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Z U L U T O N O L O G Y

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ABSTRACT

This dissertation studies the tonemic system of Zulu in order to discover the phonological tones (i.e. the 'tonemes') of the language, and to formulate the tonal rules that are responsible for converting these phonological tones into phonetic tones. In order to determine the phonological tones, all the phonetic tones (i.e. the surface tones) of Zulu are first identified. This is accomplished by classifying the tones occurring in the surface structures of all syntactic categories, i.e. nouns, verbs, relatives, etc. The classification yields twelve surface tones. Next, the factors that condition phonetic variation are identified, viz. the phonological feature [+ slack vocal cords] which conditions up-glides, vowel length which conditions down-glides, tonal assimilation which raises the pitch of some tones, and, finally, statement intonation which conditions the lowered final tone. This sifting process yields three phonological tones in the surface structures examined. These are High, Low and the High-Low tone cluster which is realized only on a syllable with a long vowel. Next, the underlying tonal matrices of the morphemes of Zulu are determined. The frame /àkúkhò _____/ is used to determine the underlying tonal matrices of verbs and nouns. For other syntactic categories different devices are employed. Finally, the tonal rules that derive surface structures from the underlying representations are formulated. The majority of these tonal rules have a functional motivation in the sense that their operation or conditions blocking their operation conspire to preserve specific information in phonetic strings, namely, the regulation of tonal prominence according to a hierarchy of morphemes in which suffixes dominate stems which dominate prefixes, the preservation of penultimate syllable prominence, and finally the preservation of tone class categorization.

DECLARATION

I declare that this dissertation is my own, unaided work. It is being submitted for the degree of Master of Arts in the University of the Witwatersrand, Johannesburg. It has not been submitted before for any degree or examination in any other University.

J.S.M. Khumalo

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17th day of March, 1981.

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PREFACE

Zulu, the mother tongue of more than five million people, is one of the principal languages of South Africa. It belongs to the South Eastern Zone of the Niger-Congo family. The South Eastern Zone includes four language groups of the Republic of South Africa, viz. Nguni, Sotho, Tsonga and Venda. Four languages constitute the Nguni group, viz. Zulu, Xhosa, SiSwati and Ndebele. There are two principal tonal dialects of Zulu, viz. the Natal Coast dialect, spoken in the urban areas along the Natal Coast, and the KwaZulu dialect, spoken in the rural and urban areas of KwaZulu. Tonal variation between these two dialects is minimal:

The Natal Coast dialect applies Phrase Medial Tone Shift (a rule that shifts a high tone to the penultimate syllable of a word in phrase medial position, see 4.9) in more environments than does the KwaZulu dialect, e.g.

Natal Coast Dialect		KwaZulu Dialect
ùkúsèbè'nzísà	"to use"	ùkúsè'bénzìsà

The lexical high-low tone cluster is associated with fewer morphemes in the Natal Coast dialect than in the KwaZulu dialect, e.g.

Natal Coast Dialect		KwaZulu Dialect
úkò:'ná	"to spoil"	ú'kô:nà
úkù'bhá:là	"to write"	úkù'bhâ:là

The feature [+ slack vocal cords] (see 1.1.3) is introduced in more constructions in the Natal Coast dialect than in the KwaZulu dialect, e.g.

Natal Coast Dialect		KwaZulu Dialect
l$^{\text{fi}}$ɛ́sò	"that one (cl.7)"	lésò
bɛ́'dálà	"they are old"	bá'dálà

This study of Zulu tonology is based on these two dialects.

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LIST OF ABBREVIATIONS AND SYMBOLS

C	=	Consonant
V	=	Vowel
K-Zd	=	KwaZulu dialect
N-Cd	=	Natal Coast dialect
!	=	Statement Intonation
?	=	Question Intonation
$	=	Syllable boundary
+	=	Morpheme boundary
-	=	Internal word boundary
#	=	Word boundary
##	=	Phonological phrase boundary
>	=	becomes
<	=	derives from
V́	=	Vowel with a high tone
V̀	=	Vowel with a low tone
V̂	=	Vowel with a high-low tone cluster
V:	=	Long vowel
(C)V	=	Stressed syllable
U.R.	=	Underlying Representation
S.S.	=	Surface Structure

All other abbreviations and symbols throughout the text are explained in context.

0.0 INTRODUCTION

0.1 What Type of Tone Language is Zulu?

That Zulu is a tone language is clearly beyond question. However, it is of interest to ask what sort of tone language it is. The answer is that it presents a mixed typology. So far as non-verbal forms are concerned, Zulu is what has, traditionally, been called a lexical tone language, in which there is, largely, free choice of tone for each syllable. Two general constraints, however, apply to this choice:

a. The lexical high-low tone cluster is restricted to the penultimate syllable of the root of the morpheme it is associated with.

b. The sequences H H, H $\widehat{HL}$ and $\widehat{HL}$ H are barred morpheme internally.

The convention governing the association of tones with morae (i.e. tone-bearing units) in non-verbal forms is that the first tone in a domain is associated with the first mora, the second tone with the second mora, and so on. Any toneless morae remaining are assigned a low tone by convention (cf. Toneless Low Convention, 1.3.1).

Excepting for the two general constraints mentioned above, non-verbal forms have a free choice of tone per syllable, which is illustrated in the following tri-syllabic noun stems:

U.R. $\begin{bmatrix} H \\ i \end{bmatrix}\begin{bmatrix} L \\ li \end{bmatrix}\begin{bmatrix} HLH \\ bululu \end{bmatrix}$ ## "puff-adder"

S.S. î:'búlù:'lú

U.R. [H i][L si][LLL bhedlela] # # "hospital"

S.S. ìsìbhédlè:là

U.R. [H i][L li][LHL gobongo] # # "wide-mouthed calabash"

S.S. í:gò'bó:ngò

U.R. [H iN][LLH jemane] # # "palm wine"

S.S. ínjèmà:'né

U.R. [H i][L si][LHL̂L hlabathi] # # "sand"

S.S. ìsíhlà'bâ:thì

In verbal constructions, however, one essentially gets a contrast between high i.e. H or HL and low-toned verbs. Thus in the case of verbs, there is not a free choice of tone on each syllable. The high tone in all high toned verbs, is associated with a designated mora which we mark with an asterisk. In disyllabic and longer verbal roots this designated mora is the penultimate one. The Toneless Low Convention, introduced later, then assigns low tones to all other morae.

Examples:

U.R. [L ngi][L ya][H phu*z+a][a] # # "I am drinking"

S.S. ngì yà phú:zà

U.R. [H ba][L zo][HL̂ dla*l+a] # # "They will play" (K-Z D)

S.S. bázò'dlâ:là

U.R. [L ngi][L ya][H seben*z+a][a] # # "I am working"

S.S. ngìyàsèbé:nzà

In terms of the most recent discussions on accentual typology, we might describe the non-verbal system of Zulu as a pitch-accent system with fixed accent "But what would a pitch-accent system with lexically contrastive tone melodies and fixed accent look like? The answer is: a system of precisely the type that is usually termed a 'lexical-tone system'",(Clements and Ford 1979: 200), and the verbal system as a pitch-accent system with free accent.

"The distinction between free accent and fixed accent entirely accounts for the linguistic distinction between systems with moveable tonal loci, and systems without such loci. To postulate the further distinction that systems of the latter type have no accent at all is, strictly speaking, superfluous." (Clements and Ford, 1979, 200).

0.2 Domains of Tone Association

In Zulu, morphemes are the domains within which tone association takes place, and we use square brackets to demarcate these domains.

Examples:

U.R. [H i][L si][HL ngisi] ## "the English language"

S.S. ísì'ngí:sì

U.R. [H u][L ya][H hamb+a][a] ## "He is leaving"

S.S. úyà'há:mbà

In certain cases this leads to tonologically complex representations that are associated with segmentally simple morphemes, such as the case of initial floating H's with absolute pronouns, e.g.

$$\begin{bmatrix}H\end{bmatrix}\begin{bmatrix}L\\mi\end{bmatrix} \qquad \text{"me"}$$

It is necessary that the domain of the initial H be separate from that of the L for the purpose of tonal association. In order, however, to 'locate' this H lexically, we shall bracket the string as a complex morpheme involving tones and segments:

$$\left(\begin{bmatrix}H\end{bmatrix}\begin{bmatrix}L\\mi\end{bmatrix}\right)$$

In 1.3.1 below we shall return to the question of associating tones with morae.

0.3 Prominence

In many tonal studies the word "prominence" is used as a cover term to include stress, tone and duration. In Zulu, in addition to prominence involving stress, high tone (i.e. tonal prominence) and duration (i.e. vowel length), there is also penultimate syllable prominence.

0.3.1 Penultimate Syllable Prominence

Penultimate syllable prominence (PSP), which is marked with the feature [+ prominence], is a lexical feature of stems. The distinct features of [+ stress] (see 1.2.2) and [+ prominence] both give rise to syllables that are "prominent" in a general sense, but there are restrictions on the co-occurrence of the features that induce prominence; the prominence of a final long (i.e. bi-moric) vowel or of a stressed vowel takes precedence over PSP and consequently [+ prominence] deletes in the presence of [+ stress] or of a final bi-moric syllable. A stressed vowel and a final long vowel are mutually exclusive. In the following examples, the penultimate syllable of example 1 is prominent, while those of examples 2 and 3 are non-prominent because of the occurrence of

[+ stress](indicated by "=" in syllable 1 of example 2), and of a final bi-moric syllable in example 3.

Examples:

1. ngìyàgèzà "I am washing"
2. ntíní'ní Ideophone depicting fast runni
3. ngòfô: "at four o'clock"

Penultimate syllable prominence has a wide ranging effect on phonological processes in Zulu:

1. It is a condition for the application of Penultimate Mora Creation, i.e. "syntactic" length occurs only with prominent penultimate syllables of phrase final words (see Penultimate Mora Creation 1.2.1.2).

   Examples:

   ngìyàgè:zà # # "I am washing"

   But:

   ntínìní # # Ideophone depicting fast running
   ngòfô: # # "at four o'clock"

2. It asserts the prominence of the penultimate syllable in the phrase medial position (i.e. even where the vowel is short) by conditioning high tone shift onto that syllable (see Phrase Medial Tone Shi..., 4.9).

   Examples:

   bàsàgézà # ì'zí:tshà # # "They are still washing the dishes"
   cf. bàságè:zà # # "They are still washing"

3. It adjusts any imbalance in syllable prominence by causing the high tone on a non-prominent final syllable of a phrase medial word to convert to a low tone (see Phrase Medial Final Tone Lowering, 4.10).

   Examples:

   ɪ́zìnjà # zìyâ!dlá ## "The dogs are eating"
   cf. ɪ́zì:njá ## "dogs"

4. It blocks the creation of any imbalance in syllable prominence by blocking the displacement of a high tone from a prominent penultimate syllable to a non-prominent final syllable (see Tonal Displacement, 4.11).

   Examples:

   $n^{ɦ}$ɡ́mì "and me"
   cf. $n^{ɦ}$ɡ̀ló "and this one"

0.3.2 Tonal Prominence

The high tone is the tone of prominence in Zulu. The low tone on the other hand, functions more like a non-tone. The high tone gives tonal prominence to any morpheme it occurs with. It is for this reason that when, in some constructions, two high toned morphemes are contiguous, the tonal rules of Zulu adjust the tones according to the dominance hierarchy (see 0.3.3 below), i.e. tonal prominence is given to the morpheme with higher ranking by allowing it to be associated with the high tone, while tonal prominence is removed from the lower ranking morpheme by converting its high tone to a low tone.

In our discussion of penultimate syllable prominence, we noted that in order to adjust any imbalance in

syllable prominence, a high tone on a non-prominent final syllable gets converted to a low tone. Here again, tonal prominence is removed from a syllable with lower ranking. Since, as we shall see later, the tonal rules of Zulu manipulate high tones only, it can truly be said of them that they are rules that regulate the occurrence of tonal prominence.

0.3.3 Stress and Duration

A stressed syllable is more prominent than an unstressed one, and a bi-moric (i.e. "long") syllable is more prominent than one with one mora (i.e. "short"). For an in-depth discussion of duration (i.e. vowel length) and stress, see 1.2.1 and 1.2.2.

0.4 Dominance Hierarchy

In 0.3.2, we pointed out that, in essence, the tonal rules of Zulu are rules that regulate the occurrence of tonal prominence. The occurrence of tonal prominence is regulated either in terms of penultimate syllable prominence, or, in the case of verbal constructions, in terms of a type of morpheme hierarchy. In 0.3.1 we discussed the effect of penultimate syllable prominence on some tonal rules. In this section we wish to indicate the effect of a type of morpheme hierarchy on the other Zulu tonal rules.

