sequences listed in (18), we must refer to some proposed universal hierarchies of consonant types and principles of syllabification.

Observations on the organization of phonological segments dating at least to Saussure and supported by a variety of phenomena in a number of languages point to hierarchies of consonantal "strength" along certain parameters (some of the linguists most recently concerned with this issue are Foley, Vennemann, and Hooper--see Hooper [1976:195 ff.] for references and discussion). The most frequently noted hierarchy is along a parameter called "sonority" or "openness". Cross-cutting this hierarchy are two further hierarchies, given in (30b) and (30c):

- (30) a. Sonority: stop > fricative > nasal > liquid > semivowel
b. Phonation type: voiceless > voiced > glottalized
c. Point of articulation: labial > alveolar > velar
(read > "is stronger than")

In addition to these hierarchies based on inherent characteristics of segments there are hierarchies of strength associated with position of a segment in a string of segments. Of interest here is the relatively greater strength of syllable initial position over syllable final position, evidenced by such phenomena as the frequency of neutralization or loss of syllable-final consonants as opposed to the relative infrequency or non-existence of such phenomena in syllable initial position. Positional strength correlates with inherent strength of segment types, so there is a rough hierarchy of suitability for initial and final positions in syllables [Hooper 1976:196]. Those segment types in descending order from left to right in (30a) are more "suitable" as syllable initial consonants, those ascending from right to left as

syllable final. This is seen, for example, from the fact that in many languages, syllable initial sequences such as *tr* , *zy* , etc. are possible, whereas *rt* , *yz* are rare if they exist at all. On the other hand, many languages allow only sonorant consonants in syllable final position, whereas few if any allow only obstruents in this position.

Languages show minor individual variations in the hierarchies in (30) and variations in the way syllabification is done, e.g. some languages have ambisyllabic consonants while others do not, in some languages morphological boundaries affect syllabification, etc. Nevertheless, there is a high degree of cross-language predictability of how strings of segments will be syllabified which follows from the observations above. The three following statements for Bade and Ngizim would have counterparts in many languages: (1) a weak segment can always come in direct sequence with a following strong one since syllabification will always be between the two segments, e.g. Ngizim *tàr=kú* 'orphan' because the sonorant *r* is weaker than the stop *k* (the symbol = represents syllable boundary); (2) a segment can usually come in direct sequence with one of relatively equal strength since syllabification will normally be between the two, e.g. Bade/Ngizim *áp=tà* 'flour', but there is some variation with certain pairs of segments (see below); (3) a strong consonant cannot occur in direct sequence with a relatively weak one because syllabification would come at the beginning of the sequence, e.g. there could be no word **təkru* . This would be syllabified *tə=kru* , as such sequences invariably are in languages that allow them, producing an impermissible syllable of the shape CCV, disallowed in Bade/Ngizim by (29). Bade and Ngizim assure that such syllables will not occur by requiring that a vowel separate such sequences of consonants; words which have as their first two consonants a strong consonant followed by a weak one comprise the largest set of cases where PROTHESIS has not taken place in Bade.

With these observations in mind, let us consider in turn each of

the types of segment sequences listed in (18b-e):²³

- obstruent + obstruent: Nearly all such sequences are possible, indicating that the strength differential between obstruents is not great. A stop may even be followed by a non-homorganic fricative, e.g. Ba ɛ̀tfú 'enter'. But if the fricative is homorganic to the stop, i.e. if everything between the segments is equal except their relative position on the sonority hierarchy, then they cannot occur in sequence, e.g. Ba d̀əzí 'vein' (not *ɛ̀dzí). In (30b) glottalized stops are claimed to be weaker than non-glottalized. This accounts for the fact that PROTHESIS has never taken place in Bade words where the first two consonants are plain obstruent + glottalized stop. The relative weakness of glottalized stops is supported by independent evidence as well: Le Saout [1974] describes a variety of phenomena in some Kwa and Mande languages where glottalized sounds pattern with sonorants, not obstruents; in Hausa, glottalized k in some dialects is weakened to ʔ (classed as a glide in some frameworks), not to a corresponding obstruent; tonal phenomena in Bade are more easily described if glottalized sounds are classed with sonorants than with obstruents. Nonetheless, glottalized stops must not be radically weaker than plain obstruents since there is no restriction on other obstruents abutting with them in Ngizim, and word internal in Bade, the restriction is only sporadically observed (see (15) and discussion).

- obstruent + sonorant: Such sequences are impossible, except for /g/ + sonorant in Bade. Recall, however, that when this sequence occurs in Bade, /g/ changes to [w], [ŋ], or [ɣ] depending on what follows (see (19)), so that the phonetic form of the word will automatically be syllabified between /g/ and the next consonant.²⁴ The

²³In (18a) sequences of identical consonants, i.e. geminate consonants, are excluded. This restriction is unrelated to questions of syllable structure. In the few words where geminates are found, syllabification is between the consonants.

²⁴This is assuming that the sound symbolized ɣ is classed as a sonorant rather than an obstruent. This is reasonable, considering the phonetic facts. The ɣ is very lightly articulated, approaching [ɦ].

question is why /g/, an obstruent, should be allowed to abut with sonorants in the first place. The answer seems to be that /g/ is virtually the weakest obstruent in Bade (being velar, it is at the weakest point of articulation, and being voiced it is the weakest velar, since there is no glottalized velar). It therefore approaches sonorants in the strength hierarchy and with the slight phonetic adjustments which are made it can be brought down to equal strength with sonorants, hence calling for a syllable boundary between it and the following sonorant rather than before it. This borderline status of /g/ on the strength hierarchy also provides an explanation for why some words in Bade show variant pronunciations, e.g. òmá = gèmá 'thigh', and others do not allow /g/ to abut with a sonorant at all, e.g. gèná 'like, as', gùlú 'jealously'. While the placement of syllable boundaries with most consonant sequences can be unequivocally determined, e.g. =trV but never *t=rV, b=g but never *=bg, the placement of syllable boundary with /g/ + sonorant is less firm. The result is that whether /g/ is allowed to abut with a following sonorant has been determined on a word by word basis.

- sonorant + obstruent: All such sequences are possible with sporadic lexical exceptions where m is followed by s or z (see below for discussion).

- sonorant + sonorant: Most such sequences are possible, but there is more variation here than with other types of sequences. This is especially true in the cases where one of the consonants is a nasal. If the first consonant is /n/ and it is followed by a nasal, it frequently dissimilates to l, in which case it may come in contact with a following nasal since liquids are weaker than nasals, e.g. èlmìyú 'flood' < *ènmìyú. However, /m/ never dissimilates and it is with /m/ as the first of the sequence that the most variation occurs. Nasals are ambivalent since by their oral closure they resemble obstruents, yet by their non-obstructed airflow they are sonorants. Because of this ambivalence we find variation in whether m may come in contact with s or z (i.e. fricatives, which fall immediately above nasals in

strength) and with other sonorants (liquids, which fall immediately below nasals in strength). For specific examples, see above, p.268.

In summary, we see that hierarchies of "strength" and principles of syllabification that have been proposed as possible universal features of language allow us to predict fairly accurately the types of consonants which may or may not occur in sequence in Bade and Ngizim, when combined with the statement of permissible syllable types given in (29). This means of predicting possible sequences of consonants in turn allows us to predict where the change termed PROTHESIS could occur in Bade.

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INACCESSIBILITY AND DEMOTIONAL
NOMINAL MARKING IN IRAQW*

Gerard M. Dalgish

This paper is a description of Iraqw syntax and a characterization of a particular nominal suffix which appears to signal syntactic inaccessibility to certain rules. It will be proposed that this suffix signals inaccessibility that is the result of a demotion in grammatical relation of the particular object NP's under consideration. That is, the suffix signals both relational demotion and a concomitant syntactic inaccessibility.

0. Introduction

The paper will begin with a short description of some basic aspects of Iraqw syntax relevant to this discussion. Then, more complicated two-object verb paradigms are discussed. After this, various syntactic rules will be shown to operate on certain object NP's, and the restrictions on these rules will be discussed. The paper concludes with a characterization of a certain nominal suffix which signals relational demotion and syntactic inaccessibility.

1. Background Information

Iraqw is spoken in Mbulu Region in Tanzania and has been tentatively classified as Southern Cushitic. Neutral word order is SOV. The verb may be marked for first person singular subject and, in some cases for masculine and feminine second and third person singular subject. There are tonal distinctions for third singular masculine and feminine subject forms of the verb, but tone is not indicated here. Nouns have singular and plural forms, and some demonstrative elements are suffixes.

The outstanding feature of Iraqw syntax is the complicated system

*I would like to thank the speakers of Iraqw whom I consulted during my research: Mr. Sulumo, Mr. Sulle, and Mr. Harri, all from Mbulu. Helpful comments from Mr. E.D. Elderkin and Mr.

of elements called "selectors" by Whiteley [1953]. These usually appear pre-verbally (under conditions to be discussed) and may mark person, number, gender, and case of various verbal arguments, as well as such diverse features as Relative Clause Formation (REL), Passive (PSV), tense, mood, Question (Q) Formation, and others.¹ In the examples of this paper, the selectors (SLTR's) will fall into two types: (a) those appearing after the subject but before the first object and (b) those appearing after the first object. Schematically then, the two types are:

- (a) Subject - SLTR - Object - Verb
- (b) Subject - Object - SLTR - Verb

Examples of the two types are given below:

- (1) a. ?aniŋ ?a ?inos lohis
lsg SLTR,pres 3sg carry
'I am carrying her'
- b. ?aniŋ ?inos ?a² lohis
lsg 3sg SLTR,fut carry
'I will carry her'

These examples show that the word order type is relevant for the determination of Tense, since the SLTR ?a appears in both sentences. Consider these additional examples showing the function of the SLTR's (or part of a SLTR) in masculine/feminine agreement:

- c. ?aniŋ ?inos ?a-na lohis
lsg 3sg SLTR-past carry
'I carried her'

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¹See Bradfield [1977] for a list of the features of the SLTR's.

²Whiteley [1953] lists ?an for the future SLTR, but I did not encounter this item in my research.

- d. ʔaniŋ ʔawata ʔu lohis
 lsg man SLTR carry
 'I will carry the/a man'
- e. ʔaniŋ ʔawata ʔu--na lohis
 lsg man SLTR-past carry
 'I carried the/a man'

These examples lead to the following generalizations applicable to the pattern of SLTR agreement in this paper:

"The SLTR agrees in gender and number with the NP immediately preceding."

It should also be pointed out that the SLTR varies with respect to the subject as well (even when absent):

- f. ʔawata ʔameni ga--na lohis
 man woman SLTR-past carry
 'the man carried the/a woman'
- g. ʔawata naʔay gu--na lohis
 man child SLTR-past carry
 'the man carried the/a child'

These examples show SLTR agreement with the subject ʔawata and with the feminine and masculine objects ʔameni and naʔay. Thus, SLTR's agree with subjects, and will agree with objects when the SLTR's directly precede said objects.

This paper will be primarily concerned with an investigation of a nominal suffixal morpheme which I will call an "inaccessibility marker" (IM). In my reading of the published accounts of Iraqw, I can find no reference to this element, nor to its syntactic function. Its basic shape is probably /-(C)i/ with non-high tone,³ and the phonetic form of the consonant is probably determined by the preceding stem-final segment, but I am not at this time prepared to state exact phonological details. But the impact of this element on the syntax of the language is considerable. It will be shown that any non-subject NP marked with the IM may not be Topicalized, Passivized, Relativized,

³This element is not to be confused with a sometimes segmentally identical demonstrative (DEM) morpheme, also at times /-Ci/, but with distinctly high tone.

or WH-Questioned; nor may this IM-marked NP appear in a position to govern SLTR agreement. It appears that prepositional objects and underlyingly direct objects may, under appropriate conditions, be suffixed with this element. In later sections we shall return to discuss the relevance of this for the notion of "demotion" in Relational Grammar.

2. Word-Order Permutations and the IM

The following examples illustrate the various permutations in types (a) and (b) word order, in sentences with the verbs allowing more than one object complement.

- (2) a. ?aniŋ ?a barwito?o-r hanmis⁴ dir hawata
 lsg SLTR letter-DEM give to man
 'I am giving the letter to the/a man'
- b. ?aniŋ ?a { barwito?o-r hawat--i } hanmis
 lsg SLTR { letter-DEM man--IM } give
 { hawat-i barwito?o-r }
 { man-IM letter-DEM }
 'I am giving the letter to the/a man'
- c. ?aniŋ ?a { barwito?o--ri } hawat-u hanis
 lsg SLTR { letter-IM man-DEM } give
 { hawat-u } barwito?o-ri
 { man-DEM } letter-IM
 'I am giving the man the/a letter'

Notice that once the preposition *dir* is deleted, either *hawat-* or *barwito?o-* must appear with the IM. Sentences without such IM's are ungrammatical. Note that either unmarked or IM-marked NP's may appear immediately before the verb in these type (a) sentences.