If tonally prominent (i.e. high toned) adjacent morphemes arise in constructions where the two have different ranking in the hierarchy of morphemes, then tonal rules will regulate the tonal prominence according to this hierarchy, i.e. tonal prominence is allowed on the morpheme with higher ranking, but it is removed from the lower ranking morpheme. Similarly, if in a construction, tonal prominence should occur on a morpheme which has lower rank than the following tonally non-prominent morpheme, then, again, tonal rules will regulate the tonal prominence according to the hierarchy of morphemes, i.e. tonal prominence will shift

from the lower ranking morpheme to the higher ranking morpheme. This hierarchy of morphemes we have decided to term the dominance hierarchy. This hierarchy applies in verbal constructions only. Verbal morphemes are hierarchically ordered from left to right, and the dominance hierarchy could be presented as:

prefix < root < suffix

This is to be interpreted as stating that prefixes are lower than roots which are lower than suffixes.

Here are two examples that illustrate how the dominance hierarchy regulates tonal prominence when two tonally prominent morphemes are contiguous:

U.R. [HL uma] # [H e] [H ngen*+a] [a] # # "If he comes in"

S.S. úmà è'ngé:nà (See Subject Prefix Dissimilation, 4.2)

U.R. [L ngi] [H phuz*+a] [HL ee] # [L ka] [H bi] # # "I drank badly"

S.S. ngìphùzê: kà'bí (See Root Tone Dissimilation, 4.4)

The following examples illustrate how the dominance hierarchy regulates tonal prominence by shifting it one position higher.

U.R. [HL uma] # [H be] [L hlek+a] [a] # # "If they are laughing"

S.S. úmà bè'hlé:kà (See Shift to Disyllabic Low, 4.5)

U.R. [L ngi] [H buz*+a] [LL ile] # # "I asked"

S.S. ngìbùzí:lè (See Shift to Disyllabic Low, 4.5)

The dominance hierarchy takes precedence over penultimate syllable prominence. The second verb in the following

example occurs in a construction where SP Dissimilation is blocked from applying (see 4.2) hence the SP high tone is not affected. The high tones affected occur on the penultimate and the final syllable. The dominance hierarchy takes precedence over penultimate syllable prominence and causes the root high tone to dissimilate from the suffix high tone. Thereafter, penultimate syllable prominence causes the lowering of the final high tone.

Examples:

U.R. [L ngi][H *fún+a][a] # [H ba][H *ngén+a][H e] # [LHL masinya] ##

"I want them to come in quickly"

S.S. ngìfúnà 'bángènè màsí:nyà (see Root Tone Dissimilation 4.4 and Phrase Medial Final Tone Lowering, 4.10)

0.5 The Function of Tonal Rules and Conditions

In Chapter 4 we shall present the eleven tonal rules of Zulu, and we shall indicate that there is no doubt about the functional motivation of ten of them. Our evidence is that the tonal rules of Zulu regulate tonal prominence for the following reasons:

1. To maintain the dominance hierarchy,
2. to preserve penultimate syllable prominence,
3. to supply information regarding the tonal class of a root, and
4. to avoid the creation of homophonous forms.

The most important functions of Zulu tonal rules are 1 and 2, which have already been discussed. Now let us consider functions 3 and 4:

3. Supplying information regarding a following root

A high toned syllable immediately preceding the stem, signals a low toned stem, with the converse being true.

This condition sometimes results from the application of the dominance hierarchy.

Examples:

1. ạ̀ká'hlé:kì "He doesn't laugh" <

L		H	L		HL		
(k)ạ	#	ka	hlek+a		i	# #	

2. ạ̀kàlá:lì "He doesn't sleep" <

L		H	H		HL		
(k)ạ	#	ka	lal+a		i	# #	

In the examples above, the tone on the SP /ka/ can supply us with information regarding the tonal class of the root only after the adjustment required by the dominance hierarchy (i.e. then /ká/ signals a low toned root while /kà/ signals a high toned root).

Any conflict between functions 1 and 2 on the one hand, and functions 3 and 4 on the other, is resolved in favour of the former of each pairs.

Examples:

1. úmà è'hlé:kà "If he laughs" <

HL		H	L				
uma	#	e	hlek+a		a	# #	

2. úmà è'lá:là "If he sleeps" <

HL		H	H				
uma	#	e	lal+a		a	# #	

In example 1, the dominance hierarchy conditions tone shift, while in example 2 it conditions dissimilation. The application of the rules results in the creation of homophonous forms which supply no information regarding the tonal class of the root.

However, there is one tonal rule (viz. Low Prefix Tone

Shift, 4.6) whose only function is to supply information regarding the tonal class of a following root.

Examples:

bàyáhlè:kà "They are laughing" < [H ba][L ya][L hlek+a][a] # #

báyàlá:là "They are sleeping" < [H ba][L ya][H* lál+a][a] # #

4. Avoiding the creation of homophonous forms

The creation of homophonous forms is avoided, when possible, by blocking the application of tonal processes which, otherwise, have a very general application. One tonal rule has such a motivation, viz. Lexical Tone Cluster Simplification, 4.8. The Mapping Convention (see 1.3.1) is blocked from applying to (L) HL L morphemes, since the output would be (L) H L, which would then be homophonous with underlying (L) H L morphemes.

Examples:

í'mbû:zì "goat" < [H iN][HLL bhuzi] # #

í'mbùzá:nà "small goat" < [H iN][HLL bhuzi][ana] # # (see 4.8)

í'ngá:dì "garden" < [H iN][HL gadi] # #

í'ngájà:nà "small garden" < [H iN][HL gadi][ana] # #

The majority of the general tonal processes whose application is blocked, are those that would obliterate the distinction between high toned and low toned disyllabic verbs. These, however, we will discuss later when we consider the individual tonal rules and processes.

Let us conclude this section with a general statement on the tonal rules of Zulu. The tonological rules of Zulu (as opposed to low-level phonetic realization rules), are generally not across-the-board rules. The application of most of them is sensitive to various kinds of grammatical information such as mood, tense, conjugation, as well as to phonological structure in some cases. The effect is to restrict the generality of tonal processes, and the exceptions can only be handled by listing.

0.6 Morphemes of Zulu

There are three types of Zulu morphemes:

a. Those comprising segments and tones,
b. those consisting of segments only, and
c. those consisting of tones only.

The second type are generally called 'toneless' morphemes. The Toneless Low Convention, which is part of the Mapping Convention associates all toneless morae with low tones. Toneless morae associated with low tones by the Toneless Low Convention are morae which may have been underlyingly toneless or which may have become toneless in the course of a derivation. A number of suffixal morphemes are toneless e.g. all verbal extensions, all nominal suffixes, and some verbal tense suffixes. In verbal roots, the lexical tone of the root is associated with one mora and any other morae within that root are toneless.

The third type of morphemes viz. 'segmentless' morphemes are few, but they account for most of the 'floating' tones of Zulu. Examples of these morphemes are the imperative morpheme (see 3.8.4). the negative copulative 'floating' tone (see 3.9.0), the 'floating' tone occurring with absolute pronouns, etc. (see 3.2.0).

As far as we are aware, this is the first study of the Zulu language in which each morpheme is assigned underlying

segments and tones, or underlying segments only, or underlying tones only. This assignment of underlying tonal structure to morphemes, we consider a major contribution to the study of the Zulu language. Previous morphological studies of Zulu considered only the segmental matrices of the morphemes under study. The result was that such studies recognized fewer morphemes and morpheme alternants than actually occur in the language. Let us illustrate this point with two suffixes $\begin{bmatrix} HL \\ i \end{bmatrix}$ and $\begin{bmatrix} HLL \\ i \end{bmatrix}$. The first suffix occurs in the Indicative, Principal, Present Tense Negative, while the second suffix occurs in the present negative tenses incorporating negative prefix /nga^{L}/.

Examples:

ąlíchì'chí:mì "It's not overflowing" <

$$\begin{bmatrix} L \\ (k)ą \end{bmatrix} \# \begin{bmatrix} H \\ li \end{bmatrix} \begin{bmatrix} L \\ chichim+a \end{bmatrix} \begin{bmatrix} HL \\ i \end{bmatrix} \# \#$$

ùkúngàchì'chî:mì "Not to overflow" <

$$\begin{bmatrix} H \\ u \end{bmatrix} \begin{bmatrix} L \\ ku \end{bmatrix} \begin{bmatrix} L \\ nga \end{bmatrix} \# \begin{bmatrix} L \\ chichim+a \end{bmatrix} \begin{bmatrix} \hat{HLL} \\ i \end{bmatrix} \# \#$$

lúngàchì'chî:mì "It shouldn't overflow" <

$$\begin{bmatrix} H \\ lu \end{bmatrix} \begin{bmatrix} L \\ nga \end{bmatrix} \# \begin{bmatrix} L \\ chichim+a \end{bmatrix} \begin{bmatrix} \hat{HLL} \\ i \end{bmatrix} \# \#$$

With such lexical entries, we are able to explain the pronunciations in the forms above. Previous studies treated the two suffixes as one viz. /i/, which could offer no explanation of the pronunciations above.

One final point on morphemes concerns our lexical entries for verbal stems. Verbs are assumed to be represented in the lexicon as stems, i.e. as a radical and a suffix. The stems are regarded as basic both with regard to the choice of suffix and the choice of tones. By 'basic' is meant the positive infinitive form, minus the initial vowel, that

will appear in the frame /ạ̀kúkhò _____/. (The basic tones of nouns are also derived in this frame, which was first suggested by Rycroft, 1960). The justification for this form of lexical entry for verbs is that it preserves the morpheme structure conditions of the language, whereas the alternative analysis in which verbs are represented lexically as radicals ending in a consonant does not. It seems correct to us that the lexical entries of a language should be phonologically well-formed. A consequence of this analysis is that the basic stem of a verb will be followed by a conjugational suffix in most derivations. In these cases the segmental part of the basic suffix (i.e. the vowel /a/) is replaced by the appropriate conjugational morpheme. Tonally, this leads to a cluster of tones, viz. the tone of the basic suffix and that of the conjugational morpheme on a single mora. The Mapping Convention (see 1.3.1) simplifies this cluster to a single tone.

0.7 Descriptive Framework

This study of Zulu tonology is essentially descriptive and employs the autosegmental framework, as set out i.a. by Clements and Ford (1979). We have chosen this framework because our data indicated that a system in which tones occur on an independent level of representation from the morae i.e. the tone-bearing units, greatly simplified the description.

CHAPTER 1

1.0 AN OUTLINE OF ZULU PHONOLOGY

1.1.0 Segmental Phonology

1.1.1 The Phonemic Inventory of the Consonants

The segmental phonemes of Zulu have been comprehensively discussed by Louw, Lanham (1960, p.67) and Cope (1966, p.19 and p.25). The consonant system of Zulu includes the following inventory of phonemic segments; common phonetic values are supplied when these are not clear from the symbols used.

	Labial	Dental	Alveolar	Alveolar-Lateral	Alveo-Palatal	Palatal	Velar	Glottal
STOPS:	p'	c[/]	t'	x[//]	q[!]		k'	
	ph	ch[/h]	th	xh[//h]	qh[!h]		kh	
	b[ɓ]	nc[/n]		nx[//n]	nq[!n]		k	
	bh[b]	gc[/ɦ]	d	gx[//ɦ]	gq[!ɦ]		g	
		ngc[/nɦ]		ngx[//nɦ]	ngq[!nɦ]			
FRICATIVES:	f		s	hl[ɬ]		sh[ʃ]		
	v		z	dl[ɮ]				
AFFRICATIVES:						tsh[tʃ]		
						j[dʒ]		
NASALS:	m		n			ɲ	ŋ	
LIQUIDS:				l				
APPROXIMANTS:	w					y[j]		h
								ɦ

1.1.2 Phonological Features

The phonological features that we have chosen for this study of Zulu tonology are the laryngeal features as set out in Halle and Stevens (1971), Anderson (1974) and Stevens (1975). This is how Anderson (1974, pp.301-302) explains these features:

> "[± spread glottis]: Spreading or widening the glottal opening inhibits vocal cord vibration and increases air flow. In consonants, this is associated with voicelessness and especially with aspiration ... Voiceless and breathy voiced vowels are characterized by spread glottis as are /h/ and other voiceless glides. Voiced /ĥ/ is the glide whose laryngeal position corresponds to a voiced aspirate stop: +spread glottis + slack vocal cords].
>
> [± constricted glottis]: An extreme degree of constriction or narrowing of the glottal opening results in glottalized or laryngealized sounds. In consonants, these are ejective, implosive and laryngealized types, in vowels the creaky voiced type and the glottalized vowel ...
>
> [± stiff vocal cords]: By stiffening the vocal cords, their resistance to vibration is increased. In consonants, stiffness is associated with ejective varieties of sound made with constricted glottis; heavily aspirated varieties of sounds made with spread glottis and plain voiceless consonants ...
>
> [± slack vocal cords]: Slacking the vocal cords enhances their ability to maintain vibration under conditions which are otherwise somewhat unfavourable to voicing. With spread glottis, this results in voicing during the period of aspiration noise..."

We have not made an instrumental study of the application of these features to Zulu segments, but we have decided to use them since they satisfy our intuitions and our auditory im-

pressions, and since they also simplify the statement of the tonological rules that are triggered by syllable depression.

Before discussing the phenomenon of syllable depression let us consider the laryngeal feature specifications for Zulu consonants and vowels:

	p'	ph	b	bh	f	v	w	m	c	ch	nc	gc
Spr. glottis	−	+	−	+	+	+	−	−	+	+	−	+
Constr. glottis	+	−	+	−	−	−	−	−	−	−	−	−
Stiff voc. cords	+	+	−	−	+	−	−	−	+	+	−	−
Slack voc. cords	−	−	−	+	−	+	−	−	−	−	−	+

	ngc	t'	th	d	s	z	n	x	xh	nx	gx	ngx
Spr. glottis	+	−	+	+	+	+	−	+	+	−	+	+
Constr. glottis	−	+	−	−	−	−	−	−	−	−	−	−
Stiff voc. cords	−	+	+	−	+	−	−	+	+	−	−	−
Slack voc. cords	+	−	−	+	−	+	−			−	+	+

	hl	dl	l	q	qh	nq	gq	ngq	sh	tsh	j	n
Spr. glottis	+	+	−	+	+	−	+	+	+	−	+	−
Constr. glottis	−	−	−	−	−	−	−	−	−	+	−	−
Stiff voc. cords	+	−	−	+	+	−	−	−	+	+	−	−
Slack voc. cords	−	+	−	−	−	−	+	+	−	−	+	−

	y	k'	kh	k*	g	n	h	ɦ
Spr. glottis	−	−	+	−	+	−	+	+
Constr. glottis	−	+	−	+	−	−	−	−
Stiff voc. cords	−	+	+	−	−	−	+	−
Slack voc. cords	−	−	−	−	+	−	−	+

*/k/ is conventionally described phonetically as a lenis voiced stop. Phonologically it forms a natural class with /b/, hence it receives the same feature specification.

The consonant /r/ is not included here as it occurs only in adoptives.

	i	e	a	o	u
high	+	–	–	–	+
low	–	–	+	–	–
back	–	–	–	+	+
spread glottis	–	–	–	–	–
constr. glottis	–	–	–	–	–
stiff voc. cords	–	–	–	–	–
slack voc. cords	–	–	–	–	–

When occurring with depressor consonants, and also in a few morphemes which will be listed later, these vowels occur with the feature [+ slack vocal cords], and will be written with a cedilla.

There are three classes of consonantal clusters in Zulu:
CW, where C = any obstruent, and W = high back glide
NC, where N = homorganic nasal, and C = any obstruent, excluding a click.
NCW, where N = homorganic nasal, C = any obstruent, excluding a click and W = high back glide.

1.1.3 Syllable Depression

Our interest in the segmental phonology of Zulu centres on the phenomenon of depression which has a great influence on Zulu tonology. Syllable depression is a phenomenon which causes a high tone to be displaced onto the syllable to the immediate right of the depressed syllable (see Tonal Displacement, 4.11), failing which the high tone is realized as an up-gliding high tone (see the Up-Gliding High Tone Rule, 2.2.2). With a low tone, syllable depression blocks its assimilation to a high tone to its right (see 2.2.3, Low Tone Raising Rule). Earlier investigators into Zulu tonology, i.e. Doke, Lanham, Cope, Rycroft, etc. have all attributed depression in the syllable to the presence of "depressor consonants" or

"depressors". In this study we differ slightly by attributing depression to the feature [+ slack vocal cords], whether this is specified in the syllable peak or in the consonant. To us, the difference between /índòdà/ "a man", and /i̱ndòdà/ "It's a man" is best explained in terms of the feature specifications of the initial vowel in each case. In the first example /i/ is [- slack vocal cords], while in the second example /i̱/ is [+ slack vocal cords]. The feature [+ slack vocal cords] typifies segments that are breathy voiced. However, the degree of breathiness in these segments may vary quite considerably. The following consonants form a class of [+ slack vocal cords] consonants which in previous literature have been referred to as depressor consonants: bh; v; gc; ngc; d; z; gx; ngx; dl; gq; ngq; j; g; h.

These are the only segments in Zulu which are always [+ slack vocal cords]. All other segments are [- slack vocal cords]; but the feature [+ slack vocal cords] may be introduced by the Slack Assimilation Rule into the feature specifications of a [- slack vocal cords] segment. Special symbols will be used to indicate the occurrence of the feature [+ slack vocal cords] in segments which are usually [- slack vocal cords]. In a vowel we shall use a subscript cedilla and with a consonant a superscript 'ɦ' will be used.

Slack Assimilation Rule

$$[-\text{ slack}] \rightarrow [+\text{ slack}] \;/\; \left\{ \begin{array}{l} \not{\emptyset} _____ [+\text{ slack}]\ \not{\emptyset} \\ \left[\begin{array}{l} \pm \text{ vocalic} \\ -\text{ obstruent} \end{array} \right] \\ \not{\emptyset}[+\text{ slack}] _____ \not{\emptyset} \end{array} \right\}$$

The effect of this rule is to spread breathiness throughout a syllable, from a [+ slack] segment to a following vowel, or from a vowel to a preceding vowel or /m n l y w/.

Examples:

úmɬ́mà ⟶	ú'mʰɬ́mà	"mother"
únɬ́sì ⟶	ú'nʰɬ́sì	"nurse"
lɬ́thà ⟶	lʰɬ́thà	"bring!"
yɬ́bò ⟶	yʰɬ́bò	"yes!"
wɬ́zà ⟶	wʰɬ́zɬ́	"come!"

Lexically Determined Cases of the Feature [+ slack]

A comprehensive list of lexically determined [+ slack], reveals a miscellaneous class:

1. Morpheme alternants for prefixes in copulative construction

   a. Identificative Copulative (see 3.9.2)

   Examples:

ɮmúntù	"it's a person"	cf. ùmúntù	"person"
ɮ'ŋgánè	"it's a child"	cf. í'ŋgánè	"child"
ɬ́'zámì	"they're mine"	cf. é'zámì	"mine"
ɬ́'múdè	"it's the tall one"	cf. ó'múdè	"a tall one"

   b. Descriptive Copulative (see 3.9.2)

   In the Natal Coast dialect all de-adjectival copulative prefixes. In the KwaZulu dialect only those prefixes of the form nasal + vowel, i.e. classes 1, 3, 4, 6. Another variety of Zulu has the feature [+ slack] on all prefixes except those containing an obstruent.

Natal Coast dialect	KwaZulu dialect	
bɬ́dálà⟶ bɬ́'dálà	bádálà ⟶ bá'dálà	"they are old"
mɮncánè⟶ mʰɮncánè	mɮncánè⟶ mʰɮncánè	"they are small"
lɬ́khúlù⟶lʰɮkhúlù	lúkhúlù⟶lú'khúlù	"it is big"

These examples illustrate both the dialectal distribution of [+ slack] in de-adjectival

copulative prefixes and tonal displacement (vide Tonal Displacement Rule 4.11).

c. Associative Copulative (see 3.9.2)

The associative copulative prefix /nạ̀/ in the positive conjugation.

Examples:

úné̱mɔ́tò → ú'n^{ɦ}é̱'m^{ɦ}ɔ́tò "He has a car"

cf.

ạ̀kánà'm^{ɦ}ɔ́tò "He has no car"

2. Morpheme alternants for certain subject prefixes (see 3.8.2)

First and second person, singular and plural, in principal, positive constructions.

Examples:

a.	ù̱zògèzà	"You will wash"
b.	n^{ɦ}i̱n^{ɦ}èmâ':lí	"You (pl) have some money"
c.	si̱yàhámbà	"We're going"
d.	úmà' úzògèzà	"If you will wash"
e.	ạ̀nínàmà':lí	"You have no money"
f.	w^{ɦ}ɔ́zà'síhà'mbé	"Come, let's go"

The personal subject prefixes in examples a, b and c are [+ slack] because they occur in principal positive constructions while those in d, e and f do not. The prefix in d is in the participial, positive, while the one in e is in the principal, negative, and the one in f is in the subjunctive, positive.

3. Certain Imperatives

a. A few verbal radicals in the imperative construction

lé̱thà →	l^{ɦ}é̱thà	"bring!"	cf.	úkù'léthà "To bring"
mạ́nà →	m^{ɦ}ánà	"stop, stand up!"	cf.	ú'mílè "He stood up"
yạ́nà →	y^{ɦ}ạ́nà	"go!"	cf.	úzòyà "He will go"

copulative prefixes and tonal displacement (vide Tonal Displacement Rule 4.11).

c. Associative Copulative (see 3.9.2)

The associative copulative prefix /nạ̀/ in the positive conjugation.

Examples:

únɛ́mɔ́tò → ú'nʰɛ́'mʰɔ́tò "He has a car"

cf.

ạ̀kánà'mʰɔ́tò "He has no car"

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Examples:

a.	ù̀zòɡèzà	"You will wash"
b.	nʰɨ̀nʰɛ̀mâ':lí	"You (pl) have some money"
c.	sɨ̀yàhámbà	"We're going"
d.	úmà' úzòɡèzà	"If you will wash"
e.	ạ̀nínàmà':lí	"You have no money"
f.	wʰɔ́zà'síhà'mbé	"Come, let's go"

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mɑ́nà →	mʰánà	"stop, stand up!"	cf.	ú'mílè "He stood up"
yɑ́nà →	yʰɑ́nà	"go!"	cf.	úzòyà "He will go"

b. A few morphemes occurring in the imperative construction

mʮsà ⟶	$m^{ɦ}$ʮsà	"Don't!"
mʅnà ⟶	$m^{ɦ}$ʅnà	"Here you are!"
wǫ́zà ⟶	$w^{ɦ}$ǫ́zà	"Come!"
yɻzá ⟶	$y^{ɦ}$ɻzá	"Come!"

4. Some Nouns

Examples:

úmɕ́sì ⟶	ú'$n^{ɦ}$ɕ́sì	"nurse"
úmʅsì ⟶	ú'$m^{ɦ}$ʅsì	"Miss, i.e. female teacher"
î:yɋ́dì ⟶	î':$y^{ɦ}$ɋ́dì	"yard, (measure of length)"

5. Some Interjectives

Examples:

yɕ́bò ⟶	$y^{ɦ}$ɕ́bò	"Yes!"
wǫ́shì ⟶	$w^{ɦ}$ǫ́shì	an interjection of contempt

6. The principal negative prefix /(k)ɐ̀/ and the hortative prefix /(m)ɐ̀/

Examples:

(k)ɐ̀kàfúnì	"He doesn't want to"
($m^{ɦ}$)ɐ̀sídlè	"Let's eat!"

1.2.0 Suprasegmental Phonology

Vowel length, stress and syllable pitch, i.e. tone, have an important phonological function in Zulu. Pitch is the main concern of this thesis, but it is intertwined with the other prosodic features to a degree that requires us to give an analysis of their phonological status. Length is discussed in 1.2.1 below, stress in 1.2.2, intonation in 1.2.3 and tone covers the bulk of the discussion thereafter.

1.2.1 Vowel Length

Underlyingly, all Zulu vowels are short. In surface structures, however, both long and short vowels occur. As we have noted (see 0.3.3) vowel length gives prominence to a syllable and

we shall come back to this a little later. In this analysis, a long vowel is interpreted as a sequence of two identical short vowels, i.e. morae. This interpretation facilitates the description of a number of tonal processes that create clusters of tones and long vowels. These processes are fully illustrated below. Bi-moric syllable peaks are always realized phonetically as long vowels, as a result of the application of the following low-level realization rule:

Long Vowel Realization Rule

$$\begin{matrix} V \\ [\alpha\ \text{high} \\ \beta\ \text{low} \\ \gamma\ \text{back}] \end{matrix} \quad \begin{matrix} V \\ [\alpha\ \text{high} \\ \beta\ \text{low} \\ \gamma\ \text{back}] \end{matrix} \longrightarrow \begin{matrix} V \\ [\alpha\ \text{high} \\ \beta\ \text{low} \\ \gamma\ \text{back} \\ +\ \text{long}] \end{matrix}$$

(Tone realizations in the above rule will be considered a little later).

In most derivations that follow, this rule will not be explicitly stated. It must be pointed out that sequences of like or unlike short vowels occur in adoptives. In this case the vowels are in hiatus, and this is expressed by [ʔ].