In the following type (b) sentences involving the future tense, the SLTR agrees with the object, but as we shall see, with only one object:

⁴The element *hanmis* varies with *hanis* 'give' in that the former appears in present tense, while the latter in past and future examples. Also attested is *harmis* for the same item, indicating some dialectal variation.

- (3) a. ?aniŋ barwito?o ?a hanis dir hawata
 lsg letter SLTR give to man
 'I will give the/a letter to the/a man'
- b. ?aniŋ barwito?o ?a hawati-i hanis
 lsg letter SLTR man-IM give
 'I will give the/a letter to the/a man'
- c. ?aniŋ hawata ?u barwito?o--ri hanis
 lsg man SLTR letter-IM give
 'I will give the/a man the/a letter'

Compare the SLTR's in (3b) and (3c). In the former, the SLTR agrees with the feminine barwito?o, while in the latter, the SLTR is masculine in agreement with hawata. Again, sentences without IM's would be ungrammatical, as are any of the following logically possible permutations:

- d. *?aniŋ barwito?o-ri ?a hawata hanis
 lsg letter-IM SLTR man give
- e. *?aniŋ hawat--i ?u barwito?o hanis
 lsg man-IM SLTR letter give
- f. *?aniŋ $\left\{ \begin{array}{ll} \text{hawata} & \text{barwito?o-ri} \\ \text{man} & \text{letter-IM} \end{array} \right\} ?a \text{ (or: ?u) hanis}$
 lsg $\left\{ \begin{array}{ll} \text{barwito?o} & \text{hawat--i} \\ \text{letter} & \text{man-IM} \end{array} \right\} \text{SLTR (SLTR) give}$

These examples illustrate that the SLTR may never agree with an IM-marked NP. Since, as has already been pointed out, SLTR agreement is always with the immediately preceding NP, it follows that an IM-marked NP may never be followed by a SLTR. SLTR agreement will always be with NP's without the IM.

Further examples involve instrumental objects:

- (4) a. ?aniŋ nafay ?u mux ?ar hara
 lsg child SLTR beat with stick
 'I will beat the/a child with the/a stick'
- b. ?aniŋ nafay ?u hart-ar mux
 lsg child SLTR stick-IM,instr beat
 'I will beat the/a child with the/a stick'

c. ʔaniŋ ʔara ʔa naʔa--r mux
 lsg stick SLTR child-IM,instr beat
 'I will beat with the/a stick the/a child'

Note that SLTR agreement is with naʔay in (4a-b), but with ʔara in (4c). Furthermore, the IM marker in these examples is phonologically similar to the instrumental preposition ʔar. It would appear that in these examples, the marker which I have labelled "IM,instr" has indeed a double function: it serves to mark the feature of instrumentality, and, as we shall see, behaves exactly like the /Ci/ IM, in that nouns marked with either of these elements will have similar accessibility restrictions.

Another prepositional expression involving the elements kitangw ... wa ale meaning 'on ... behalf of' does not show an alternation with the IM:

(5) ʔawata dasi ga mux kitangw ʔameni--r wa ale
 man girl SLTR beat on woman-DEM behalf
 'the man will beat the girl on behalf of the woman'

The examples of this section show the basic word order and SLTR agreement patterns with verbs having more than one object and the effects of a promotion rule which might loosely be called a dative movement rule, but more properly should be labelled a non-direct-object movement rule. A wider range of word-order permutations are possible in the type (a) word order examples (cf. (2a-3)) than in type (b) examples (cf. above), but this is due to the fact that type (b) structures involve SLTR agreement with objects, while type (a) never does. Type (b) examples, or sentences presumed to be derived from type (b) structures with SLTR agreement for underlying or derived objects, will be the focus of the remainder of this paper.

3. Inaccessibility Marker and Syntactic Rules

In the following examples, it will be useful to distinguish among a number of types of objects, as these are victims of various rules. The objects examined here will be semantic direct, indirect (benefactive or dative) and instrumental, as well as the prepositional

'on X's behalf' structure seen above in (5). We will attempt to have these objects become victims of the rules of PSV, TOP, WH-Q, and REL.

3.1. One-object verbs. We shall begin by using simple transitive verbs, i.e. verbs with only one object. Consider the following:

- (6) a. *hawata kuna mux ne baba*
 man PSV,SLTR beat by father
 'the man was beaten by father'
- b. *dasi kana mux ne baba*
 girl PSV,SLTR beat by father
 'the girl was beaten by father'
- (7) a. *na'ay, hawata gu mux*
 child man SLTR beat
 'the child, the man will beat'
- b. *dasi, hawata ga mux*
 girl man SLTR beat
 'the girl, the man will beat'
- (8) *?aniŋ barwito?o-r [kuŋ ta go?in] ?ana ?oh*
 lsg letter-DEM [2sg REL,SLTR write] SLTR hold
 'I held the letter which you wrote'
- (9) a. *hawata gar ?a mux*
 man WH SLTR beat
 'what did the man beat?'
- b. *hawata hee ?a mux*
 man WH SLTR beat
 'whom did the man beat?'

In examples (6-7), the SLTR's agree with the fronted noun. In (8-9), the SLTR's are invariable for these objects. The examples have been kept simple for the purposes of the discussion, but it should be pointed out that there are numerous additional complications which are beyond the scope of this paper and hence not mentioned. These do not, however, affect the point of the discussion.

3.2. More-than-one object verbs. We are now in a position to examine

more complicated examples with verbs taking more than one object. We shall be particularly interested in the behavior of those nouns suffixed with the IM in the examples below.

3.2.1. Passives. Let us first examine some PSV examples. For the underlying constructions of SUBJ-OBJ-DATIVE/BENEFACTIVE-VERB, we find that the OBJ, the Dative, or the Benefactive may be passivized:⁵

- (10) a. murufaima kuna dasi--ri hanis ne fameni
 food PSV,SLTR girl-IM give by woman
 'food was given to the/a girl by the/a woman'
- b. dasi kana murufaima---ri hanis ne fameni
 girl PSV,SLTR food-IM give by woman
 'the/a girl was given food by the/a woman'
- (11) a. murufaima kuna dasi--ri huurin ne fameni
 food PSV,SLTR girl-IM cook by woman
 'food was cooked for the/a girl by the/a woman'
- b. dasi kana murufaima---ri huurin ne fameni
 girl PSV,SLTR food--IM cook by woman
 'the/a girl was cooked food for by the/a woman'

However, if we attempt to passivize the object NP's with IM's, the sentences are ungrammatical. Consider the presumably related (10-11c) examples below:

- (10) c. *dasi-ri kana murufaima(---ri) hanis ne fameni
 girl-IM PSV,SLTR food(---IM) give by woman
 *murufaima--ri kuna dasi(---ri) hanis ne fameni
 food--IM PSV,SLTR girl(-IM) give by woman
- (11) c. *dasi--ri kana murufaima(---ri) huurin ne fameni
 girl-IM PSV,SLTR food(--IM) cook by woman
 *murufaima--ri kana dasi(--ri) huurin ne fameni
 food-IM PSV,SLTR girl(--IM) cook by woman

The parenthesized IM's are included in the above examples to show that

⁵Future researchers checking these data should be very careful to distinguish the IM morphemes from the Demonstratives mentioned in footnote 3.

ungrammaticality results whether or not the second NP is IM-marked.

Passivizing an instrumental object or the direct object is possible:

- (12) a. *ħara kana naħa--r mux ne řameni*
 stick PSV,SLTR child-IM beat by woman
 'the stick was used to beat the child by the woman'
- b. *nařay kuna ħara--r mux ne řameni*
 child PSV,SLTR stick-IM beat by woman
 'the child was beaten with a stick by a woman'

But again, if we were to attempt to passivize either object NP marked with the IM, the sentences are ungrammatical:

- (12) c. **ħara--r kana nařay(/--r) mux ne řameni*
 stick-IM PSV,SLTR child(--IM) beat by woman
- **naħa---r kuna ħara(----r) mux ne řameni*
 child-IM PSV,SLTR stick(--IM) beat by woman

In all of the preceding examples, SLTR agreement with particular derived subject NP's is correct, and cannot be the cause of ungrammaticality when it occurs. Clearly, then the presence of the IM's in (10c, 11c, 12c) is the crucial factor.

It appears that prepositional objects may not be directly passivized. Thus, from a structure like the following, the prepositional object is moved, but the result is ungrammatical:

- (13) /řameni (SUBJ)--muruřaima (OBJ)-- ħanis (V) dir (PREP) dasi /
 woman food give to girl
- > **dasi kana muruřaima(---ri) ħanis dir ----os ne řameni*
 girl PSV,SLTR food(--IM) give to(--3sgPRO) by woman

Iraqw does not allow preposition-stranding, which could be the cause of the ungrammaticality. To allow for this, a pronominal suffix *-os* is added to the preposition *dir* in parentheses, but the result was unanimously judged as extremely clumsy. We conclude then that passivization may not apply to prepositional objects, unless these objects are promoted to some other (as yet undefined) status prior to PSV.

To summarize, direct and indirect objects and instrumental objects may be passivized, but prepositional objects and IM-marked objects may not

3.2.2. Topicalization. The rule of TOP is another rule which is sensitive to the presence of an IM on the victim object NP's. This rule can move all objects *except* those marked with IM's:

- (14) a. naʃay, ʃameni guna barwitoʔo-ri hanis
 child woman SLTR letter-IM give
 'the child, the/a woman gave the/a letter to'
- b. naʃay, ʃameni barwitoʔo gana hanis dir---os
 child woman letter SLTR give to-3sgPRO
 'the child, the/a woman gave the/a letter to her'
- c. barwitoʔo, ʃameni gana ʔinos--i⁶ hanis
 letter woman SLTR 3sgPRO-IM give
 'the letter, the/a woman gave to him'
- (15) a. kuŋ, ʃameni ʔuna muruʃaima--ri huurin
 2sg,M woman SLTR food-IM cook
 'you, the/a woman cooked food for'
- b. muruʃaima, ʃameni ŋina kuŋ-gi huurin
 food woman SLTR 2sgM--IM cook
 'food, the/a woman cooked for you'
- (16) a. naʃay, ʔaniŋ ʔu ʔara-r mux
 child lsg SLTR stick-IM beat
 'the child, I will beat with the/a stick'
- b. ʔara, ʔaniŋ ʔa naʃa---r mux
 stick lsg SLTR child-IM beat
 'the stick, I will beat the/a child with'
- (17) a. dasi, ʔawata ga mux kitaŋ ʃameni wa ale
 girl man SLTR beat behalf woman behalf of
 'the girl, the/a man will beat on behalf of the/a woman'

⁶The IM-suffixed form for 'child' is in fact *naʃa-y*, which is too similar to the non-IM-suffixed form to be an effective example. Therefore I have substituted the IM-marked form for 'him', *ʔinos--i*, which very clearly alternates with the non-suffixed form *ʔinos*.

- (17) b. ζ ameni, hawata dasi ga mux kitaŋ--os wa ale
 woman man girl SLTR beat behalf-3sgPRO behalf of
 'the woman, the/a man will beat the/a girl on behalf of her'

If in examples (14-17) an IM were to appear on the topicalized NP, the sentences would be ungrammatical. Thus, it appears that all types of objects may be topicalized, but no objects with the IM may undergo this rule.

3.2.3. Relativization. Relativization, too, is sensitive to the appearance of IM's on objects. Object NP's may be relativized as in the following:

- (18) a. ζ aniŋ ζ ameni--r [na muru ζ aima-ri hanis] ζ ana ζ oh
 lsg woman-DEM [REL,SLTR food-IM give] SLTR hold
 'I held the woman whom I gave food to'
- b. ζ aniŋ muru ζ aima--r [na ζ ameni---ri hanis] ζ una ζ oh
 lsg food--DEM [REL,SLTR woman-IM give] SLTR hold
 'I held the food which I gave to the/a woman'
- (19) a. ζ aniŋ κ ara [ζ ameni ζ a garma---r mux] ζ ana ζ oh
 lsg stick [woman SLTR boy-IM beat] SLTR hold
 'I held the stick which the/a woman will beat the/a boy with'
- b. ζ aniŋ garm--o [ζ ameni ζ i κ ara---r mux] ζ una ζ oh
 lsg boy-DEM [woman SLTR stick--IM beat] SLTR hold
 'I held the boy whom the/a woman will beat with the/a stick'
- (20) ζ aniŋ ζ ameni-r [κ awata dasi ga mux kitaŋ--os wa ale]
 lsg woman-DEM [man girl.SLTR beat behalf-3sgPRO behalf of]
 ζ ana ζ oh
 SLTR hold
 'I held the woman on whose behalf the/a man will beat the/a girl'

But once again, if we were to attempt to relativize an object NP which was marked with the IM, the results would be ungrammatical. Thus, Relativization is sensitive to whether or not object NP's are suffixed by the IM.