Examples:

àmà ʔ ápù:là "apples"
í ʔ à'yí:nì "an iron"

In non-adoptives, bi-moric sequences surface as long vowels. Bi-moric sequences are either lexical or they are derived.

1.2.1.1 Lexical Bi-moric Sequences

The following bi-moric sequences are lexical. Any apparent discrepancies in segmentation between the examples are clarified in Chapter 3.

a. The Remote Past Tense Morpheme /áà/ (see 3.8.2)

Example:

U.R. $\begin{matrix}[H \\ u]\end{matrix}\ \begin{matrix}[HL \\ aa]\end{matrix}\ \#\ \begin{matrix}[L \\ hìek+a]\end{matrix}\ \begin{matrix}[\widehat{HL}\ L \\ a\ \ \ ]\end{matrix}\ \#\#$ "He laughed"

S.S. wâ:hlè':ká

b. <u>The Past Tense Negative Morpheme /ŋgáà/</u>
(see 3.8.2)

Example:

<u>U.R.</u> [L (k)ą] # [H ba] [HL ŋgaa] # [L thukuthel+a] [HL a] # #
"and they did not get angry"

<u>S.S.$_1$</u> ąbâ:thùkù'thé:là

<u>S.S.$_2$</u> ą'báŋgâ:thùkù'thé:là

<u>S.S.$_3$</u> báŋgâ:thùkù'thé:là

c. <u>The Conditional Negative Morpheme /ŋgéè/</u>
(see 3.8.2)

Example:

<u>U.R.</u> [L ką] # [H zi] [HL ŋgee] # [L fik+a] [HL e] # #
"they can't arrive"

<u>S.S.</u> zìŋgê:'fí:kè

d. <u>The Exhortative Subjunctive Morpheme /bóò/</u>
(see 3.8.2)

Example:

<u>U.R.</u> [L mą] # [H ni] [HL boo] # [L shesh+a] # #
"do hurry!"

<u>S.S.$_1$</u> ąnô:shè:shà

<u>S.S.$_2$</u> ąnibô:shè:shà

<u>S.S.$_3$</u> nìbô:shè:shà

e. <u>Third Position Demonstrative Pronoun /làà ... nàà/</u> (see 3.3.1)

The initial and final syllables in this construction are bi-moric.

Example:

U.R. [LL laa][L zi][H ya][LL naa] ## "Those (cl.10) over there!"

S.S.$_1$ lè:zìyánà:

S.S.$_2$ lè:zìyâ:

f. The Locative Copulative Demonstrative Morpheme /nàà/ (see 3.3.2)

Example:

U.R. [HL naa][H ba] ## "Here they are!"

S.S. nâ:'bá

g. The Independent Possessive Morpheme /éè ~ áà ~ óò/ (see 3.9.3)

Example:

U.R. [HL ee][L li][L a] #([H mi]) ## "mine"

S.S. ê':lá:mì

h. The Relative Morpheme /àá/(see 3.5.0)

Example:

U.R. [H u][L mu][L ntu] # [LH aa]#[H u][L zo]#[L ku][L fik+a]##

"The person who will a rive"

S.S. ùmúntù' ó:zòfì:kà

i. The Noun Class 2(b) Prefix /óò/(see 3.1.1)

Example:

U.R. [HL oo][HL nẹsi] ## "nurses"

S.S. ô:'n^{ɦ}é:sì

j. The Past/Stative Morpheme /éè/(see 3.8.3)

Example:

U.R. [H u][L gez+a][HL ee] # [L ni][H ni] ##

"When did he wash?"

S.S. úgè'zê: nì:'ní

k. The Contracted Future Morpheme /òò/(see 3.8.3)

Example:

U.R. [H ba][LL oo] # [H *hamb+a] ## "They'll go"

S.S. bô:'há:mbà

l. The Participial Si curring with Copulatives (see 3.8.2)

Example:

U.R. [HL uma] # [HL bee][L nǫ] # [H i][LH mali] ##

"If they have some money"

S.S. úmà'bê:nʱè'mâ:'lí

m. The Morpheme Alternant /séè/ in Copulative Constructions (see 3.9.0)

Example:

U.R. [H u][HL see] # [L mu][H hle] ## "She is still pretty"

S.S. ùsê:mù'hlé

n. Some Interjections, Conjunctions and Ideophones

(i) Interjections

Example:

U.R. [LHLL eɦeene] ## "Yes!"

S.S.$_1$ èɦê:nè

S.S.$_2$ èɦê:

(ii) Conjunctions

Example:

U.R. [HL nxaa] # "if, when"

S.S. xê:

(iii) Ideophones

Example:

U.R. [HL zwii] # "description of unit; or description of flinging"

S.S. zwî:

(Regarding this last example, it is interesting to note that while Doke (1948) gives the following forms identical tonal patterns, yet he spells them differently, doubling the vowel of the second form:

"zwi(8-3-8) ... of a unit; of being alone; solitary; only one ...
zwii(8-3-8) ... of flinging, whirling, swinging ..."
(Doke 1948 : 902)

While Doke does not normally indicate vowel length, in this case he states that "since monosyllabic ideophones are often distinguished by the length of vowel, ideophones with abnormally long vowels are indicated by a doubling of such vowel." (Doke, 1948 : X).

We are in agreement with Doke that both ideophones have long vowels, and that each carries the high-low tone cluster ("8-3-8" is

Doke's representation of a high-low tone cluster occurring on a [+ slack] syllable). We also agree that phonetically the second ideophone is longer than the first. But this is a phonetic difference not a phonological one. Both ideophones contain a bi-moric sequence with a high-low tone sequence).

1.2.1.2 Derived Bi-moric Sequences

Two processes create bi-moric sequences:

a. The application of the Penultimate Mora Creation Rule, resulting in the vowel length generally referred to as "syntactical length", demarcating a breath-group, and,

b. The removal of an intervocalic consonant.

a. The Application of Penultimate Mora Creation

Bi-moric sequences occurring on the penultimate syllable of a phrase final word are the result of the application of the following rule:

Penultimate Mora Creation

$$\emptyset \longrightarrow V \begin{bmatrix} \propto \text{high} \\ \beta \text{ low} \\ \gamma \text{ back} \end{bmatrix} \Big/ \#\# \ldots\ldots\ldots \emptyset(C)V - \emptyset CV \ \#\# \begin{bmatrix} \propto \text{high} \\ \beta \text{ low} \\ \gamma \text{ back} \end{bmatrix}$$

Condition: The penultimate syllable must contain the feature [+ prominence].

This rule demarcates a breath-group, traditionally referred to as a phonological phrase, by adding a second mora to the syllable in the phrase final word that has penultimate syllable prominence. (see 0.3.1)

The following tonal rule applies after Penultimate Mora Creation:

Tone Epenthesis

$\emptyset \longrightarrow -\propto H \;/\; \$ \beta H ____ \$ \propto H \;\#\#$

Condition: A resulting LH is converted to LL.

Informally, this rule states that a toneless second mora within a syllable is supplied with a tone dissimilar to the succeeding tone. Where this yields the disallowed LH tone cluster, it surfaces as LL.

Examples:

H	L	HL
a	ba	fana

\#\# "boys"

> abafaana Penultimate Mora Creation
> H L HH L Tone Epenthesis
> ábà'fá:nà

In the following examples Penultimate Mora Creation does not apply because the penultimate syllable of the phrase-final word lacks penultimate syllable prominence. In the first example penultimate syllable prominence is precluded by vowel length in the final syllable, and in the second example by stress in one syllable of the word:

L		H	HL
ŋga	#	u	dlii

\#\# "forcefully"

> H HL vide Mapping Convention, 1.3.1
> ŋgó'dlî:

H	L		HLH
u	th+i	#	ntinini

\#\# "He runs fast"

> úthì ' ntínìnî

The motivation for adding a mora in the rule above is simply that the domain of a tone is a mora in Zulu, and a sequence of two tones such as HL, which may arise on phrase final penultimate syllables therefore requires a bi-moric syllable peak.

Example:

[H]	[L]	[LL]		
[i]	[zi]	[hlalo]	##	"chairs"

>	LHLL	vide Low Prefix Tone Shift, 4.6
>	izihlaalo	Penultimate Mora Creation
>	LHLLL	Tone Epenthesis
>	LLHLL	vide Tonal Displacement, 4.11
>	ìzìhlâ:lò	

b. <u>The removal of an intervocalic consonant</u>

In the following examples we have evidence to indicate the removal by deletion or metathesis of a consonant from an intervocalic position. Such a consonant is removed with the boundary to its immediate left.

(i) <u>The Noun Prefixes</u> /ii; iɟ; uu/ (see 3.1.1)

Example:

[H]	[L]	[HL]		
[i]	[zi]	[ŋgane]	##	"children"

>	izɟŋgɟane	Slack Assimilation
>	iɟŋgɟane	Consonant Deletion
>	ɟɟŋgɟane	Slack Assimilation
>	ɟɟŋgɟɟanè	Penultimate Mora Creation
>	HLHHL	Tone Epenthesis
>	ɟ̂:'ŋgá:nè	

In the example above, the surface realization /ɟ̂:'ŋgá:nè/ is an alternate of the more usual /ízì'ŋgá:nè/.

[H]	[L]	[H]		
[i]	[liɟ]	[zwi]	##	"voice"

> iizwi Consonant Deletion
> î:'zwí

[H][L][H]
[u][lu][thi] # # "stick, twig

> uuthi Consonant Deletion
> û:'thí

In the speech of some Zulus the forms /úlù'thí/ and /ílì'zwí/ occur, where the Consonant Deletion Rule is blocked by the occurrence of monosyllabic noun roots.

(ii) <u>The Copulative Prefixes /l^{ɦ}ụ:, sụ:, zụ:, l^{ɦ}u:, bu:, ku:/</u> (see 3.9.2)

Example:

[H][L][H]
[ụ][ku][phúz+a] # # "It is drinking"

> HLHL vide Mapping Convention, 1.3.1
> kụuphuza Metathesis
> kụụphuza Slack Assimilation
> kụụphuuza Penultimate Mora Creation
> HLHHL Tone Epenthesis Rule
> kû:'phú:zà

(iii) <u>Some Unrelated Lexical Items</u>

Alternative surface realizations in which Consonant Deletion has taken place occur within a miscellaneous class of morphemes.

Examples:

[H][HL]
[u][mąma] # # "mother"

> um^{ɦ}ąma Slack Assimilation Rule
> um^{ɦ}ąa Consonant Deletion
> um^{ɦ}ąą Slack Assimilation Rule
> ú'm^{ɦ}ą̂:

The variant /ú'm^{ɦ}ą̂:/ is used as a term of

endearment for one's real mother, in place of the more neutral /ú'mⁿámà/. Because of the semantic shift it cannot be regarded synchronically as deriving from the longer form.

It is necessary at this point to anticipate an objection to the formalization of vowel length as a bi-moric sequence of like vowels. It may be objected that Zulu is a language in which clusters of vowels are disallowed, and indeed there are a number of rules that resolve vowel sequences that arise in the course of certain derivations, such as Consonantalization, Assimilation and Vowel Deletion. However, vowel sequences subject to these rules form a well-defined class relative to the vowel sequences that are interpreted as bi-moric. The latter are not only syllable internal but also morpheme internal, whereas the former straddle a morpheme boundary. Furthermore one class of derived bi-moric sequences has the unique property of arising through Consonant Deletion, which is never the case with the former. This suggests the following revision of the traditional claim concerning vowel sequences in Zulu: that Zulu disallows vowel sequences at morpheme boundaries, but tolerates (in some cases indeed creates) sequences of like vowels within morphemes.

In concluding this discussion on vowel length we would like to point out that most bi-moric sequences associated with like tones surface as short vowels as a result of the optional application of the following low-level Vowel Shortening Rule:

The Vowel Shortening Rule (optional)

$$\begin{bmatrix} \alpha H \\ V \end{bmatrix} \longrightarrow \emptyset \;/\; \not{\emptyset} \begin{bmatrix} \alpha H \\ V \end{bmatrix} ____ \not{\emptyset}$$

Conditions:

1. The rule may not apply to the output of the Penultimate Mora Creation Rule since it would remove the length that demarcates a phonological phrase.
2. It may also not apply to bi-moric plural noun prefixes resulting from the deletion of an intervocalic consonant since this would obliterate the distinction between singular and plural prefixes.

The rule states that the second of two vowels associated with like tones and occurring within the same syllable, optionally deletes. (Actually, the decision to delete the second vowel rather than the first is arbitrary).

Example:

$$\begin{bmatrix} H \\ iN \end{bmatrix}\begin{bmatrix} L \\ dlu \end{bmatrix} \# \begin{bmatrix} LH \\ aa \end{bmatrix} \# \begin{bmatrix} H \\ i \end{bmatrix}\begin{bmatrix} L \\ z+a \end{bmatrix} \# \begin{bmatrix} L \\ ku \end{bmatrix}\begin{bmatrix} L \\ w+a \end{bmatrix} \# \#$$

"The house which will collapse"

>	indlu	ee+i+za+ku+wa	Vowel Assimilation Rule
>	indlu	eezakuwa	vide Vowel SP Deletion, 3.5.0
>	HL HHLLL		vide Mapping Convention, 1.3.1
>	indlu	eezakuuwa	Penultimate Mora Creation Rule
>	HL HHLLLL		Tone Epenthesis Rule

> indlu ezakuuwa Vowel Shortening Rule
> índlù'ézàkù:wà

The surface realization /ézàkù:wà/ is the variant of the more commonly used forms /é:zò:wà/ and /ézò:wà/. An additional form with the long vowel i.e. /é:zàkù:wà/ also occurs.

It is worth noting that a high tone associated with a mora occurring in a bi-moric syllable peak cannot be shifted from that mora by any rule.

Examples:

ô:dòkòtèlà "doctors" cf. ùdòkótèlà "doctor"

nô:bà'bá "and our fathers" cf. nòbâ:'bá "and father"

njé'ŋgó:lwà:yó "like the one who is fighting" cf. njéŋgòmû:thí "like medicine"

1.2.2 Stress [=]

When one syllable within a Zulu word has prominence through increased loudness, or greater intensity (see 0.3.3) such a syllable is said to be stressed. Like vowel length, stress in Zulu is either lexical or it is derived.

a. Lexical Stress

Lexical stress resides in the initial syllables of the morphemes to be listed below. In demonstratives and ideophones stress has an ostensive function, serving to focus attention on the first demonstrative position, or on the action or state indicated by the ideophone.

(i) First Position Demonstratives

Examples:

ló # "This one" (cl. 1 or 3)
lésì # "This one" (cl. 7)
láphà # "Here"

(ii) Ideophones

Examples:

Ideophone	Depicting
dú #	"quietness, stillness"
thùshù #	"sudden appearance"
ntínìní #	"fast running"
gìlìkìdì/gílìkìdì #	"falling down"

(iii) Prominence in the form of both stress and length is a distinctive mark of the phrase-medial form of the suffix of the Past/Stative tense.

Example:

[L ŋgi][H* dí+a][HL ee] # [H iN][LL ɲama] # # "I ate some meat"

> ŋgìdlêː'ɲàːmà

b. Derived Stress

Occurrences of derived stress are very rare in Zulu. In Question Intonation, the penultimate syllable of a phrase final word acquires stress when the final syllable deletes in emphatic forms.

Examples:

ụyàbó	"You see?"	<	[L ụ][L ya][H* bon+a][a]	# # ?
ùbà	"Who?"	<	[L u][LH bani]	# # ?

Stress, as we indicated earlier, blocks all forms of tone shift. In the example below, Tonal Displacement is

blocked by stress from applying to the first syllable of the second word:

ùkúthì gílìkìdì "To fall down"

In the absence of [+ stress] the high tone on a [+ slack] syllable like /gi/ would be displaced to the following syllable.

Example:

úmà ègì'nqî:kà "If he rolls over" <

[HL uma] # [H e][L ginqik...] ##

In the example above, Ante-Penultimate Tone Shift, 4.7 shifted the high tone from the SP /e/ to the stem ante-penultimate syllable i.e. /gi/, and then Tonal Displacement, 4.11 further shifted it to /nqi/.

1.2.3 Intonation

In this analysis intonation is not given systematic status, it is only treated phonetically. The two intonations which have tonological relevance are:

a. Statement intonation /!/, and
b. Question intonation /?/.

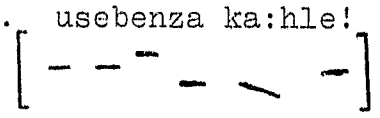
The constituents of intonation are:

1. Key

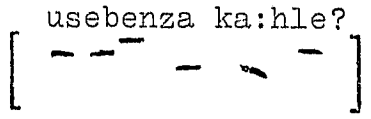
   Statement intonation is unmarked for key (i.e. it is at "average" speaking key), while question intonation is at a much higher key.

   Examples:

   a. usebenza ka:hle! "He works well"

   b. usebenza ka:hle? "Does he work well?"

2. Tempo

Statement intonation is unmarked for tempo (i.e. it is at "average" speaking tempo), while question intonation is at a much faster tempo. Example b. above is spoken at a much faster tempo than example a.

3. Tonal Phenomena

In statement intonation the tone on the final syllable of the phonological phrase is lowered (the phonetic realization rule governing this tonal change is set out in 2.2.1). This lowered final tone does not occur in question intonation (see the examples under "key").

Stress and Intonation

As we pointed out in 1.2.2, in question intonation, the penultimate syllable of a phrase final word acquires stress when the final syllable deletes in emphatic forms.

Examples:

ụyàbó̲ "You see?" < [L ụ][L ya][H bon+a*][a] # # ?

ùbà̲ "Who?" < [L u][LH bani] # # ?

1.7 The Tones of Zulu

Zulu has three phonological tones, a high tone (H), a low tone (L), and a high-low tone cluster (H$\hat{L}$). Tones and morae have a one-to-one association, and for its realization as a falling glide, the H$\hat{L}$ tone must be associated with a bi-moric sequence (i.e. a long vowel); but in phrase medial position the association of H$\hat{L}$ is effected according to Rule 4.8.

Examples:

[H a][L ma][HL ɦashi] # # "horses"

> ámà'ɦáshì

[H i][L si][ĤLL zungu] ≠ ≠ "loneliness'

> isizuungu Penultimate Mora Creation

> ísì'zû:ngù

There are two types of tone clusters in Zulu, viz. lexical and derived tone clusters.

Lexical Tone Clusters

As we indicated above, there is only one lexical tone cluster, viz. the high-low tone cluster Ĥl. This tone cluster occurs with many morphemes:

1. Nouns (see 3.1.2)

U.R. [H a][L ma][ĤL L khaya] # # "homes"

S.S. ámà'khâ:yà

2. Possessive Pronouns (see 3.2.0)

U.R. [H iN][L dlu][L ya] # ([ĤL] [L bo]) # # "their house"

S.S. índlù'yà:bò

3. Adjective/Relative Stems (see 3.4.0 and 3.5.0)

U.R. [LH aa][H li][LĤL mhlophe] # # "a white one"

S.S. é:'límì'hlô:phè

4. Verbs (see 3.8.1)

U.R. [HL uma] # [H e][ĤL *fun+a][a] # # "If he wants to"

S.S. úmà è'fû:nà

5. Certain Suffixes

e.g. the conjugational suffix in remote past tenses (see 3.8.3)

U.R. $\begin{bmatrix} H \\ u \end{bmatrix}\begin{bmatrix} HL \\ aa \end{bmatrix} \# \begin{bmatrix} L \\ hlakaniph+a \end{bmatrix}\begin{bmatrix} \widehat{HLL} \\ a \end{bmatrix} \#\#$ "It was wise of you"

S.S. wâhlàkà'nî:phà

Notice that tone clusters arise from two situations in the lexicon, viz. bi-moric sequences that become associated with H and L, and short vowels that become associated with $\widehat{HL}$ (see the example above). In the former case, the tonal cluster always surfaces since it is associated with the bi-moric sequence necessary for its realization. In the latter case, however, the tone cluster surfaces only if the short vowel it is associated with is converted into a bi-moric sequence in the course of the derivation. We must assume that rules that would simplify this tone cluster (i.e. the Mapping Convention, discussed in 1.3.1, which would associate only one of the two tones in Hl with the short vowel, apply after the Penultimate Mora Creation Rule has applied, which supplies the short vowel with the second mora, or after a special Lexical Tone Cluster Simplification Rule has applied.

Examples:

$\begin{bmatrix} H \\ i \end{bmatrix}\begin{bmatrix} L \\ ziN \end{bmatrix}\begin{bmatrix} \widehat{HLL} \\ bhuzi \end{bmatrix} \#\#$ "goats"

> izimbuuzi Penultimate Mora Creation
> ízì'mbû:zì

$\begin{bmatrix} H \\ i \end{bmatrix}\begin{bmatrix} L \\ ziN \end{bmatrix}\begin{bmatrix} \widehat{HLL} \\ bhuzi \end{bmatrix} - \begin{bmatrix} L \\ zi \end{bmatrix}\begin{bmatrix} L \\ a \end{bmatrix} \#\left(\begin{bmatrix} H \\ \end{bmatrix}\begin{bmatrix} L \\ mi \end{bmatrix}\right) \#\#$ "my goats"

> HLLHLLHL vide Lexical Tone Cluster Simplification, 4.8
> HLLHHL vide Mapping Convention, 1.3.1
> ízìmbù'zí'zámì

Derived Tone Clusters

Derived bi-moric sequences in Zulu, become associated with any of the following tone sequences: HH, LL, LH and HL. As a result of the application of the Long Vowel Realization Rule ØHHØ and ØLLØ are realized as long ØHØ and long ØLØ

respectively. As we saw in 1.2.1 any ⸗LH⸗ sequence resulting from the application of the Tone Epenthesis Rule is converted to ⸗LL⸗. The tone sequence LH on contiguous morae is disallowed in Zulu, consequently any other (contiguous) bi-moric LH tone sequences that arise in the course of a derivation are converted to HH.

The Low Tone Conversion Condition

L ⟶ H / ⸗ ___ H⸗

Example:

H	L	LH		
u	lu	phaphe	##	"feather"

>	LHLH	vide Low Prefix Tone Shift, 4.6
>	uuphaphe	Consonant Deletion
>	HHLH	Low Tone Conversion Condition
>	uuphaaphe	Penultimate Mora Creation
>	HHLLH	Tone Epenthesis
>	ú:phà:phé	

The position of the bi-moric tone sequences HH, LL and LH can be summed up as follows:

⸗HH⸗ ⟶ ⸗H⸗
⸗LL⸗ ⟶ ⸗L⸗
⸗LH⸗ ⟶ ⸗HH⸗ ⟶ ⸗H⸗

The only bi-moric tone sequence that surfaces, therefore, is H̋L. Derived high-low tone clusters result from the application of three rules:

a. Consonant Deletion

Example:

H	L	HL		
i	li	ʃashi	##	"horse"

>	iiʃashi	Consonant Deletion
>	iiʃaashi	Penultimate Mora Creation

> HLHHL Tone Epenthesis
> î:ɦą́:shì

b. Tonal Displacement

Example:

[H i][L zi][LL hlahla] # # "trees" cf. ìsíhlà:hlà "tree"

> LHLL vide Low Prefix Tone Shift, 4.6
> izihlaahla Penultimate Mora Creation
> LHLLL Tone Epenthesis Rule
> LLHLL vide Tonal Displacement, 4.11
> ìzìhlâ:hlà

c. Tone Epenthesis

Example:

[L (k)ą] # [L ka][HL ngcono][H] # #

> LLHH vide Mapping Convention, 1.3.1
> ąkangcoono Penultimate Mora Creation
> LLHLH Tone Epenthesis
> ąkàngcô:'nó

(The suffixal 'floating' tone in the above example is the negative high tone in copulative construction, see 3.9.0).

In this section we have only considered the phonological tones of Zulu and the tone clusters occurring in the language. The surface tones of Zulu together with the phonetic realization rules that account for them will be the subject of chapter 2.

1.3.1 The Mapping Convention

When morphemes are brought together in the formation of words, a non-synchrony of tones and morae sometimes arises i.e. sometimes there are more morae than tones, and at other times there are more tones than morae. More morae than tones

is caused by the occurrence of toneless syllables. All toneless syllables, excluding the second mora of the penultimate phrase final syllable (which, as we have already seen, is supplied with a tone by the Tone Epenthesis Rule) are associated with low tones according to the Toneless Low Convention, which is considered part of the Mapping Convention.

Example:

[H / iN][L / dlu][ana] ## " a despicable little house"

> HLL Mapping Convention (i.e. Toneless Low Convention)
> índlwà:nà

With low verbs, the lexical low tone is associated with the left most mora; all other morae get associated with low tones by convention.

Example:

[H / ba][L / zo] # [L / gijim+a] ## "They will run"

> HLLLL Mapping Convention
> bázògìjì:mà

With high verbs, associate H or $\widehat{HL}$ with the designated mora (i.e. the asterisked mora in this study) and any other morae of the verbal stem are associated with low tones by convention

Examples:

[H / u][L / zo] # [H / seb*énz+a] ## "He'll work"

> HLLHL Mapping Convention
> úzòsè'bé:nzà

[H / u][L / ku][$\widehat{HL}$ / dla*l+a][a] ## "To play, playing" (KwaZulu dialect)

> HLHL̂L Mapping Convention
> úkù'dlâ:là Penultimate Mora Creation etc.