3.2.4. WH-questions. A fourth rule which is sensitive to the presence

of IM's is WH-Q Formation.⁷ All objects can be questioned as in the following:

- (21) a. ?aniŋ gar na hawat---i hanis
 lsg WH SLTR man-IM give
 'what did I give to the/a man?'
- b. ?aniŋ hee na murufaima--ri hanis
 lsg WH SLTR food-IM give
 'whom did I give food to?'
- (22) a. ?aniŋ gar na garma---r mux
 lsg WH SLTR boy--IM beat
 'what did I beat the/a boy with?'
- b. ?aniŋ hee na hara---r mux
 lsg WH SLTR stick--IM beat
 'whom did I beat with the/a stick?'
- (23) hawata dasi ga mux kitan hee
 man girl SLTR beat behalf WH
 'the/a man will beat the/a girl on behalf of whom?'

But if we attempt to question an object NP with an IM, the results are ungrammatical. One example is given, similar to (21a-b):

- (21) c. *?aniŋ gar(---i) na hawata hanis
 lsg WH(--IM) SLTR man give
- d. *?aniŋ hee(---i) na murufaima hanis
 lsg WH(--IM) SLTR food give

3.2.5. Summary. By now the point is clear that most objects are accessible to the rules of PSV, TOP, REL, and WH-Q, whereas object NP's of any underlying relation surfacing with the IM marker must not be victims of these rules.

4. Discussion

The various types of object seem to divide themselves into

⁷WH-Q Formation also involves a relativization strategy like the following: thing/person REL SUBJ (OBJ) VERB is WH. Since this essentially duplicates the REL data, it is not included here.

several groups in Iraqw in terms of morphology and syntactic behavior. The first group, let us call them Unmarked Objects, may in type (b) structures appear directly after the subject, govern SLTR agreement (cf. sentences (3-4)), and may be victims of the syntactic rules of PSV, TOP, REL, and Wh-Q.

A second group would be Prepositional Object NP's. These may not appear directly after the subject, do not trigger SLTR agreement, and may appear after the verb. These elements may be victims of all of the syntactic rules described above except PSV.

The third group of objects are those marked with IM's. Recall that we are restricting our discussion to type (b) structures. IM-marked Objects may not appear directly after the subject, do not and must not trigger SLTR agreement, and may not be victims of any of the syntactic rules discussed above.

Thus, we have a sliding scale of object types, which we may summarize as in the following table:

	after subject	SLTR agreement	victim of	
			PSV	TOP,REL,WH-Q
Unmarked	yes	yes	yes	yes
Prepositional	no	no	no	yes
IM-Suffixed	no	no	no	no

I would now like to discuss an analysis of this data with an approach based on Relational Grammar. It has long been noted that relational (syntactic) promotion, accessibility to syntactic rules, and focus are inter-related features, and the correlation has been reasonably well established. What is being proposed here for Iraqw is that there is a particular morpheme, the IM suffix, which is transformationally attached to those object NP's which have been relationally demoted.⁸ Coupled with relational demotion is syntactic inaccessibility for that relation,

⁸Cf. Dalgish [1976] and Dalgish and Sheintuch [1977] for a discussion of transformational verbal marking when Locative Objects have gone "up" the Relational Hierarchy.

and a corresponding inability to focus on that item. Within our hierarchy of Object types, Unmarked Objects are at the top of the scale, IM-marked Objects at the bottom, and Prepositional Objects somewhere in between.

Let us consider some concrete examples within this Relational-Demotional approach. Assuming that alternations of object types as in (3a-c) and (4a-c) are related, we can characterize these relations in terms of Relational promotion and demotion. Consider examples in which certain Prepositional Objects (those with *dir* and *ʔar* as the prepositions) may become Unmarked Objects:

- (3) a. ʔaniŋ barwitoʔo ʔa hanis dir ʔawata
 lsg letter SLTR give to man
 'I will give the/a letter to the/a man'
- (3) c. ʔaniŋ ʔawata ʔu barwitoʔo--ri hanis
 lsg man SLTR letter--IM give
 'I will give the/a man the/a letter'

In (3c), the Unmarked Object *ʔawata*, derived from the Prepositional Object *dir ʔawata* in (3a), has been promoted and appears after the subject, governs SLTR agreement, and may be the victim of PSV, TOP, REL, and WH-Q. These are properties that as a Prepositional Object it did not possess. The promotion of the Prepositional Object to Unmarked Object status will result in the demotion by usurpation of the previous Unmarked Object, in these cases, *barwitoʔo*, which then becomes transformationally suffixed by the IM. As a demoted NP, it is less accessible to syntactic rules and consequently "out of focus".

A case in which only demotion takes place is illustrated by the following sentences:

- (3) a. ʔaniŋ barwitoʔo ʔa hanis dir ʔawata
 lsg letter SLTR give to man
 'I will give the/a letter to the/a man'
- (3) b. ʔaniŋ barwitoʔo ʔa ʔawat---i hanis
 lsg letter SLTR man--IM give
 'I will give the/a letter to the/a man'

In (3a), the Prepositional Object *hawata* may be Topicalized, Relativized, WH-Questioned, but may not be Passivized or trigger SLTR agreement. But if *hawata* is moved to the left of the verb, it loses its Prepositional Object status, and may not be the victim of any of these syntactic processes. The IM-morpheme, it is claimed, signals this Relational demotion. Examples like these show that it is possible for Relational demotion to take place without necessarily involving usurpation in promotion processes (cf. Dalgish [1977] for evidence from Dho-Luo indicating essentially similar findings).

To summarize, then, the relational demotion undergone by either the (underlyingly) Unmarked Object or the Prepositional Object NP is signalled by the appearance of the IM morpheme. This analysis can easily be extended to other examples in this paper. This Relational account of the syntax of object NP's in Iraqw allows us to state quite simply the conditions under which object NP's are suffixed by the IM morpheme, namely, whenever an object undergoes a Relational demotion. We may view the restricted syntactic behavior (inaccessibility) of such suffixed NP's as a consequence of this demotion.

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PAPERS FROM THE EIGHTH
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GRAMMATICAL TONE NEUTRALIZATION IN KINYARWANDA*

Alexandre Kimenyi
California State University, Sacramento

1. Introduction

The purpose of this paper is to show an area of grammar that the existing model of generative grammar cannot account for without recourse to complicated ad hoc rules. The surface phonetic form of the tones is unpredictable, and furthermore an adequate representation of the underlying structure of these tones seems difficult to find. The unpredictability of the output structure is due to the ambivalent nature of tone, which in Kinyarwanda and in other Bantu languages as well, can be (a) a feature on the syllable as well as (b) a syntactic morpheme.

To illustrate this, I will limit the analysis to the verb morphology. Kinyarwanda, like other Bantu languages, is agglutinative. For instance, tense markers, subject pronouns (agreement), object pronouns (clitics), case markers (benefactive, instrumental, locative...), voice (passive, middle), and aspect are morphemes affixed to the verb as illustrated in (1):

- 1) Baârabíkûbitirwaga < ba¹-aara-bi-kubit-ir²- w-aga
'They used to be beaten for that.' they-past-it-beat -ben-pass-asp

This language has two phonological tones, high (H) and low (L). Vowels are either short (V) or long (VV). Phonetically, short vowels appear as either H (v̂), L (v̇) or F (=falling)(v̂). Long vowels surface as either LL (v̂v̂); HH (v̂v̂); LH (v̂v̂); HL (v̂v̂) or LF (v̂v̂). Low tone will not be marked again in this paper. For a detailed discussion, see Kimenyi [1976]. In the penultimate position of the infinitival form, the sequence HH is not attested because of the existence of a tone anticipation rule in this lan-

*I have received valuable comments on the early version of this paper from Baruch Elimelech and Larry Hyman.

¹The vowel a is always deleted if it precedes a morpheme beginning with another vowel.

²A consonant is always inserted between a consonant and a glide: the epenthetic consonant takes the articulatory features of the glide and agrees in voicing, nasality and spirantization with the preceding consonant (for detail, see Kimenyi [1977a]).

guage. The final vowel -a, which comes after the verb stem, always carries L tone. The F tone is underlyingly H, and all Hs derive from the next syllable on the right. A F does not surface on the onset of a long vowel, nor in word-initial position. Anticipation is blocked if the H is on the coda of a long vowel. These rules are formalized in (2) and illustrated in (3):

- 2) a. $\acute{v} \rightarrow \hat{v}$
 condition: \acute{v} is not $\left\{ \begin{array}{l} \# \acute{v} \\ \underline{v} \end{array} \right\}$ b. $\hat{v} \rightarrow \acute{v} / \underline{\quad} CV$
 condition: $\sim v \acute{v}$
- 3)
- | | | |
|---------------|-----------------------|------------------|
| /umu + gabo/ | umugabo | 'man' |
| /iki + gega/ | ikigega | 'storehouse' |
| /umu + gore/ | umugóré | 'woman, wife' |
| /aka + masú/ | akamájú | 'trap' |
| /ú + no/ | únô | 'this one' |
| /bá + no/ | bâno | 'these ones' |
| /umu + áana/ | úmŋáana ² | 'child' |
| /uku + éezi/ | úkwéezi | 'moon, month' |
| /umu + ééndá/ | úmŋéénda | 'debt' |
| /iki + áapá/ | íkáápa ¹ | 'traffic signal' |
| /umu + aámi/ | umŋaámi ² | 'king' |
| /umu + eénge/ | umŋeénge ² | 'hole' |

In the remainder of the paper we will see instances in which the rules given in (2) apply. But in many more cases, it will be shown that the phonetic tones of the verb forms are not predictable, since the underlying tones of the same morpheme seem to differ in some tenses. To make the presentation clear and convincing, I will give examples of monosyllabic verbs since in this language each infinitival verb form can have only one lexical high tone, no matter how many syllables it happens to have--the choice of monosyllabic examples does not mitigate the force of our argument. Since vowel length is contrastive, the monosyllabic verbs under investigation are either of the shape -CVC- or -CVVC-. Therefore we may expect two types of tones to occur in each: -CVC stems will appear as either -CVC- or -CVC-, whereas the phonological tone of -CVVC- is -CVVC- or -CVVC-. The verb -kór- 'work, do', will be used for the -CVC- stem, -kin- 'play' for -CVC-, -kúund- 'like, love' for -CVVC- and -geend- 'go, leave' for -CVVC-.

As indicated in (1), the finite verb has as obligatory morphemes the subject agreement, the tense and the aspect markers. Optional morphemes that appear on the finite verb are (i) ni- and the negative marker for independent clauses, nti-; (ii) the negative marker for subordinate clauses -ta-, which comes after the subject agreement; (iii) the object clitics, of which there can be a maximum of four, appearing between the tense marker and the verb stem; (iv) the morpheme -na- 'also', which appears between the tense marker and the object clitics; (v) the extensions which come after the verb stem; and (vi) the locative suffixes, just after the aspect marker. The order of these morphemes is given below:

- 4) ({^{neg1} }) -Subj.- (neg₂) -Tense- (na) - (Obj.) -Verb- (suff.) -asp- (loc.)
 ni Agr. Cl. Stem

Neg₁ and neg₂ are exclusive. The aspect markers are -a(ga) imperfective, and¹ -(v)ye² perfective. The locative morphemes are -mó and -hó. The morphemes that appear in the tense slot are the following:

5)	-ra-	present/near future	-raka-	hortative ₁
	-zaa-	future	-ooka-	hortative ₂
	-aa ₁ -	near past	-aa ₂ -	conditional ₁
	-aara-	remote past	-ii-	negative imperative
	-rakʷaa-	still	-∅ ₁ -	habitual
	-ka-	narrative/consecutive	-∅ ₂ -	participial
			-aa ₃ -	conditional ₂

2. Tone Realization of Simple Tenses

In Table 1, the uses of these tenses with the four types of verbs are illustrated. Only one subject agreement marker, ba-, will be used in the paper for clarity of exposition. On the right are given the phonetic realizations.

These tenses will be grouped into different classes because of the effect they produce on the underlying tones of the verb stems. The tenses that keep the lexical tones of the verb and let the tone rules given in (2) apply, such as the -ra-, -aa-, -ka-, and -rakʷaa- tenses, will be called the lexical tone keeping tenses; the others will be labelled the lexical tone neutralizing tenses because they seem to give the same tone to all verbs, regardless of their underlying tones.

Group two tenses are in turn subclassified into 4 categories: (i) tenses that lower the verb stem tone (e.g. -zaa-, -raka-, and -∅-, the future, hortative and habitual formatives); (ii) tenses that lower the stem tone but put a H on the syllable preceding it (e.g. -∅- and -ooka-, the participial and hortative markers); (iii) tenses that put a H on the stem, namely remote past -aara-; and finally (iv) the tenses that put H on the last syllable of the finite verb: -aa- and -ii-, from the if clause of conditionals and negative imperatives respectively.

The imperative tones are classified in group 2(i) also, because they lower the whole verb:

6)	<u>Imperative</u>	<u>Verb Stem</u>	<u>asp</u>	<u>Phonetic realization</u>	<u>Gloss</u>
		-kór-	-a	kora	'work'
		-kin-	-a	kina	'play'
		-kúund-	-a	kuunda	'like'
		-geend-	-a	geenda	'go'

The infinitive is classified among the lexical tone keeping morphemes:

Table 1. Tone realization of simple tenses, cont.

k.	ba-aara	-work-ye -play- -like- they-rm.past-go -perfect	H baârákôze L baârákîŋne HL baârákúunze LL baârágéenze	m.	ba-ii	-work-a -play- -like- they-neg.imp.-go -imperf.	H biikórá L biikíŋná HL biikuúndâ LL biigeéndâ
Glosses:							
l.	ba-aa	-work-a -play- -like- they-cond. -go -imperf.	H baakórá L baakíŋná HL baakuúndâ LL baageéndâ	a.	'they V'	f.	'they will V'
				b.	'they V-ed'	g.	'may they V'
				c.	'and then they V-ed'	h.	'they V habitually'
				d.	'they are still V-ing'	i.	'them V-ing'
				e.	'they would V'	j.	'may they V'
				k.	=b. l. 'if they V-ed'	m.	'they shouldn't V'

Table 2. Doubt

a.	- ba-ra ⁵	-work-a -play- -like- doubt-they-present-go -imperf.	bâkora bâkina bâkuunda bâgeenda	d.	- ba-aa ₁	-work-ye -play- -like- doubt-they-nr.past-go -perfect	bâákôze bâakinpe bâákúunze bâageenze
b.	- ba-∅ ₁	-work-a -play- -like- doubt-they-habit. -go -imperf.	bâkora bâkina bâkuunda bâgeenda	e.	- ba-aara	-work-ye -play- -like- doubt-they-rem.pst-go -perfect	bâarákôze bâarákîŋne bâarákúunze bâarágéenze
c.	- ba-zaa ⁶	-work-a -play- -like- doubt-they-future -go -imperf.	bâzaakora bâzaakina bâzaakuunda bâzaageenda	Glosses:			
				a.	'are they V-ing?'	d.	'did they V?'
				b.	'do they V?'	e.	'did they V?'
				c.	'will they V?'		

⁶There is another way to express this, namely:

bázáá{^{kôra}
kúunda} 'will they {^{work}
like}?'

bázáa{^{kina}
geenda} 'will they {^{play}
go}?'

7) <u>Infinitive</u>	<u>Verb Stem</u>	<u>asp</u>	<u>Phonetic realization</u>
ku-	-kór-	-a	gúkòra 'to work'
	-kin-		gukina 'to play'
	-kúund		gúkúunda 'to like'
	-geend-		kugeenda 'to go'

How can we account for the tone rules of these tenses in a unified way? The best way to do this is to posit two types of tones, T_1 and T_2 . T_1 is the feature on the syllable or the lexical tone, whereas T_2 is the morphological tone. As has been observed elsewhere [Kimenyi 1976²], lexical tones are characterized by a binary feature, \pm High, since L tones don't play any role in the tone rule formulation of lexical tones. Note, however, that in the case of morphological tones, low tones are very significant. For this reason, morphological tones, T_2 , will be classified into two types of tones, αT_2 and βT_2 . αT_2 tones are the ones that are toneless and therefore let the tone anticipation rule apply if its structural description is met. βT_2 tones are those morphological tones that neutralize the lexical tones. αT_2 are thus equivalent to lexical L tones, since they allow the tone anticipation rule to apply. βT_2 tones are also realized as either L or H. In order to distinguish them from lexical tones, they will be marked by a prime marker (').

8) $\beta T_2 \rightarrow \left\{ \begin{array}{l} L' \\ H' \end{array} \right\}$

Since a lexical H tone is neutralized before a βT_2 tone whether it is L' or H' , and since as will be shown, the tone anticipation applies among βT_2 tones, we can propose the following tone hierarchy (TH):

9) TH: $\left\{ \begin{array}{l} L \\ \alpha T_2 \end{array} \right\} < H < \left\{ \begin{array}{l} L' \\ H' \end{array} \right\}$ where the sign $<$ means greater than or takes precedence

The tone anticipation rule has to be reformulated as follows:

10) a. $\left\{ \begin{array}{l} L \\ \alpha T_2 \end{array} \right\} \rightarrow H / \underline{\quad} \left\{ \begin{array}{l} H \\ H' \end{array} \right\}$ b. $H \rightarrow L / \left\{ \begin{array}{l} L' \\ H' \end{array} \right\}$

In other words, the tone anticipation applies the way it was formulated in (2) if the morphological tone before a lexical H is toneless. The lexical tones are lowered before or after morphological tones, L' or H' . The rules given in (10) are indeed responsible for the 4 types of tone realization observed in Table 1. The -ra-, -rak'aa-, -ka-, and the -aa- forms are derived by rule 10a. The f, g and h tenses in Table 1 are derived by R.10b, in which case these tenses are supposed to have in the underlying representation a L. The remaining 3 types of tone realization in Table 1--types i-j; k; and l-m--are derived by both R.10a and R.10b. Lexical tone in i-j is neutralized after the H morphological tone. Participial tone can be reconstructed as H in the syllable preceding the verb stem and the underlying representation of the hortative is -ooká-. The remote past is represented by -aára- plus a H on the verb stem. In the case of the l and m forms, the H is on the last syllable but realized on the stem per R10a and R10b.

3. Complex tenses

The tenses given in (5) can be combined with some other tense morphemes such as subjunctive, doubt mood, conditional, relative and negative, and thus result in more complex tenses. It is precisely in these instances that it will be illustrated that their tonal output structure is not derived but memorized, since there doesn't seem to be any general way their surface forms can be accounted for in the present generative framework. Tenses that appear in the subjunctive are given first, then come doubt tenses, relative and conditional tenses. The section concludes with negatives.

3.1 Subjunctive. Only three tenses, present, near future and distant future, (-ra-⁵, -ra-, -zaa-) can appear in this mood.

11) a.	ba-ra ⁵	-work-e	H	bakóré	'they should V'
	they-present-play-subj.		L	bakínê	
		-like-	HL	bakuúndê	
		-go -	LL	bageéndê	
b.	-ra	-work-e	H	barakore	'they should V'
	-nr.fut.-play-subj.		L	barakine	
		-like-	HL	barakuunde	
		-go -	LL	barageende	
c.	-zaa	-work-e	H	bázáakóré	'they should V'
	-rm.fut.-play-subj.		L	bázáakínê	
		-like-	HL	bázáakuúndê	
		-go -	LL	bázáageéndê	

How can we derive the tones in the tenses above? If we posit the subjunctive tone as a final H, we will get the phonetic realization by applying the tone neutralization rule in (10) and the tone anticipation rule in (2). Note, however, that this rule, even if it gives the right result for (11b), is not general, since the data in (11b) and (11c) are not obviously derived by these rules. Each tense seems to have its own subjunctive tone, thus the near future (11b) would have a final L in order to get the right results. The distant future would have two Hs, namely the final H and the H on the tense marker. Clearly, some generalization is being missed here.

3.2 Doubt. As the name indicates, doubt mood is used to show uncertainty. The tenses that appear in this mood are present, habitual, future, and both recent and remote pasts (-ra-⁵, Ø, -zaa-, -aa-, -aara-). Since this mood is solely indicated by tone, it will be placed before the subject agreement. Table 2, which follows Table 1, p. , shows the Doubt mood forms.

⁵Note that in all these cases, the morpheme -ra- is deleted: but this shows that positing such underlying representation is already the incorrect approach.

The underlying doubt tone can be posited as H on the first vowel of the finite verb. The rules that we have formulated earlier give us the right phonetic output for at least the first three tenses. The lexical tones are neutralized as predicted by rule (10) and the doubt tone falls, as dictated by rule (2a). The neutralization rule doesn't apply to the recent past (Table 2, form d), however, since the lexical tones are retained. Note also that in the remote past (form e) an extra H is added on the verb stem. It is clear that the phonetic output of many tenses cannot be predicted all the time.

3.3 Relative. Verbs in relative clauses are marked by a H. The same tone is shared by verbs in "that" clauses. Tenses that appear in relative clauses are: present, habitual, future, recent and remote pasts, conditional and "still" (-ra-, -Ø₁-, -zaa-, -aa₁-, -aara-, -aa₂-, -rakYaa-). These forms are tabulated in Table 3.

In the the a, b, d, f & g forms, the relative morpheme is a H marked on the last syllable of the finite verb. The phonetic tones in these tenses are derived by the rules that we have posited. Note, however, that the relative marker in the future and remote past is marked differently. In the future tense, this tone is marked on the onset of the tense marker. We observe also that in this instance, the lexical tones are not neutralized. In the remote past, the relative tone is marked on the coda of the tense marker. This is a problem for a theory that would posit the same underlying tone to all relative tenses.

3.4 Realis conditional. This mood is marked by the morpheme ni- (probably from the copula ni) which, like the negative marker nti-, precedes subject agreement. It is used in two tenses, present and future (-ra-, -zaa-).

12) a.	ni- ba-ra ⁵	-work-a	H	nîbakórá	'if they V'
		-play-	L	nîbakínâ	
		-like-	HL	nîbakuúndâ	
	rc-3pp-present-go	-imp.	LL	nîbageéndâ	
b.	ni- ba-zaa	-work-a	H	nibázáákôra	'if they will V'
		-play-	L	nibázáakina	
		-like-	HL	nibázáákúunda	
	rc-3pp-future	-go -imp.	LL	nibázáageenda	

As we can see, this mood neutralizes the lexical tones and bears different tones in the two tenses. In the a form, the first and last syllables of the verb have a H; whereas in the b form, the morphological tone is marked as a H on the tense morpheme. In the latter tense, tone neutralization doesn't take place as in the former.

3.5 Tenses that take the negative nti-. In the independent clause the negative morpheme is nti-. In Table 4 we find the allowable tenses after this negator: present, recent and remote pasts, future, conditional:then

clause, consecutive, subjunctive and "not yet" forms (-ra-, -aa-₁, -aara-, -zaa-, -aa-_{2,3}, -ka-, -e, -raa-).

As we can see, the negative tone is marked differently depending on the tense. In some tenses, it is marked by a complete lowering of the finite verb, as in the Table 5 d & g forms. In the present, the negative tone is marked as H on the last syllable of the verb. In the future, i, it is marked by a H on the tense marker. The same tone is marked on the "not yet", or j form. Notice that in both i and j the tense markers behave like toneless morphemes (αT_2) since tone neutralization does not take place, the lexical tones remain and the tone anticipation rule is not blocked. In the h form, negation is tonally marked on the H subject agreement. In g, negation is realized as H on the negating morpheme. In the remote past, e, negation is tonally marked on the coda of the tense marker. Obviously, the same negative morpheme cannot be posited for all tenses.

3.6 Tenses that take the -ta- negator. As mentioned earlier, the negator -ta- is used in subordinate clauses: doubt mood, "that" clauses, relative clauses, conditionals, participials, gerunds and relatives. We see these forms displayed in Table 5.

The gerund is always preceded by the copula -ri. It takes the noun class marker bu- (14). It ends with the subjunctive marker -e and has future reference. Gerunds and infinitives negated are demonstrated in Table 6.

In many tenses, the negative marker can be reconstructed as a toneless morpheme, since the verbs that have it are identical to their positive counterparts. Compare the conditional forms in Table 1, 1, with Table 5 b and d/7. Note that in Table 6, the main verb in the gerundive also has the same tone pattern; other, non-conditional, forms in Table 5 with this tone pattern are: d/1,2, and 4. The affirmative gerund is part of this pattern: bukó^hê, bukí^hê, bukuú^hndê, bugeé^hndê. In Table 5 a and c/1, negation is marked on the last syllable of the verb stem. We note also that the tones of the tense marker also appear in 5 a and c/1--compare Table 1, i, and Table 2, a. In d/6 of Table 5, the negative marker produces a lowering on the verb. If the negative infinitive's tones are derived by the tone neutralization rule, the anticipation and the falling rules, then the underlying tones would be three Hs, one on the aspect marker, another on the verb stem and the third on the negator.