The second type of nonsynchrony, viz. where more tones than morae occur, is, usually, the result of the application of segmental rules which convert the morae of certain morphemes in the word into non-tone bearing segments. Some of those rules are Vowel Deletion and Consonantalization. This type of nonsynchrony is resolved as follows:

If a tone loses the mora it is associated with, then associate it with the mora nearest to it (i.e. a mora that is contiguous to it). Of the resultant tone cluster, associate the mora with a high tone and delete all other tones or in the absence of a high tone, associate the mora with one low tone and delete all other low tones.

Examples:

L	H			H	L	
ŋgi	*akh+a	a	#	iN	dlu	##

"I'm building a house"

> HLFL Mapping Convention
> ŋgákhà'í:ndlù

L	L			L	H	
ŋgi	oph+a	a	#	ka	bi	##

"I'm bleeding profusely"

> LLLH Mapping Convention
> ŋgòphà kà:bí

H	L			H	
u	enz+a	a	#	ni	##

"What is he doing?"

> HLH Mapping Convention
> wénzà:'ní

Notice that a number of steps in the Mapping Convention are just not stated, in other words we assume that the reader understands that the steps apply even though they are not explicitly stated. In the above example, for instance, a

complete derivation would be:

[H][L][ ][ ] # [H] # # "What is he doing?"
u enz+a ą ni

> HLLLH Mapp' g Convention (i.e. Toneless Low Convention)
> wenzani Consonantalization and Suffix Replacement
> HLH Mapping Convention
> wenzaani Word Boundary Removal and Penultimate Mora Creation
> HLLH Tone Epenthesis
> wénzà:'ní Long Vowel Realization

As we indicated in 1.3.0 the Mapping Convention is blocked from applying to lexical tone clusters until either the Penultimate Mora Creation Rule has applied or until the Lexical Tone Cluster Simplification Rule has applied. Examples were supplied in 1.3.0.

One final point concerns the mapping of the tones of suffixal morphemes which have two tones associated with one mora. These behave like so-called discontinuous morphemes: if the stem contains two or more morae, then the left-most tone of the suffix is mapped onto the penultimate mora of the stem, while the next tone is mapped onto the final mora of the stem. If the stem contains one mora then the left-most tone is associated with that mora; the unassociated tone deletes. The left-most tone may be a lexical tone cluster. In that case it gets associated with the mora and the unassociated tone deletes.

Examples:

[L][H][L][HL] # # "We are not singing"
(k)ą si hlabelel+a i

> LHLLHL Mapping Convention
> ąsíhlàbè'lé:lì

$\begin{bmatrix}L\\(k)ą\end{bmatrix}$ # $\begin{bmatrix}H\\si\end{bmatrix}\begin{bmatrix}L\\ka\end{bmatrix}$ # $\begin{bmatrix}L\\hlabelel+a\end{bmatrix}\begin{bmatrix}\widehat{HL}L\\i\end{bmatrix}$ ## "We have not yet sung"

> LHLLLH$\widehat{\text{LL}}$ Mapping Convention
> àsíkàhlàbè'lê:lì

In the first example the H on the penult is the H of the suffix and similarly in the second example, the $\widehat{HL}$ on the penult is the $\widehat{HL}$ of the suffix.

$\begin{bmatrix}L\\(k)ą\end{bmatrix}$ # $\begin{bmatrix}H\\ba\end{bmatrix}\begin{bmatrix}L\\ka\end{bmatrix}$ # $\begin{bmatrix}L\\lw+a\end{bmatrix}\begin{bmatrix}\widehat{HL}L\\i\end{bmatrix}$ ## "They have not yet fought"

> LHLH Mapping Convention
> ąbákà!lwí

Note that the left-most tone of a suffix with two tones associates with an OP occurring with a monosyllabic verb in the next example.

Example:

$\begin{bmatrix}L\\(k)ą\end{bmatrix}$ # $\begin{bmatrix}H\\ka\end{bmatrix}\begin{bmatrix}L\\ka\end{bmatrix}$ # $\begin{bmatrix}H\\yi\end{bmatrix}\begin{bmatrix}H\\dl+a\end{bmatrix}^{*}\begin{bmatrix}\widehat{HL}L\\i\end{bmatrix}$ ## "He has not yet eaten it"

> LHLHLH$\widehat{\text{LL}}$ vide Monosyllabic Verb Tone Lowering, 4.1
> LHLH$\widehat{\text{LL}}$ Mapping Convention
> ąkákà'yî:dìì

In order to preserve the distinction between high and low disyllabic verbs, the first tones of the suffixes $\begin{bmatrix}\widehat{HL}L\\i\end{bmatrix}$ and [HL] may not be associated with the penultimate mora of $\underset{L}{C\overline{V}}C+V$ verbal stems, but must be associated with the final syllable, and the unassociated low tone deletes.

Examples:

$\begin{bmatrix}H\\ni\end{bmatrix}\begin{bmatrix}L\\ŋga\end{bmatrix}$ # $\begin{bmatrix}L\\hlek+a\end{bmatrix}\begin{bmatrix}\widehat{HL}L\\i\end{bmatrix}$ ## "Don't laugh"

> HLLH Mapping Convention
> níŋgàhlè:kí
*> níŋgàhlê:kì

L		HL
gob+a	a	

"Bend down!"

> LH Mapping Convention
> gò:bá
*> gó:bà

CHAPTER 2

2.0 SURFACE TONES AND PHONETIC REALIZATION RULES

We have three objectives for this chapter:

a. To identify and describe the surface tones of Zulu,
b. To formulate the rules that account for them, and
c. To discuss the tonological processes that underlie such rules.

A discussion of the surface tones of Zulu will also afford us an opportunity of reviewing some of the literature on the 'allotones' of Zulu.

2.1 The Surface Tones of Zulu

Zulu has twelve surface tones:

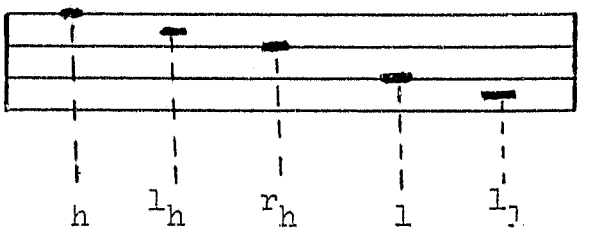
1. An unlowered-level-high tone
2. A lowered-level-high tone
3. An unlowered-upgliding-high tone
4. A lowered-upgliding-high tone
5. An unraised-unlowered-level-low tone
6. A raised-level-low tone
7. A lowered-level-low tone
8. An unraised-downgliding-low tone
9. A raised-downgliding-low tone
10. A high+unraised-downgliding-low falling tone
11. A high+raised-downgliding-low falling tone
12. An upgliding-high+unraised-downgliding-low falling tone

We have chosen to use the term 'glide' to describe low-level contour tones i.e. 'rising' and 'falling' single tones while the term 'fall' is reserved for the 'compound' tone consisting of the high-low tone cluster on a bi-moric sequence.

In this analysis surface tones are represented in the two ways indicated below: either by pitch marks which reflect the relative pitch levels and contours, or by the letters (l) and (h) with superscript letters indicating their phonetic modifications.

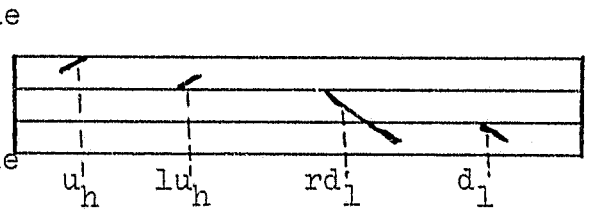
Level Tones

h = unlowered level high tone
^{l}h = lowered level high tone
^{r}l = raised level low tone
l = unraised level low tone
^{l}l = lowered level low tone



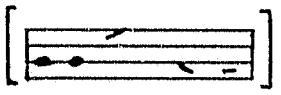
Glides

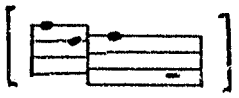
^{u}h = unlowered up-gliding high tone
^{lu}h = lowered up-gliding high tone
^{rd}l = raised down-gliding low tone
^{d}l = unraised down-gliding low tone

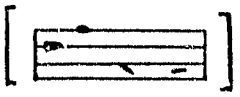


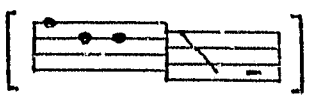
(The tonal stepping phenomenon caused by downdrift will be discussed at 2.5. The symbol " ' " used in these and other examples indicates the boundary of a tonal step).

Examples:

amazàmba:ne !

or amazamba:ne ! "potatoes"
l $l^{u}h$ ^{d}l:^{l}l

abafa:na !

or abafa:na ! "boys"
$h^{r}l$ 'h:^{l}l

ukuge:za !

or ukuge:za ! "washing, to wash"
^{r}l $h^{d}l$: l

uma etha:nda !

or uma etha:nda ! "If he wants to"
$h^{r}l^{r}l$ ' $\hat{hl}$:^{l}l

The four lines representing pitch levels are left out in most surface tone representations, e.g.

amazamba:ne ! "potatoes"

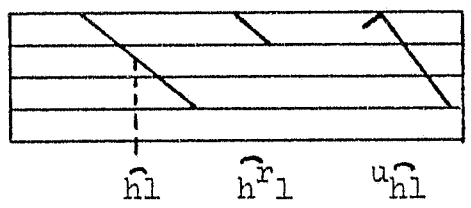
abafa:na ! "boys"

ukuge:za ! "washing, to wash"

uma etha:nda ! "If he wants to"

Tone Clusters

$\widehat{hl}$ = high + low falling tone
$h\widehat{^{r}l}$ = high + raised falling tone
$u\widehat{hl}$ = upgliding high + low falling tone



2.2 Phonetic Realization Rules

Phonetic Realization Rules are low-level rules which, at the end of the phonological component, convert phonological tones into surface tones. Six tonological processes account for this conversion:

a. Intonational Final Tone Lowering
b. Upglide Formation
c. Tonal assimilation
d. Downglide Formation
e. Tone Cluster Formation
f. Tonal Downstep

These processes will be reviewed as we discuss the phonetic realization rules they underlie.

2.2.1 The Lowered Final Tone Rule

$$T \longrightarrow {}^{l}T \;/\; ____ \;!\; \#\#$$

where T = l or h

This rule states that the phrase-final tone in statement intonation is realised much lower than any other like tone in that phrase. The rule accounts for all the lowering in the 'lowered' surface tones i.e. the lowered-level-high tone, the lowered up-gliding high tone, and the lowered level-low-tone. This lowered tone is the tonal manifestation of statement intonation referred to earlier as Intonational Final Tone Lowering.

Examples:

```
h  l  h
imbo:bo  :  ##   "hole"
[  \  -  ]

h  l  l
indo:da  !  ##   "man"
[  \  _  ]
```

Investigators into Zulu tone who have made notable contributions are Cope (1959) and (1966), Lanham (1960) and Rycroft (1960) and (1963). While they did not formulate any tone rules, yet they discussed the different surface tones in depth. They all three describe this lowered tone fairly accurately, but the most satisfactory description is Cope's, which reads:

"the lowered high level tone on ultimate non-depressor syllables or the lowered rising high tone in ultimate depressor syllables in final cadence" and "the extra low level tone in all ultimate syllables in final cadence" (Cope 1966: 72).

2.2.2 <u>The Upgliding-High Tone Rule</u>

$$h \rightarrow {}^{u}h \;/\; \underset{\substack{V \\ [+\text{ slack}]}}{___}$$

The onset of a high tone coarticulated with a [+ slack]

segment is lowered and the tone is realized as an upgliding high tone. This rule is responsible for the formation of the upglide in the following surface tones: the unlowered upgliding-high tone, the lowered upgliding-high tone, and the upgliding-high-low falling tone.

As we indicated in 1.1.3, the incompatibility of the feature [+ slack] and the high tone is resolved by tonal displacement, which moves the high tone away from a [+ slack] syllable. But at times this is not possible (see Tonal Displacement Rule, 4.11), and on such occasions the high tone surfaces as an upgliding-high tone.

Examples:

h l l
1. i̱:phu:pho ! ## "it's a dream"
[ˊ ˋ ˍ]

h l
2. nge:na ! ## "Come in!"
[ˊ ˍ]

h l l
3. si̱:lo:nda ! ## "it's the wound"
[ˊ ˋ ˍ]

h l l
4. zi:lo:nda ! ## "it's the wounds"
[ˊ ˋ ˍ]

The influence of segments on tone has been widely disdussed in the literature on tone. "The major fact that emerges from the study of tone-segment interactions is that it is virtually always segments which influence tone; tone rarely, if ever, influences segments." (Schuh, 1978: 224).