4. Conclusion

This paper has shown that in order to capture what is going on in the tones of the simple tenses, one has to recognize the following:

i. Some grammatical tones are considered toneless, which means that phonologically, they behave like lexical Ls and thus allow application of the tone anticipation rule.

- ii. Lexical tones are neutralized before grammatical tones so that a high tone verb stem and a low tone verb stem are realized in the same way.
- iii. There exists a tone hierarchy; lexical tones neutralize before grammatical tones and some grammatical tones neutralize before other grammatical tones.

Although the phonetic tones of simple tenses can be predicted, it has been observed that they cannot be generated in the usual way. This is due to the fact that we cannot tell how the underlying representations of these tenses should be formulated. The same morpheme (relative, negative, doubt ...) has different underlying tones depending on tense. Even where the underlying tone representation is straightforward, it is not easy to generate the tones since one would have to tell beforehand which tones were going to neutralize before the others. This observation makes it unlikely that these tones are derived.

I conclude, therefore, that all these complex tenses are memorized by native speakers rather than generated. The grammar that I am proposing is of course very complex and misses some important generalizations; but then there is no proof that simpler grammars are the psychologically real ones. The phenomenon that we are facing is indeed not unnatural. We are dealing with morphological rules, thus some parts of the grammar, namely morphology and the lexicon, have to be memorized, whereas phonological and syntactic rules are generated.

The irregularity of tone behaviour in this language would have the same explanation as that of rule morphologization in general. Usually phonological rules apply mechanically if their structural descriptions are met. Phonological rules become morphologized, however, if they destroy the paradigm or render opaque the grammatical function of the morpheme [Kimenyi, in preparation]. That is, languages have strategies for keeping the semantic information unaffected. We have noted that lexical tones are neutralized before morphological tones. This is so because morphology is very crucial in communicating both semantic and grammatical information.

There is a possibility also that some types of information might be more important than other types. This would explain the neutralization, in certain complex tenses, of some grammatical tones before others. The combination of tenses, in this instance, have been lexicalized, so to speak, and constitute for the native speaker one "psychological" tense. There is in fact some morphological evidence to support this hypothesis. First, have observed that not only tones, but also segmental morphemes, neutralize. Thus the present and the habitual come out the same in relative and negative forms (Tables 3 & 4, forms a & b).

In some cases the tense markers of negative verbs are different from their affirmative counterparts. For instance, the present marker is -ra- in the affirmative but -∅- in the negative; the "still" tense is realized as -rak'vaa- in the affirmative but -ki- in the negative. The hortative morpheme is -raka- in the affirmative, but -ka- + subjunctive ending

Table 3. Relative

a.	- ba-ra ⁵	-work-a -play- -like-	bakórá bakínâ bakuúndâ bageéndâ	H L HL LL	e.	- ba-aara ⁵	-work-ye -play- -like-	baâkoze baâkinne baâkuunze baâgeenze
	rel-3pp-present-go	-imperf.				rel-3pp-rm.past-go	-perfect	
b.	- ba-∅ ₁	-work-a -play- -like-	bakórá bakínâ bakuúndâ bageéndâ	H L HL LL	f.	- ba-rak ^y aa ⁵	-work-a -play- -like-	bagikórá ³ bagikínâ bagikuúndâ bakigeéndâ
	rel-3pp-habit.	-go -imperf.				rel-3pp-still	-go -imperf.	
c.	- ba-zaa	-work-a -play- -like-	bázáákôra bázáakina bázáákúunda bázáageenda	H L HL LL	g.	- ba-aa ₂	-work-a -play- -like-	baakórá baakínâ baakuúndâ baageéndâ
	rel-3pp-future	-go -imperf.				rel-3pp-cond.	-go -imperf.	
d.	- ba-aa ₁	-work-ye -play- -like-	baakózé baakínne baakuúnzê baageénzê	H L HL LL	<u>Glosses:</u> a. 'who V' b.(=a) c. 'who will V' d. 'who V-ed' e.(= d) f. 'who are still V-ing' g. 'who would V'			
	rel-3pp-nr.past-go	-perfect						

Table 4. Tenses that take the negative nti-

a.	nti- ba-ra ⁵	-work-a -play- -like-	H L HL LL	nhibakórá nhibakínâ nhibakuúndâ nhibageéndâ	d.	nti- ba-aa ₁	-work-ye -play- -like-	nhibakoze nhibakinne nhibakuunze nhibaageenze
	neg-3pp-present-go	-imperf.				neg-3pp-nr.past-go	-perf.	
b.	nti- ba-∅ ₁	-work-a -play- -like-	H L HL LL	nhibakórá nhibakínâ nhibakuúndâ nhibageéndâ	e.	nti- ba-aara ⁵	-work-ye -play- -like-	nhibaâkoze nhibaâkinne nhibaâkuunze nhibaâgeenze
	neg-3pp-habit.	-go -imperf.				neg-3pp-rm.past-go	-perf.	
c.	nti- ba-zaa	-work-a -play- -like-	H L HL LL	nhibázáákôra nhibázáakina nhibázáákúunda nhibázáageenda	f.	nti- ba-raka ⁵	-work-a -play- -like-	nhibâgakore ³ nhibâgakinne nhibâgakuunze nhibâkageende
	neg-3pp-future	-go -imperf.				neg-3pp-hort. ₁	-go -imp.	

Table 4. Tenses that take the negative nti-, cont.

g.	nti- ba-rak ⁵ aa ⁵ -work-a	H	nhibagikora ³	i.	nti- ba-zaa -work-e	H	nhíbâzaakore
	-play-	L	nhibagikina		-play-	L	nhíbâzaakine
	-like-	HL	nhibagikuunda		-like-	HL	nhíbâzaakuunde
	neg-3pp-still -go -imp.	LL	nhibakigeenda		neg-3pp-future -go -subj.	LL	nhíbâzaageende
h.	nti- ba-ra ⁵ -work-e	H	nhíbâkore	j.	nti- ba-raa -work-a	H	nhibáráákora
	-play-	L	nhíbâkine		-play-	L	nhibáráákina
	-like-	HL	nhíbâkuunde		-like-	HL	nhibáráákúunda
	neg-3pp-nr.fut.-go -subj.	LL	nhíbâgeende		neg-3pp-not yet-go -imp.	LL	nhibáráageenda

Glosses: a = b 'they don't V' c. 'they won't V' | g. 'they don't V anymore' | j. 'they haven't
d = e 'they didn't V' f. 'may they not V' | h = i. 'they shouldn't V' | V-ed yet'

Table 5. Tenses that take the -ta- morpheme

a.	- ba-ta -∅ ₂ -work-a	H	bâdakórá ³	c/3	- ba- ta-aa ₁ -work-ye	bâtaakoze
	-play-	L	bâdakiñâ		-play-	bâtaakinñe
	-like-	HL	bâdakuúndâ		-like-	bâtaakuunze
	(part)-3pp-neg-partic.-go -imp.	LL	bâtageéndâ		(dbt)-3pp-neg-nr.past-go -perf.	bâtaageenze
b.	- ba- ta-aa -work-a	H	bataakórá	c/4	- ba- ta-aara -work-ye	bâtaarákôze
	-play-	L	bataakinâ		-play-	bâtaarákíñe
	-like-	HL	bataakuúndâ		-like-	bâtaarákúunze
	(cond)-3pp-neg-cond. -go -imp.	LL	bataageéndâ		(dbt)-3pp-neg-rm.past-go -perf.	bâtaarágeenze
c/1	- ba- ta-ra ⁵ -work-a	H	bâdakórá ³	d/1	- ba- ta-ra ⁵ -work-a	badakórá ³
	-play-	L	bâdakiñâ		-play-	badakinâ
	-like-	HL	bâdakuúndâ		-like-	badakuúndâ
	doubt-3pp-neg-present-go -imp.	LL	bâtageéndâ		(rel)-3pp-neg-present-go -imp.	batageéndâ
c/2	- ba- ta-zaa -work-a	H	bâtázáákôra	d/2	- ba- ta-∅ ₁ -work-a	badakórá ³
	-play-	L	bâtázáákina		-play-	badakinâ
	-like-	HL	bâtázáákúunda		-like-	badakuúndâ
	doubt-3pp-neg-future -go -imp.	LL	bâtázáageenda		(rel)-3pp-neg-habit. -go -imp.	batageéndâ

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Table 5. Tenses that take the -ta- morpheme, cont.			
d/3	- ba- ta-zaa	-work-a -play- -like-	H batázáákòrà L batázáákina HL batázáákúunda LL batázáageenda
	(rel)-3pp-neg-future	-go -imp.	
d/4	- ba- ta-aa ₁	-work-ye -play- -like-	H bataakózê L bataakínê HL bataakuúnzê LL bataageénzê
	(rel)-3pp-neg-nr.past-go	-perf.	
d/5	- ba- ta-aara ⁵	-work-ye -play- -like-	H bataâkoze L bataâkinpe HL bataâkuunze LL bataâgeenze
	(rel)-3pp-neg-rm.past-go	-perf.	
d/6	- ba- ta-rak ⁵ yaa	-work-a -play- -like-	
	(rel)-3pp-neg-still	-go -imp.	
d/7	- ba- ta-aa	-work-a -play- -like-	bataakórâ bataakínâ bataakuúndâ bataageéndâ
	(rel)-3pp-neg-cond.	-go -imp.	
<u>Glosses:</u>			
	a.	'them without V-ing'	
	b.	'if they don't V'	
	c.	1. 'aren't they V-ing?'	
		2. 'will they V?'	
		3 = 4. 'didn't they V?'	
	d.	1 = 2 = 3 'who don't V'	
		4 = 5 'who didn't V'	
		6. 'who don't V anymore'	
		7. 'who wouldn't V'	

Table 6. More forms that take the -ta- morpheme

a.	ba- ri # bu- ta-work-e	H bári. budakóré ^{3,7} L bári budakínê HL bári budakuúndê LL bári butageéndê
	3pp-cop # 14-neg-go	-subj.
	Gloss: 'they won't V'	
b.	ku- ta-work-a	H kúdákórâ L kúdákínâ HL kúdakuúndâ LL kútágeéndâ
	inf.-neg-go	-imp.
	Gloss: 'not to V'	

⁷If the main verb has an auxiliary, the negative marker can be marked either on the auxiliary or on the main verb. The other way to negate would be as follows:

kóré
 kínê
 nhibári bu{ kuúndê } 'they don't V'
 geéndê

on the verb in the negative. The remote past morpheme in the affirmative is -aara- but -aa- in the negative. This suggests, I believe, that affirmative and negative tenses are independent of each other, not derived from the same sources.

It seems also that the tenses in independent clauses are independent of those in subordinate clauses. They are, as in the case of affirmative versus negative, marked differently in some cases. We have noted already that they have different negative markers, for instance, -ta- for subordinate, but nti- for independent, clauses. As in negative verbs, the morpheme -ra- is always deleted, the "still" tense is realized as -ki- instead of -rak'vaa-, and the remote past morpheme is -aa- instead of -aara-. A grammar that would posit the same underlying structures, to both affirmative and negative tenses, on the one hand, subordinate and independent forms on the other hand, would not only be unmotivated but also unnatural.

If I am correct in the explanation given here for grammatical tone neutralization and its lexicalization, future research should be devoted to grammatical tone hierarchies in order to predict the direction of tone change in the Bantu verb system.

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A DIACHRONIC-TONOLOGICAL ANALYSIS OF CERTAIN
RANK SHIFTED VERBAL STRUCTURES IN NORTHERN SOTHO¹

Daan Lombard
University of South Africa

1. Introduction

While analysing the surface tone of certain verbal constructions in Northern Sotho some time ago, I ran into the difficulty that certain structures simply could not be analysed in terms of the tone rules which seemed to work for other aspects of the language.

The structures I am referring to include the so-called "future tense" as in:

(1) "Future"

bá tló e tífja
they fut. it bring 'they will bring it'

and the so-called "long present tense" as in:

(2) "Present"

bá á e tífja
they pres. it bring 'they are bringing it'

Some light was thrown on this problem by Talmy Givón, when he made the statement that: "...the modality prefixes...and the verb-deriving suffixes ...have historically arisen from main verbs dominating sentential complements" [Givón 1971:394].

2. Underlying Tone and Some Tone Rules

The starting-point for determining the tone rules² is the underlying tonal representation. If a syllable is realized as /+H/ in an environment of /-H/ syllables, then that /+H/ syllable is taken to be underlying /+H/.