Most of the studies on the influence of segments on tones concern the influence of consonants on tone.

Our claim for Zulu is that all [+ slack] segments i.e. consonants and vowels, have a similar influence on tone, viz. they either cause tonal displacement or they condition upgliding-high tones. In examples 1 and 3 above, the [+ slack] quality in the initial syllables is the feature specified for the vowels only (hence the cedilla marking) while in examples 2 and 4, it is the feature specified for the consonants, and it spreads onto the vowels. The tone-lowering effect of some segments in Nguni languages is well attested. "In Ndebele, breathy voiced consonants pattern out with voiced obstruents in lowering the pitch on the following vowels ..." (Hombert, 1978: 90).

What are the views of previous investigators on the upgliding-high tone? Rycroft declares: "If a syllable commences with a 'low' consonant (i.e. [+ slack] consonant, JMK), then:

i) H commences with a brief rising on-glide and is realized at slightly lower pitch than is the case after a 'neutral' (i.e. [- slack] JMK) consonant." (Rycroft, 1966: 67).

We are in full agreement with Rycroft here, the only addition we make is that our [+ slack] segments include vowels.

Examples:

ɨnga:ne ! "it's a child"
[´ ´ _]

Lanham (op. cit.) interprets all upgliding-high tones as LH tone clusters. "The checking of toneme displacement (i.e. tonal displacement JMK) results in the clustering of the low toneme of the Copulative or Adverbial Prefix with the high toneme of the first syllable of the noun and

this cluster is represented by a rising glide on a short peak-vocoid (unless, of course, terminal juncture brings extra length to the peak of the syllable) ...

a. ... / yizifuba /[´ _ ` _]/y-izifuba/ "They are chests"

b. ... / nendaba /[´ _ _]/na-indaba / "with an affair" ..." (Lanham, 1960: 110)

Tonal displacement from the first syllables is blocked in the two examples above by the feature [+ slack] in the second syllables. Contrast the following examples:

a. yi̱sifu:ba ! "It is a chest"
[_ ¯ ` _]

b. ne̱nta:ba ! "with a mountain"
[_ ` _]

In these examples tonal displacement <u>does</u> take place from the first syllable to the second syllable, which we take to be evidence that the first syllable is [+ slack]. When the feature [+ slack] on the second syllable blocks tonal displacement from the first syllable, then the [+ slack] feature in the first syllable causes the high tone thereon to be realized as an upgliding-high tone.

Cope (op. cit.) interprets "all rising tones as allotones of the high toneme conditioned by depressors." (Cope, 1966: 69). The only exceptions which he lists are the contracted noun prefixes of classes 5, 11, 8, 10 and 2b; and the contracted copulative prefixes. These he interprets as LH tone clusters. We find this statement difficult to understand since the contracted

prefixes of classes 5, 11 and 2b have no upgliding-high tones.

Example:

H	L	HL
i	li	thusi

! ## "copper"

> iithusi Consonant Deletion
> iithuusi Penultimate Mora Creation Rule
> HLHHL Tone Epenthesis Rule
> i:thu:si

The prefixes of classes 8 and 10 are [+ slack]

Example:

H	L	HL
i	ziN	gadi

! ## "gardens"

> izi̧ŋgą̧di Slack Assimilation Rule
> ii̧ŋgą̧di Consonant Deletion
> ii̧ŋgą̧ą̧di Penultimate Mora Creation Rule
> i̧i̧ŋgą̧ą̧di Slack Assimilation Rule
> HLHHL Tone Epenthesis Rule
> í̧:ŋga:di

The contracted copulative prefixes are [+ slack]

Example:

H	L
i̧N	dlu

"It's a house"

> i̧i̧ndlu Penultimate Mora Creation Rule
> HHL Tone Epenthesis Rule
> í̧:ndlu

A final argument against Lanham's and Cope's treatment of upgliding-high as a LH sequence, is that a LH cluster is not found in Zulu as we have

discussed in 1.3.C.

2.2.3 The Low Tone Raising Rules

There are three low tone raising rules, two of them based on anticipatory assimilation and one on perseverative assimilation.

Low Tone Raising Rule 1

$$l \longrightarrow {}^{r}l \;/\; \#\#.\left(\begin{matrix} h \\ l_o \\ V \\ [-\text{ slack}] \end{matrix}\right)\underline{\quad\quad}\;[-\text{ slack}]\;\overset{h}{[-\text{ slack}]}\;..\#\#$$

Within a phrase a low tone on a [- slack] syllable partially assimilates to a high tone on a [- slack] syllable to its immediate right on condition that to its immediate left, the low tone has either a high tone, or one or more low tones on [- slack] syllables.

Examples:

[H u][L ya][H *hamb+a][a] ## "He is going"

> HLHL Mapping Convention
> uyahaamba Penultimate Mora Creation Rule
> HLHHL Tone Epenthesis Rule
> uyaha:mba

[H i][L si][LL guli] ## "a patient"

> LHLL vide Low Prefix Tone Shift Rule, 4.6
> isiguuli Penultimate Mora Creation Rule
> LHLLL Tone Epenthesis Rule
> isigu:li

Here are two examples which illustrate that the feature [+ slack] blocks Low Tone Raising. In the first example it is specified for the first syllable while

in the second example it is specified for the second syllable.

[H][L][LL]
[i][si][guli] ## "It's the patient"

> LHLL vide Low Prefix Tone Shift Rule, 4,6
> isiguuli Penultimate Mora Creation Rule
> LHLLL Tone Epenthesis Rule
> isigu:li
[_ _]

[H][L][LL]
[i][zi][guli] ! ## "patients"

> LHLL vide Low Prefix Tone Shift Rule, 4.6
> iziguuli Penultimate Mora Creation Rule
> LHLLL Tone Epenthesis Rule
> izigu:li
[_ / _]

Low Tone Raising Rule 2

$$l \longrightarrow {}^{r}l \;/\; \#\# \begin{Bmatrix} h \\ l_o \\ V \\ [-\text{ slack}] \end{Bmatrix} \underline{\quad\quad} \overset{r_1}{V}\ [-\text{ slack}]\ \overset{r_1}{V}\ [-\text{ slack}]\ \#\#$$

Within a phrase, a low tone on a [- slack] syllable wholly assimilates to a raised low tone to its immediate right on condition that, to its immediate left, the low tone has either a high tone, or one or more low tones on [- slack] syllables.

This rule is iterative, and it can only apply after Low Tone Raising Rule I has applied, since the latter rule feeds it by providing the raised low tone.

Examples:

[H][L][LLLLL
[a][ma][qebelengwane] ## "mealie meal cakes"

>	LH LLLLL	vide Low Prefix Tone Shift Rule, 4.6
>	LL LLHLL	Vide Ante Penultimate Tone Shift Rule, 4.7
>	amaqebelengwaane	Penultimate Mora Creation Rule
>	LLLLL HLLL	Tone Epenthesis Rule
>	amaqebelengwa:ne	

[H u][L ya][L hlabelel+a][a] ## "He is singing"

>	HLLLLL	Mapping Convention
>	LHLLLL	vide Low Prefix Tone Shift Rule, 4.6
>	LLLHLL	vide Ante-Penultimate Tone Shift Rule, 4.7
>	uyahlabeleela	Penultimate Mora Creation Rule
>	LLLHLLL	Tone Epenthesis Rule
>	uyahlabeie:la	

Low Tone Raising is blocked by the occurrence of the feature [+ slack] in the environment.

Examples:

[H ą][L ma][LLLLL qebelengwane] ## "They're mealie-meal cakes"

>	LHLLLLL	vide Low Prefix Tone Shift Rule, 4.6
>	LLLLHLL	vide Ante-Penultimate Tone Shift Rule, 4.7
>	ąmaqebelengwaane	Penultimate Mora Creation Rule
>	LLLLHLLL	Tone Epenthesis Rule
>	ąmaqebelengwa:ne	

[H zi][L ya][L hlabelel+a][a] ## "They (cl. 10) are singing"

>	HLLLLL	Mapping Convention
>	LHLLLL	vide Low Prefix Tone Shift Rule, 4.6
>	LLLHLL	vide Ante-Penultimate Tone Shift Rule, 4.7
>	ziyahlabeleela	Penultimate Mora Creation Rule
>	LLLHLLL	Tone Epenthesis Rule
>	ziyahlabele:la	
	[_ _ ¯ \ _]	

We have avoided collapsing these two low tone raising rules into a single rule because we assume that the process involved is an assimilatory one and we follow Schuh's (1978: 237) position that such processes occur between adjacent tones. (See the example with bhàmbàbùlà on page 62).

Low Tone Raising Rule 3

$$l \longrightarrow {}^{r}l \;/\; \begin{matrix} h & - & l \\ V & V & V \end{matrix} \; \#\,\# \quad \begin{bmatrix} - \text{ slack} \\ + \text{ long} \end{bmatrix}$$

The low tone on a [+ long] penultimate syllable of a phrase-final word whose final tone is low assimilates to the high tone to its immediate left, and it is realised as a raised low tone.

Examples:

	H LL		
	iN ɲoni	##	"bird"
>	iɲooni		Penultimate Mora Creation Rule
>	HLLL		Tone Epenthesis Rule
>	iɲo:ni		
	[¯ \ _]		

Compare this to the unraised downgliding-low tone, where Low Tone Raising is blocked by the feature [+ slack] in the penultimate syllable:

[H][LL]
[iN][doda] ## "man"
> indo:da
[¯ ˋ _]

These three Low Tone Raising Rules are responsible for the low tone raising in the following surface tones: the raised-level-low tone, the raised-down-gliding-low tone, and the high + raised-low falling tone.

The phonological status of the low tones which have been raised to phonetic high tones by tonal assimilation is in dispute among scholars of Zulu tone. Our position on this matter is very clear: to us these tones are phonological low tones. Rycroft (1963) offers the same interpretation. Cope, on the other hand, interprets such tones as phonological high tones:

"Tonal Assimilation
This process causes a low toneme following a high toneme to become a high toneme, if the low toneme occurs in a nondepressor syllable, e.g. /bábó'nílè+/ (they have seen), but not if it occurs in a depressor syllable, e.g. /bábhà'lílè+/(they have written), or often even in a syllable adjacent to a depressor syllable, e.g. /báhà'mbíle+/(they have gone)." (Cope, 1966: 79)

While we may not agree with all his reasons, we are nonetheless in full agreement with Cope's phonological and phonetic representation of the second and third examples. In the first example, however, we dispute both the phonetic and the phonological representations. Here is our tonological account of this example:

[H][H][ ]
[ba][bon+a][ile] # # "They have seen"
  *

> HHLL Mapping Convention
> HLHL vide Shift to Disyllabic Low, 4.5
> h ^{r}l h l Low Tone Raising Rule
> baboni:le
  [¯ - ¯ _]

In other words, the tonetic details of this example are that the tone on the second syllable is lower than that on the first, while the tone on the third syllable is slightly higher than that on the second syllable. Now, in our analysis, if, within a phrase, the second of two consecutive tones is higher, then it is a high tone, and the first tone is a low tone. We cannot understand how Cope arrived at the tonetic representation: high - equal high - lowered high - low, for the example above.

A second point we would like to raise is that the process that Cope describes as tonal assimilation i.e. where a low tone following a high tone becomes a high tone is generally known as tone spreading: "the tendency for the tone of a syllable to continue into the next syllable ... the extension of a single tone beyond its original domain." (Schuh, 1978: 225, 240).

In Chapter 4, we shall provide strong supporting evidence for the claim that we made in the introduction, viz. that one of the main functions of tone in Zulu is to distinguish the most important morpheme in a construction by according it tonal prominence i.e. the occurrence of a high tone. In order to accomplish this, a series of dissimilation rules apply, whose main objective is the elimination of any competing high tones. In a tone language of this nature, therefore, it is unthinkable that a process like High Tone Spreading could be tolerated. Tonal assimilation in Zulu is partial, never complete and so, assimilated low tones could not be mistaken for

sequences of high tones. The interpretation of raised-low tones as phonological high tones has had a consequence: how does one interpret a high tone which is higher in pitch than the preceding high tone? (In our analysis this problem does not arise since the former tone would be classified a phonological low tone).

The resolution of this problem forced both Lanham and Cope into setting up 'tonal upsteps'. In describing one of the allotones of the high toneme, Lanham writes:

"In a sequence of Hs each H tends to be higher in pitch than the preceding toneme, or, alternatively, final H in a sequence of Hs tends to be higher in pitch than any other.