¹I am greatly indebted to Profs. J. A. Louw and Fritz Ponelis, and Mr. Anthony Davey, for their valuable suggestions and criticism on the paper that preceded this article.

²A more complete exposition of the underlying tone and the tone rules of Northern Sotho (Pedi) can be found in Lombard [1976].

In terms of these principles, the following has been found:

a. The verb stem $-tli\dot{f}a$ 'bring' has an underlying $/-H/-H/$ tone sequence and therefore belongs to the low class of stems, e.g.:

(3) go $tli\dot{f}a$ 'to bring'

b. The infinitive prefix $go-$ 'to' is underlying $/-H/$. (cf. (3))

c. The object agreement morpheme $-é-$ 'it' is underlying $/+H/$, e.g.:

(4) go \acute{e} $tli\dot{f}a$
to it bring 'to bring it'

Furthermore, it is evident from this example that the underlying $/-H/$ first syllable of the verb stem is realized as $[+H]$ on the surface. This can only be ascribed to the influence of the preceding $/+H/$ syllable, to which it is assimilated. Assimilation (TA) may be schematized as:

(5) TA: $/-H/ \rightarrow [+H] / [+H] _ / -H/$

It should be pointed out that the word-final syllable at the end of an utterance is never assimilated to a preceding $/+H/$ syllable.

d. The future tense marker $-tlo-$ 'shall, will' and the present tense marker $-a-$ are both underlying $/-H/$:

(6) ke tlo $tli\dot{f}a$ 'I shall bring'

(7) ke a $tli\dot{f}a$
I pres. bring 'I am bringing'

e. The subject agreement morpheme $b\acute{a}-$ 'they' is underlying $/+H/$ as in:

(8) $b\acute{a}$ \acute{a} $tli\dot{f}a$
they pres. bring 'they are bringing'

Again the first syllable following $b\acute{a}-$ is assimilated to $[+H]$.

3. The Problem

The following underlying tonal representations of the two structures under discussion may be deduced from the foregoing:

(9) $*b\acute{a}$ tlo \acute{e} $tli\dot{f}a$ and $*b\acute{a}$ a \acute{e} $tli\dot{f}a$

The first syllable of the verb stem is assimilated to $[+H]$:

(10) $*b\acute{a}$ tlo \acute{e} $tli\dot{f}a$ and $*b\acute{a}$ a \acute{e} $tli\dot{f}a$ (TA, cf. (5))

On the surface $-tlo-$ and $-a-$ are realized as $[+H]$, but in this environment, in terms of the rules stated, assimilation cannot operate to change them to $[+H]$. On the other hand, the object agreement morpheme $-é-$ cannot be changed to $[-H]$ on the surface in terms of any known rule. But it is realized with a low pitch.

A possible explanation for these seemingly unaccountable surface pitch realizations is based on the hypothesis that at some earlier stage in their

historical development, these constructions must have been more complex.

4. The Future Tense

As far as the future tense is concerned, it has been convincingly argued by Ponelis [1975], working along the lines of Givón [1971; 1973], that the auxiliary verb -t|o is the result of rank shifting (cf. Halliday [1961:251]). He presents a synchronic semantic, syntactic and phonological analysis. Ponelis argues that the future tense:

(11) bá t|ó bapala 'they will play'

is a development of the construction:

(12) bá t|á || || go bapala
'they come to play'

where || || is a clause boundary, and the construction consists of a main verb (Givón's modality verb) followed by an infinitival subordinate clause. Rank shifting takes place: the main verb becomes an auxiliary verb and the subordinate clause is turned into a part of the new verb phrase. Ponelis [1975:59] puts it clearly that the auxiliary verb is still a word (and not a morpheme). This will be explained fully later.

Concerning the semantics, Ponelis [1975:51] holds that the meaning of modality verbs tends to become subsidiary to that of the verb of the subordinate clause, semantic grammaticalization follows and categorial values like "future tense" are brought about.

Phonologically the future tense developed from free to categorial cliticization and the word status of the auxiliary verb is confirmed by tone rules, according to Ponelis [1975:47, 59].

With this exposition in mind, we can now have a closer look at the "future tense" from a tonological point of view. Note that we are employing the asterisk here, as in (9) and (10) above, to indicate an underlying or derivational step which cannot be a surface configuration. Starting from its underlying structure as main (modality) verb plus subordinate clause and assigning the underlying tones to each syllable, the result is:

(13) *bá t|a || || go é t|i|fa
they come to it bring 'they come to bring it'

In this first step, the main verb and subordinate clause become semantically and syntactically more integrated/tightly fused, as:

(14) *bá t|a || go é t|i|fa

where || is a phrase boundary, and the two clauses have become a unit of main verb + fixed phrase.

In this environment it is possible for the stem -t|a 'come' of

the main verb to be changed to [+H] under the influence of the preceding /+H/ subject agreement morpheme (bá- 'they'), and followed by a phrase boundary: → *bá t|á go é t|í]a. The a shows an instance of tonal repetition. This type of tone influence is called repetition, which differs from assimilation in the following respects:

a. The word-final syllable is changed to [+H], and

b. more than one syllable is subject to change, e.g.:

(15) *bá nyaka || go béréka → bá nyáká || go béréka (Repetition)
'they want to work'

where a..a are the bearers of repeated [+H] tones, in their surface form.

Repetition (T Rep) may be schematized as in (16), where Σ=syllable:

(16) TRep: /-H/ → [+H] / /+H/ $\frac{\quad}{[\Sigma_1]}$ || COMP.³

The main verb rank-shifts to an auxiliary verb followed by the new main verb. In the process of rank shifting the g of the infinitive prefix go- 'to' is deleted, followed by the coalescence of the a of -t|a and the o of go- (## represents a full word boundary):

(17) *bá t|ó # # é t|í]a

Assimilation of the first syllable in the new main verb to the preceding /+H/ object agreement morpheme -é- takes place:

(18) *bá t|ó # # é t|í]a (TA)

This leads to a succession of four /+H/ syllables--an environment for the operation of dissimilation in terms of the rule:

(19) Tonal Dissimilation (TD): /+H/ → [-H] / /+H/₁ⁿ $\frac{\quad}{[-stem]}$ /+H/ /+Σ/₀ⁿ

as follows:

(20) bá t|ó # # e t|í]a (TD)

We have now derived the "future tense" to its surface form, since (20) is the same as example (1).

That -t|o must still be considered a word and not a prefixal morpheme is inter alia tonologically evident from the fact that the nega-

³To specify COMP more accurately, more research has to be undertaken on the relation between the word category following the complement and the tone of its initial syllable.

tive tone rule for Northern Sotho still treats -tlo as a monosyllabic verb stem. This rule causes monosyllabic verb stems of the Low class to be realized as [+H], e.g.:

- (21) /go lwa/ 'to fight'
 (22) go se lwé
 to not fight 'not to fight' (NEG)
 (23) go se tló lwa
 to not fut. fight 'not to be going to fight' (NEG)
 [Ponelis 1975:59]

5. The Long Present Tense

Due to the lack of any synchronic comparable structures for the "long present tense", a diachronic approach has to be followed in analysing its present structure. According to Meinhof [1948:111] and van Warmelo [1927:90], the present tense -a- can be traced back to *-ya (*-ga according to Guthrie's transcription) as modality or main verb. Meinhof reports that it occurs in Konde as -ja 'be, become', followed by the infinitive and in Pedi (a dialect of Northern Sotho) as a, as in:

- (24) ke a dira
 I pres. do 'I am doing'

Meinhof [1932:31] puts it clearly: *y (*g) is deleted in Sotho.

When the present tense is compared with the future tense, one is struck by the tonal similarity between the two structures, except in a few instances, which are not recorded in the following list. We will point these out at a later stage.

- | (25) Future | Present |
|--|--|
| a. re tlo hlaba
'we will slaughter' | b. re a hlaba
we pres. slaughter
'we are slaughtering' |
| c. ke tlo dí tlátja
I will them fill
'I will fill them' | d. ke a dí tlátja
I pres. them fill
'I am filling them' |
| e. ó tló tlija
'she will bring' | f. ó á tlija
she pres. bring
'she is bringing' |
| g. ó tló ba bóláya
he will them kill
'he will kill them' | h. ó á ba bóláya
he pres. them kill
'he is killing them' |

As already indicated, the present tense marker -a- is underlying /-H/. When comparing it with the future tense marker it may be deduced that the original modality/main verb *-ya is also underlying /-H/.

Tonological and morphological data indicate that the subordinate clause in these constructions can only be either infinitive or consecutive (cf. Lombard [1976:166]). The infinitive prefix and the consecutive subject agreement morpheme have an underlying /-H/ tone, which has the least tonological influence on the verb itself. Therefore, the original construction can, for example, be taken to be either (26) or (27):

- (26) *bá ya || || go é tlija
 they pres. to it bring
- (27) *bá ya || || ba é tlija
 they pres. they it bring

The following step would then be that the main/modality verb and the subordinate clause become more integrated:

- (28) *bá ya || {^{go}_{ba}} é tlija

This is followed by the repetition of the /+H/ on the subject agreement morpheme on the modality/main verb *-ya:

- (29) *bá yá || {^{go}_{ba}} é tlija (TRep)

Rank shifting takes place and the γ of the main/modality verb *-yá is deleted to result in -á- as the present modality morpheme. The infinitive prefix go- or the consecutive subject agreement morpheme is also deleted (+ = morpheme boundary):

- (30) *bá á + é tlija (Rank shift)

The first syllable of the new main verb -tlija is assimilated to /+H/ by the preceding /+H/ object agreement morpheme:

- (31) *bá á + é tlija (TA)

Finally, the object agreement morpheme is dissimilated to /-H/:

- (32) bá á + e tlija (TD)

As we have shown the full derivation of the "future tense" by examples leading up to (20), which is identical to (1), we have now shown the full derivation of the "long present", since (32) = (2). That the modality/main verb is shifted in rank to be realized as a morpheme is *inter alia* evident from the fact that it is subject to dissimilation in a favourable tonological environment, e.g.:

- (33) *ó á + é lwa

which is realized on the surface as:

- (34) → ó a + é lwa (TD)
 he pres. it fight 'he is involved in a fight'

6. Differences Between Future and Present

When it occurs in a similar tonological environment, the future tense marker is never dissimilated, but is realized with a /+H -H/ tone sequence (phonetically a falling tone) concomitant with a half-long vowel:

- (35) ó tɬó· # # é lwa
 he will it fight 'he will be involved in a fight'

In other words, dissimilation is realized when the historical word boundary is deleted, but not when the full word boundary is still present. According to Hyman [1975:196] a full word boundary is "hard to penetrate" and therefore dissimilation is not realized in the case of the future tense.

The /+H -H/ tone sequence is the result of the coalescence and fusion of -tɬa as original main/modality verb being /+H/ due to repetition, and the underlying /-H/ of the infinitive go-. This fusion gives rise to inherent quantity (being realized as a half-long vowel), which reveals the polymorphemic origin of -tɬo and that clarifies its /+H -H/ tone sequence.

On the other hand, the present tense marker -a- is never realized with a /+H -H/ tone sequence, not even in rhythmic quantity position (i.e. the penultimate syllable in a sentence). This is evident from the following comparison:

- (36) a. bá tɬó: # # já b. bá a: + já
 'they will eat' they pres. eat 'they are eating'

This indicates that no trace of fusion or coalescence is left in -a- and it is realized as a single morpheme.

Another reason why Ponelis [1975:59] regards the future tense -tɬo as a word is that the relative suffix -gó is affixed to a word, a verb, e.g.:

- (37) (bá) bá tɬo -gó # # tɬíjɬa (-TA)
 (those) they will-who bring 'they who will bring'

His view is tonologically supported by the absence of the assimilation of the first syllable of the new main verb. This can only be ascribed to the ability of the full word boundary to block the operation of this rule. Similarly, dissimilation is blocked by the full word boundary in an otherwise favourable tonological environment:

- (38) (bá) bá tɬo -gó # # é tɬíjɬa (-TD)
 (those) they will-who it bring 'they who will bring it'

in which the object agreement morpheme é- is not dissimilated.

This same phenomenon also occurs in an environment where the final /+H/ syllable in an utterance is lowered when preceded by a /+H/ penul-

time syllable. This may be formalized as Final-syllable Lowering (FsL), below, where sentence boundary is marked by ≠ :

(39) FsL: /+H/ → [-H] / /+H/ ___ ≠

This rule operates, for instance, when an underlying /+H/ monosyllabic verb stem in sentence-final position is preceded by the /+H/ subject agreement morpheme as penultimate syllable:

(40) *ga bá fé ≠ → ga bá fe ≠ (FsL)
 not they give
 'they don't give'

Final-syllable lowering is blocked when a full word boundary precedes the final syllable in the future tense with the relative suffix, e.g.:

(41) (bá) bá tlo -gó # # f_á (-FsL)
 (those) they will-who give
 'they who will give'

7. Summary

Tonological evidence supports the following points:

a. Both constructions developed from a main/modality verb plus subordinate clause sequence.

b. The whole structure with -tlo has rank-shifted from a separate clause with a main verb to a part of a clause with -tlo as an auxiliary. This is evident from the fact that:

1. -tlo is not subject to dissimilation (35),
2. it is realized with a /+H -H/ sequence concomitant with inherent quantity (35),
3. assimilation of the first syllable after the full word boundary is absent (37),
4. dissimilation in an otherwise favourable tonological environment is blocked by the presence of the full word boundary (38),
5. final-syllable lowering does not operate when preceded by a full word boundary (41), and
6. it is treated as a monosyllabic verb stem by the negative tone rule (23).

c. The present tense marker has shifted in rank from main/modality verb to become a single morpheme, a modality prefix. This is evident from the fact that:

1. it is subject to dissimilation (34), and
2. it is not realized with a /+H -H/ tone sequence--not even in rhythmic quantity position (36).

Without any doubt, these structures can be interpreted along the

same lines for other Bantu languages. In this regard, Dr. Hazel Carter (London University) informed me in a personal communication that this historical development is supported tonologically in the case of Shona (Zezuru) for both structures. Furthermore, she presented synchronic evidence to illustrate different stages of development⁴ in Northern and Southern Tonga, e.g.:

<u>Northern</u>		<u>Southern</u>
u-na ku-langa		unoolanga
	'he will look'	

⁴Ponelis [1975:47,48] also refers to Zulu in connection with this phenomenon.

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DOWNSTEP DISPLACEMENT IN KIKUYU (abstract)

Kevin C. Ford
University of Nairobi

G. N. Clements
Harvard University

1. We are concerned with a number of processes in Kikuyu tonal phonology involving downstep, and with the contribution Kikuyu affords to our understanding of the status of downstep in phonological theory. Specifically, we propose to view downstep as a phonological entity ordered among the tonemes which constitute an independent level of phonological representations [Clements 1976], rather than, as in some treatments, an intonational process determined by certain features (or configurations of features) within the feature matrices defining tones.

We review the major tonal processes involving DS (downstep) in 23 Kikuyu idiolects, representative of the northern, southern, and western districts of the Kikuyu-speaking region. The processes in question are rules of phrase phonology (rules of "external sandhi"), dependent upon both a bipartite division of nongrammatical morphemes (for the most part, independent words) into two tonal classes, I and II, and the syntactic configurations in which these may occur. These processes are summarized in the following sections. In several cases, it can be shown that significant generalizations can be formulated only if DS is viewed as an entity ordered among strings of tonemes. Space permits the discussion of only two such cases in this abstract.

2.1 Noninterrogative sentences are marked finally by intonational processes of key-lowering which can be summarized as follows:

R.O. $\emptyset \rightarrow / \underline{\quad} L_Q (H_Q) \#_S$ (where L_Q is a maximal string of
L tones_Q)
né mwayáhiŋá [- - - -] 'he's a weakling'
mwayáhiŋá mórito [- - - -] 'heavy weakling'

It will be noted that DS is "total" (Meeussen) in the sense that a sequence L^1H is phonetically equivalent to the sequence LL , the sequence H^1H to the sequence HL , etc. As RO is an automatic, exceptionless process in these sentences the DSs it introduces are fully predictable and are not indicated in the examples.

not impossible that this diacritic marking may be eliminable in favor of a purely phonological analysis, but this will not affect our discussion. All unstable H (UH) tones become L before a H tone across a WB, provided that no DS intervenes:

R4. UH → L / ___ # H

As before (sec. 2.5), no special mention need be made of the condition that no DS intervenes, since a string of the shape UH # ! H does not meet the SD of the rule.

2.7 Two contiguous DSs undergo context-free deletion:

R5. !! → ∅

2.8 These rules can be illustrated by the following further derivation (all items crucially involved are class I):

he	gave	Njuguna	banana	heavy	one	long ago	very	
/né	ahéiré	njoyóná	iriyo	irito	rémwé	tene	monó	/
H L	L H	L H H!	L L L	L L L !	H H !	L L !	L H !	(by DS intro)
H L	L H	L H H	H H H	H H H !!	H H	H H !!	L H !	(by R1)
H H	L H	L H H	H H H	H H H !!	H H	H H !!	L H !	(by R2)
H H	L H	L H L	H H H	H H H !!	H L	H H !!	L H !	(by R4)
H H	L H	L H L	H H H	H H H	H L	H H	L H !	(by R5)

Naturally, single DSs remaining in strings after the operation of R1 are not deleted (see e.g. the example in sec. 2.3). Sentence-final DSs have no phonetic effect.

3.0 The summary of Kikuyu tone sandhi presented here can only be regarded as a very schematic overview of a system that offers many complexities. We believe, however, that it accurately characterizes the nature, if not the detail, of the tonal processes involved.

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IDIOSYNCRATIC, SUPRASEGMENTAL PROCESSES IN MENDE

David J. Dwyer
Michigan State University

1. Introduction

In my paper read before the conference on African linguistics in Gainesville [Dwyer 1976], I claimed that Mende was not a suprasegmental tone language of the type envisioned by Leben [1973]. Yet, in that paper I suggested that there were a number of processes in Mende which nevertheless appeared to be of a suprasegmental nature. In this paper, I present two types of these processes, the development of the H HL tone pattern and "demorphologized" compounds and then show first how these phenomena support an autosegmental view of phonology and second, how idiosyncratic features fit into a general theory of phonology.

2. The Development of the H HL Tone Pattern

Mende contains a small set of disyllabic morphemes that display a high-falling tone pattern. These words, taken from Spears [1968] are given in (1):

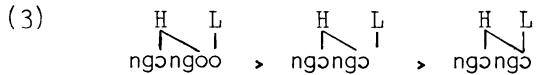
- (1) ngóngô tooth hókpô navel pókô imitate
 tókplâ seat, bottom mbémbé circle

Because examples of this tonal pattern are few in number and because this pattern is not present in Proto Southwestern Mande, the high-falling tone pattern appears to be a fairly recent development in Mende. The ways in which this pattern arose provide an important insight into the nature of suprasegmental tone processes.

One source of this tone pattern appears to be from the loss of a final low-toned syllable with the reassignment of the low tone to the preceding syllable. Evidence for this comes from the various alternate forms reported for 'tooth' and 'navel' by Spears [1968] and by Innes [1969]. Interestingly, these variants do not all appear in the same dialect, or possibly idiolect, but appear to be randomly distributed as the following example (2) illustrates:

- (2) ngóngólì (S), ngóngóù (I), ngóngóó (S), ngóngô (S,I) S=Spears [68]
 hókpólì (I), hókpóì (I), hókpóù (I), hókpô (S,I) I=Innes [69]

Clearly the variants given in (2) suggest a progression from left to right and that some of the forms given in (1) represent reduced versions of fuller forms. And from this analysis we can conclude that a suprasegmental tonal process is involved. By suprasegmental I mean that the tonal melody of the words in question is to some extent independent of the composition of the segments to which the melody is associated. This suprasegmental process is adequately described by the autosegmental framework developed by Goldsmith [1976], as the following derivation (3) illustrates:



It is important to also note that this process is idiosyncratic, that is, it does not apply to all potential forms. For example, neither Innes nor Spears recorded all variations from their sources. Secondly, not all potential inputs to the process described in (3) undergo the process, as the examples in (4) illustrate:

- (4)
- | | | | |
|-------------|---|-----------|---------------|
| kpɔ́ngbɔ̀nì | ~ | *kpɔ́ngbô | 'palsy' |
| ngéngéù | ~ | *ngéngê | 'finger nail' |
| bòtánì | ~ | *bòtâ | 'fist' |

A second source for the high-falling tone pattern appears to result from syncope rather than from apocope. This process differs from the first because it results in a medial consonant-liquid cluster. The following set of examples (5) show the optional application of this process:

- (5)
- | | | | | | | | |
|--------|---|------|-------|-------|---|-----|---------|
| ngí là | ~ | nglâ | 'dog' | kú lò | ~ | klô | 'small' |
| ngú lè | ~ | nglô | 'oil' | | | | |

On the basis of this evidence, it appears likely that a word like tɔ́kplâ with its consonant-liquid cluster was originally derived from a fuller form, say tɔ́kpɔ̀|là or tɔ́kpá|là in much the same way that the short form fú|fî 'dust' is derived from its free variant fúfú|lè.

In considering this second process, it too is clearly suprasegmental in nature and is clearly idiosyncratic. Thus the development of the high-falling tone pattern in Mende appears to be the result of two independent processes, both of which are idiosyncratic and both of which are suprasegmental in nature.

Evidence of this sort, the loss of a segment and the reassignment of its tone to an adjacent syllable, has been used by Goldsmith [1976] and others to support an autosegmental view of phonology. The data may be novel in the sense that these processes are highly idiosyncratic, but as such do not really provide any new support for the autosegmental position.

In the next section, I present evidence that if correct provides even stronger evidence in support of autosegmental compounds.

3. Demorphologized Compounds

A detailed examination of the Mende lexicon reveals a substantial number of word forms which appear to be compounds on the basis of their general morphological appearance, but which in one way or another deviate from compounds. In Table 1, items (a-c) represent normal compounds, while the others (d-m) represent what I call demorphologized compounds.

I use the term "demorphologized compounds" because these forms cannot be directly generated from their constituent morphemes without the additional application of ad hoc rules, implying of course that these forms are no longer regarded as morphologically complex and consequently entered as individual units in the lexicon. By the term "true compound" I mean the anticipated form of the compound were it derived from the suggested constituents using the known compound rules. For details see Spears [1968].

In examining these compounds, it becomes clear that while these demorphologized compounds (examples (e) through (m)) appear to be the result of idiosyncratic processes, their form is nevertheless constrained in a very definite way. In order to demonstrate this, the following observations are important:

- (6) a. Item (e) and (f) have the same number of syllables as the true compound.
- b. Items (f, g, h, i, j and k) have one less syllable than the true compound.
- c. Item (l) has the same number of syllables as the true compound, but the tones have been repositioned.
- d. Item (m) has one more syllable than the true compound.

Assuming that the "demorphologized" compounds were originally derived from their corresponding true compounds, an assumption which is by no means certain, the question arises: in what way are they derived and what principle do they follow? A closer examination reveals that they all have three syllables and three tones. This observation could be explained by what I call the principle of tonal/segmental parity (7):

- (7) The least marked relationship that can exist between a tonal melody and a string of syllables is for each note of the melody to be uniquely associated with one tone-bearing segment.

All of the examples in Table 1 contain a three note melody (L H L). Using the principle of tonal/segmental parity we would expect that items

Table 1. Normal vs. Demorphologized Compounds

Gloss	Demorphologized Compound	True Compound	First Constituent	Second Constituent
a. woman	nyàhâ	nyà + hâ	nyá ?	há female
b. child	ndòpô	ndò + pô	ndó child	pò ?
c. tear	ngàyâ	ngà + yâ	ngă eye	yă water
d. fire	ngòm̄bû	ngòm̄ + bû	ngõŋ fire	bù in
e. girl	nyàápò	nyàhá + pò	nyàhâ woman	pò ?
f. male	hìfndò	hìní + ndò	hìní man	ndó child
g. potato leaf	njòlââ	njòpò + láwà	njòpò potato	lâwâ leaf
h. God	ngèwòò	ngèlè + wòò	ngèlě sky	wòò big
i. spy	mànéè	màà + nénéè	màă on	nènè shadow
j. pipe	tàvéè	tàwà + véè	tàwă tobacco	vèè bowl
k. snuff	tàvúka	tàwà + vúka	tàwă tobacco	vúká powder
l. morning	ngèéndà	ngèlè + ndâ	ngèlě sky	ndă mouth
m. saliva	ndàáyà	ndà + yâ	ndă mouth	yă water

(e) and (f) would be fully unmarked in this respect because they have the same number of notes and syllables. Accordingly, items (g) through (k) would be considered marked because they contain one more tone-bearing segment than notes. Thus, the demorphologized compounds appear to have achieved parity through the loss of a tone-bearing segment. And surprisingly, item (l) while having the same number of notes and tone-bearing segments, achieves parity through the reassociation of the notes according to the principle in (7). Finally, and even more surprising, in order to achieve the supposed tonal/segmental parity, the demorphologized compound (item (m)) appears to have acquired an additional tone-bearing segment, when compared to its "true" form. These developments are summarized in (8) below, using an autosegmental notation:

(8) a. Syllable Maintaining

$$\begin{array}{ccc} \text{LH} & \text{L} & \text{LH L} \\ || & | & || | \\ \text{nyaa} & + \text{po} & \rightarrow \text{nyaapo} \end{array}$$

b. Syllable Decreasing

$$\begin{array}{ccc} \text{L} & \text{H L} & \text{L H L} \\ \wedge & | | & | | | \\ \text{tawa} & + \text{vuka} & \rightarrow \text{tavuka} \end{array}$$

c. Note Reassigning

$$\begin{array}{ccc} \text{L} & \text{HL} & \text{LH L} \\ \swarrow & \downarrow & | | | \\ \text{ngele} & + \text{nda} & \rightarrow \text{ngeenda} \end{array}$$

d. Syllable Decreasing

$$\begin{array}{ccc} \text{L} & \text{HL} & \text{LH L} & \text{LH L} \\ | & \downarrow & | | | & | | | \\ \text{nda} & + \text{ya} & \rightarrow \text{nda ya} & \rightarrow \text{ndaaya} \end{array}$$

As mentioned earlier, the principle of tonal/segmental parity, if correct, offers even stronger support for the partial autonomy of the tonal tier. In this instance, not only is the tonal melody preserved, but under certain conditions which are as yet not fully understood, the tonal tier can actually affect the segmental composition of a given word, as was evidenced by the evolution of the word "saliva" given in (8d).

At this point caution should be exercised, because thus far only one such example of the progression (8d) has been found, and consequently the strength of the claim made above is slight. Nevertheless, additional support for the principle of tonal parity can be found elsewhere in Mende, and again we observe that these examples involve idiosyncratic processes.

The first set of examples (9) involves four pairs of free variants. In each of these cases, evidence can be presented to show that the shorter form has been derived from the longer form, at least historically, thus representing a progression that is in accord with the principal of tonal/segmental parity. Again, it is of interest that these alternations must be considered idiosyncratic because not all words of this type show these alternations.

- (9) póómà ~ pómà back, behind ngòyòngóyó ~ ngòngóyó
 njàtóló ~ njàtó water plant (njǎ = water) gravel
 ngóíhú ~ ngóhú ear

Furthermore the alternation of the word glossed as 'gravel', which in its full form is clearly a reduplicated morpheme, suggests that the large percentage of words of the type: $C_1V_1C_1V_1C_2V_2$ may also be reduced reduplicates which are moving in the direction of tonal/segmental parity. These examples are given in (10) below:

- (10) ndòsòlò <? *ndòlò + lòlò earth, ground
 kókòlì <? *kòlì + kòlò to seek
 kékélé <? *kélé + kélé fraction
 fùfùlò < *fùlò + fùlò dust
 fìvìlì < *fìlì + vìlì shake (dry)
 tòòlò < *tòlò + lòlò kola nut

The evidence given in (9) and (10) strongly suggests that the principle of tonal/segmental parity (7) is a true operating principle in Mende, and interestingly suggests one way in which partially reduplicated forms arise diachronically.

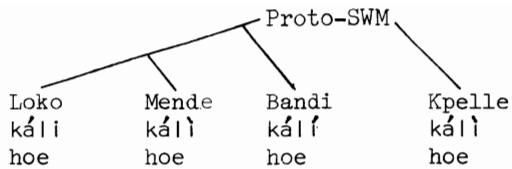
Before going further, I would like to point out an apparent contradiction to the principle in (7). The data presented in section one show that certain processes appear to operate against the principle of tonal/segmental parity, because it results in a falling tone (where two notes are assigned to the same syllable).

This development may not be in opposition to the principle, however, for a number of reasons. First, the reason for the developments in section 2 appears to be reduction processes, while that in section 3 appears to be a word internal readjustment. Thus section 2 processes can be seen as bunching processes while section 3 processes are unmarking processes. Second, we may note that while the association of notes in (1) may violate the principle in (7), the numbers of notes and tone-bearing segments do not. Given this second observation, we might expect the derived H HL words in (1) to eventually reduce to H L words, because of the principle of tonal/segmental parity.

Although it is not clear at this point, there is some evidence in the history of Southwestern Mande (of which Mende is a member) that the restructuring of H HL to H L may have taken place once before.

The Southwestern Mande languages contain a small set of morphemes which have a high-falling pattern in Loko, a high-high pattern in Bandi, and a high-low tone pattern in Mende and Kpelle (the Loma data is irrelevant here). The generally accepted family tree relationship of these languages is given in (11):

(11)



suggests a situation more awkward than the new alternative suggested here, the possibility of a parallel evolution of H HL to H L in both Mende and Kpelle can be tolerated.

Furthermore, this reinterpretation of the development of this tonal pattern permits a better statement of its development in Southwestern Mande. According to Dwyer [1973], only two tonal classes in Southwestern Mande have cognates in Northern Mande (the most closely related group of languages). These are *(H)H and *(L)P, where P = polarized tone, while the remainder: *L HL, *H L (reanalyzed here as *H HL) and *L L represent recent (Proto Southwestern Mande) innovations. Evidence of the sort presented in (6) was used to suggest that the *L HL tone patterns may have resulted from opaque nominal compounds while the remainder could only be explained as borrowings. With the reanalysis of *H L as *H HL, it is possible to suggest that at least some of the H HL words arose from the processes illustrated in section one of this paper. The result of this reanalysis, in addition to maintaining coherence with the principle of tonal/segmental parity, suggests that borrowing may have had less influence on the development of Southwestern Mande tone patterns than was previously supposed.

4. Implications

This paper raises a number of issues which may serve as avenues of future research;

- a. the nature of idiosyncratic tone processes
- b. the nature of phonological complexity or markedness

4.1 Idiosyncratic processes. Each of the suprasegmental processes described here are idiosyncratic in nature. That is, while we can provide a statement of the class of words which undergo a particular process, we cannot identify the specific words which fit that process. This notion parallels Labov's [1972] observation of the fronting rule in New York City English. While it is possible to characterize the class of words undergoing this process (those containing æ), not all of the words in this class undergo this fronting process. Furthermore, even though the number of words which do undergo the process are increasing, it was impossible to determine which word would be next. Although these processes have been characterized as idiosyncratic with respect to the particular words to which they apply, the nature of the phonological changes are clearly identifiable as a legitimate phonological process. Thus, once a particular phonological string undergoes a particular rule, there is no doubt as to its outcome.

The fact that idiosyncratic processes exist in language gives rise to the question how might this fact be incorporated into a theory of phonology and why? The question can most appropriately be answered given a lexicalist view of the lexicon such as that provided by Jackendoff [1975], who argues that whole words as strings of morphemes are stored in the lexicon rather than individual morphemes as the 1965 Aspects model suggests.

Given this view, we can distinguish between idiosyncratic rules which apply within the lexicon and the standard, regular rules which apply to the output of the lexicon. (The model of "upside down phonology" as put forward by Leben and Robinson [1975] with its notion of frozen rule could easily be incorporated in this framework, as could the notions of natural phonology put forth by Vennemann, Stampe and Hooper.) Although space does not permit a full elaboration of the point, it is worth noting that many rules which start out as idiosyncratic rules later become regular and then apply to all words which meet the structural description of the rule. This observation provides at least one answer to the complex question: where do (regular) phonological rules come from?

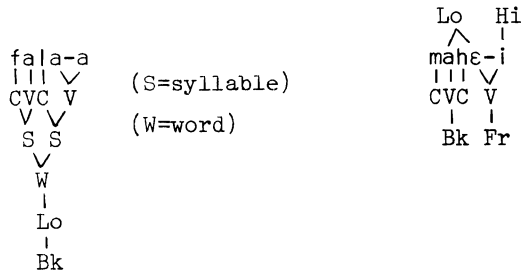
Secondly, a systematic examination of these idiosyncratic processes may lead to a better understanding as to why such processes exist, particularly in the light of "reductive" processes. Drawing from Zipf's observation that there is a strong positive correlation between a word's semantic complexity and its phonological complexity, Eulenberg [1964] concludes that rules actually operate to bring about a better balance between semantic content and phonological content. Eulenberg further points out that such a proposal does not "itself predict the existence or exact nature of individual rules, but rather acts as a constraint on the definition of a possible...rule" [Eulenberg 1964:198].

Before going further, I would like to add to this proposal the suggestion that the frequency of use of a given morpheme may have an equally important bearing on the question of phonological complexity as well. This is consistent with Zipf's observation because function words are not only smaller in semantic content than major category words, but more frequent in occurrence.

Logically following from this proposition is the conclusion that idiosyncratic rules are those which generally cope with an informational imbalance of individual lexical items while regular rules are those which cope with the imbalance of whole word classes. Taking this fact and the observation that word classes are generally defined by affixes, and the fact that the semantic content of an affix is considerably less than the free standing word from which it is derived, we can begin to see why so many regular (morphophonemic) rules involve affix boundaries while the idiosyncratic processes do not, and why morphophonemic rules are reductive.

This brief statement is intended to give an insight into the nature of idiosyncratic phonological rules and their relationship to a general

(15)



By the definition of tension in (12), each of the forms in (15) can be seen to be less tense versions of their underlying forms. Likewise, the developments given in (2) can also be seen to follow a tension-reducing progression.

These two examples serve to illustrate that the principle of tonal/segmental parity and its more general case, phonological tension, may be useful in explaining why certain types of phonological rules develop the way they do. First, the addition of an affix creates tension which subsequently is reduced by phonological rules.

5. Conclusion

In this paper, I have examined a number of idiosyncratic phonological (suprasegmental) processes in order to demonstrate, first, that while these processes are idiosyncratic, they are not random, and second, that because they are not random they are of phonological interest. The particular interest that such processes give concerns 1) the relationship between general and idiosyncratic processes, 2) the possible origin of some types of phonological processes, and 3) an insight into the interrelationship between various melodic tiers such as tone, vowel quality, etc.

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153-54 (Lord)

YUKULTA: 8:27 (McConvell)

ZAAR: Supp. 6:171 (Newman)

ZALAMO: Supp. 6:95, 99, 108 (Hinnebusch)

ZARMA: 9:1, 12, 25-29 (Nicolai)

ZIGUA: Supp. 6:95, 103, 106, 108 (Hinnebusch), Supp. 7:216 (Sedlak)

ZILMAMU: Supp. 7:12-13, 17, 19 (Bender)

ZIME: Supp. 7:38-39 (Ebert)

ZULU: 8:152-53, 157-65, 168 (Herbert), 9:158-62 (Herbert), 9:212
(Angogo), 9:327 (Lombard), Supp. 6:191 (Nyaggah), Supp. 6:
214 (Schachter)

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Lanham, L.W., and K.P. Prinsloo (eds.). *Language and Communication Studies in South Africa*. Cape Town: Oxford University Press, 1978. \$15.50.

A survey of the linguistic setting of South Africa, including both native African languages and languages of European origin. The twelve chapters are arranged under the headings "The setting", "The main languages of South Africa", and "Language in education".

Napoli, Donna Jo (ed.). *Elements of Tone, Stress, and Intonation*. Washington: Georgetown University Press, 1978. \$3.50.

A collection of five papers presented at the 1977 Georgetown University Round Table on Languages and Linguistics. The papers are Larry M. Hyman "Tone and/or accent", George N. Clements "Tone and syntax in Ewe", Ilse Lehiste and Pavle Ivić "Interrelationships between word tone and sentence intonation in Serbocroatian", Jean-Marie Hombert "A model of tone systems", and Ellen Schaubert "Focus and presupposition: A comparison of English intonation and Navajo particle placement."

The following publications are all published by the Société d'Etudes Linguistiques et Anthropologiques de France (SELAF):

SELAF
5 rue de Marseille
75010 Paris
France

Bouquiaux, Luc (ed.). *Théories et méthodes en linguistique africaine: communications au 11ème Congrès de la SLAO Yaoundé, avril 1974*. Paris: SELAF, 1976.

A collection of nine papers on a variety of topics presented at the 1974 Congress of the West African Linguistic Society. Included with the book is a tape cassette illustrating drum language and tonal patterns discussed in two of the papers.

Faïk-Nzuji M., C. *Devinettes tonales tusuwinu*. Paris: SELAF, 1976.

A description of riddles in Tusumwinu, a language of Zaire, which rely on tonal clues. Included is a corpus of 200 riddles

Letouzey, René. *Contribution de la botanique au problème d'une éventuelle langue pygmée*. Paris: SELAF, 1976.

Documents biological terminology which is similar from one Pygmy group to another, even though the various groups now speak language very similar to or identical to non-Pygmy neighbors.