The crescendo of Hs in sequence (tonal upsteps) is a process most evident when three or more Hs occur in sequence, none of which coincide with a depressor." (Lanham, 1960: 94).

Lanham then gives on page 118, the following example for Zulu:

"Z : / ɲámálálà / [¯ ¯ ¯ _] 'disappear' "

The first point we would like to make is that the verbal stem, /$\overset{L\ L\ L\ L}{ɲamalal+a}$/, as our diagnostic frame indicates below, is a low toned stem.

ɲàkúkhò kùɲàmàlà:là "There is no disappearing"

Another example with a low toned SP also confirms this

ngìyàɲàmàlà:là "I'm disappearing"

The example quoted by Lanham is in the imperative form, and the high tone in evidence is that of the imperative morpheme. As we shall explain and illustrate in 3.8.4, the imperative morpheme is a tonal suffix [HL]. As we indicated in 1.3.1, the imperative tonal suffix is mapped onto the penultimate and the final morae of all disyllabic and longer verbs excepting the CVC+V stems where the suffix is restricted to the final mora.

[L][HL] ## "disappear!"
[namalal+a][ ]

> LLHL Mapping Convention

> namala:la Penultimate Mora Creation
[- - - _]

If at least one of the first three syllables of a low-toned verb of similar length were [+ slack], then the first two low tones would not be raised.

[L][HL] ## "Recline!"
[bhambabul+a][ ]

> LLHL Mapping Convention

> bhambabu:la Penultimate Mora Creation
[- - ¯ _]

These examples demonstrate that phonetic non-low tones in Zulu are not necessarily high tones.

Cope also sets up "tonal upsteps" to explain sequences of high tones in which 'high' tones occur before 'extra high' tones. He writes: "Tonal upsteps are marked by the low-high tonal sequence. Where a low toneme becomes by tonal assimilation a high toneme, the overt upstep as in /ábàfányànà/ (small boys) becomes covert as in /ábáfányànà/. These extra high tones are not to be attributed to an extra high toneme, but to the high toneme in a subsequent intonational

segment. The covert upstep is due to the disappearance of a low toneme and therefore must be marked as phonemic in itself, which is done thus: /ábá"fányànà/." (Cope, 1966: 59).

This example is very difficult to understand since, in our opinion, an 'overt downstep' not an 'overt upstep' occurs in /ábàfányànà/, i.e. /ábà'fányànà/. This is supported by an example provided by Cope himself on page 79, where he illustrates tonal assimilation, i.e. /ábá'fánà/ (boys).

In our analysis, the tone on /ba/ is a raised low tone, and therefore there is no need for any tonal upstep:

[H a]	[L ba]	[HL fana]	[ana]	#,# "small boys"
>	HLHLL			Mapping Convention
>	h ʳ˥ h l l			Low Tone Raising Rule 1
>	a a fana			
	[ ]			

Other examples of 'tonal upstep' provided by Cope are either cases where downstep has been mistaken for upstep or where a raised-low tone has been classified as a high tone:

Cope's Version	Our Version
ùmúntù wá"kú'lówòmùzì	ùmúntù wà'kú'lówòmùzì "A person of that kraal"
léngùbò í"njéngàléyò	léŋgùbò 'í'njéŋgà'léyò (KwaZulu dialect)
léngùbò í"njé"ngá'léyò	lʰéŋgùbò 'í'njé'ŋgá'lʰéyò (Natal Coast dialect) "This blanket is like that one"

To sum up:

a. Tonal assimilation in Zulu affects low tones only.

b. It is anticipatory in all environments excepting on the tone occurring on the long penultimate syllable of a phrase-final word whose final tone is low. In this singular environment, it is perseverative.

c. It is always partial, and never complete.

d. It is blocked by the feature [+ slack].

2.2.4 Downgliding-Low Tone Rule

$$l \longrightarrow {}^{d}l \;/\; \underset{[+\text{ long}]}{\overset{}{\underline{\quad}}}\,V$$

A low tone situated on a long vowel is realized as a downgliding-low tone. This rule causes the downglide in the following surface tones: unraised-downgliding-low tone; raised-downgliding-low tone; high+unraised-downgliding-low falling tone; high+raised-downgliding-low falling tone; upgliding-high+unraised-downgliding-low falling tone.

Examples:

[H i][L li][LLL zambane]	##	"a potato"
> LHLLL		vide Low Prefix Tone Shift Rule, 4.6
> LLHLL		vide Ante-Penultimate Tone Shift Rule, 4.7
> iizambane		Consonant Deletion
> iizambaane		Penultimate Mora Creation Rule
> LLHLLL		Tone Epenthesis Rule
> l:^{u}h l: l		Upgliding-High Tone Rule
> ^{d}l:^{u}h ^{d}l: l		Downgliding-Low Tone Rule
> ^{d}l:^{u}h ^{d}l: ^{l}l		Final Tone Lowering Rule
> i:zamba:ne		
[\ ´ \ _]		

Since downglides characterize low tones only, they facilitate the perceptual categorization of L. Raised-low tones occurring on long vowels can be distinguished from high tones in the same environment through the downglides in the raised-low tones.

Examples:

U.R. [LH aa] # [H u][H hamb+a][H yo] ## "(The one) who is leaving"

S.S. o:hamba:yo
[‾ \ ‾]
h 'h d_l $'l_h$

U.R. [H i][L li][LLLL fasitela] ## "window"

S.S. i:fasite:la
[\ ‾ ‾ \ _]
rd_l r_l h rd_l l_l

U.R. [H i][HL ɲoŋgo] ## "bile, gall-bladder"

S.S. iɲo:ŋgo
[‾ ‾ _]
h 'h l_l

U.R. [H i][LL ɲama] ## "meat, flesh"

S.S. iɲa:ma
[‾ \ _]
h $r\text{-}d_l$ l_l

It is usually very difficult to distinguish the high+downgliding-low falling tone from the raised-downgliding-low tone. The main difference, and this isn't much, is that the fall of the former tone starts higher than that of the latter.

Examples:

U.R. [H H L L] [i ɲoka] ## "snake"

S.S. iɲo:ka

U.R. [H LL] [i ɲama] ## "meat, flesh"

S.S. iɲa:ma

When uncertainty arises as to which surface tone one is dealing with, it is advisable to use the "akukho___" test frame to distinguish them.

Examples:

ąkukho ɲo:ka ## "There is no snake"

ąkukho ɲa:ma ## "There is no meat, flesh"

This test makes it very clear that the first tone is high+low falling tone, while the second one is a downgliding-low tone.

2.2.5 Downstepping Rules

a. l_o h l_o ⟶ [+0 Downstep] / ## ———

b. h l_o ⟶ [∝ + 1 Downstep] / ## .....

[∝ Downstep] ——— ..... ##

Any low tones to the left and to the right of the first high tone are grouped with the high tone into the first tonal step. All these tones are then assigned [+0 Downstep]. The next high tone and any tones to its right are grouped into the second tonal step, and each tone in this tonal step is assigned [+0+1 Downstep]. The third high tone and any low

tones to its right are grouped into the third tonal step, and each tone in this tonal step is assigned [+O+l+l Downstep]. This continues until the end of the phonological phrase is reached, and then we start from the beginning again. The apostrophe sign ['] is employed to mark the tonal step boundary.

Downstep, in this analysis, is a pitch signal indicating a modulation (i.e. a change in key) to a slightly lower key. Each tonal step in a phrase, therefore, is pronounced in a different key from the next one. The first tonal step is produced in the highest key; the next tonal step is in a slightly lower key, and so on until the end of the phrase. This also means that tones within one tonal step are higher than similar tones within the following tonal step i.e. a high tone in tonal step 1 is higher than a high tone in tonal step 2, a raised-low tone in tonal step 1 is higher than a raised-low tone in tonal step 2, and so on.

Examples:

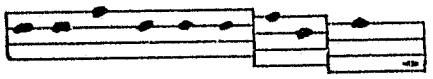
1. U.R. ##[H i][L si][LLL timela] #[H si][L ya][H ba][H shi*y+a][a]##

"They miss their train" lit. "The train is leaving them"

S.S. $r_1\ r_1\ h\ r_1\ r_1\ r_1\ '\ h\ r_1\ '\ l\ l_1$

i si timela si ya ba shi:ya

or isitimela siyabashi:ya

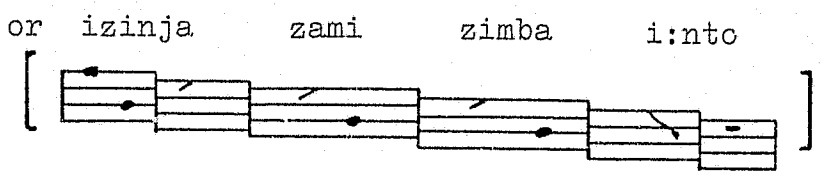


2. U.R. ##[H i][L ziN][H ja] - [L za]([H][L mi]) #[H zi][L mb+a][a] #

[H iN][H tho] ## "My dogs are digging up something"

S.S. $h\ l\ '\ u_h\ '\ u_h\ l\ '\ u_h\ l\ '\ h\ r\text{-}d_1\ '\ l_h$

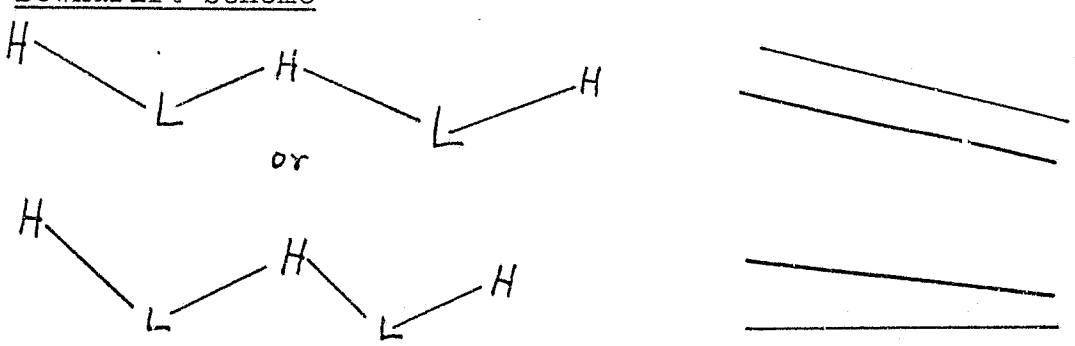
i zi nja zami zimba i nto



The Downstepping Rules apply after all the other Phonetic Realization Rules have applied.

The phenomenon of tonal downstep in Zulu which is embodied in the two rules discussed above, is actually a combination of "downdrift" and "downstep", as they are generally understood.

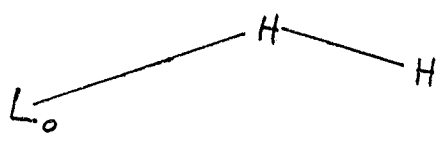
Downdrift Scheme



Schuh describes downdrift as follows "...downdrift is the phenomenon whereby a HI following a LO is lower in pitch than a HI preceding the LO ... in many, if not all, languages having downdrift, the LO tones descend in pitch much more slowly than intervening highs, if they descend at all." (Schuh 1978: 238).

Our claim for Zulu is that all tones in a tonal step, i.e. the high tone and any low tones, are produced at a relatively lower pitch than that of similar tones in the preceding tonal step. This change in key, however, is only clearly perceptible with high tones.

Downstep Scheme



"A phenomenon closely related to downdrift is downstep (DS) ... DS is a lowered HI directly following a HI" (Schuh, 1978: 239). Zulu tonal downstep combines the two tonological processes because of the occurrence of lowered highs following low tones, and lowered highs following other high tones. Example 1 and all the tonal steps excepting tonal step 3, in example 2 above illustrate what would generally be termed "downdrift". The lowered high tone occurring in tonal step 3 of example 2 is what would generally be called downstep.

Lanham was the first to suggest tonal steps for an utterance in Xhosa, a language closely related to Zulu. According to Lanham, pitch descends in tonal steps from the beginning to the end of an utterance or portion thereof. "A high toneme immediately succeeding a low toneme is nearly always lower in pitch than that of any preceding high toneme ..., and a low toneme immediately succeeding a high toneme has an allotone lower in pitch than that of any preceding low toneme, although this tonal downstep is less prominent than that involving the high tonemes ... The boundary of the tonal step, which is the unit within which pitch contrasts are rigidly maintained, always lies between the tonemes in the sequence LH. The sequence HHLLHLLHLHLHL, for example, can be broken up into the following tonal steps:

HHLL -- HLL -- HL -- HL -- HL" (Lanham, 1963: 42)

Our tonal downstep differs from Lanham's in two vital ways:

1. Our tonal step has one high tone and one high tone only with any number of low tones, whereas Lanham's tonal step may have more than one high tone. The reason is to be found in the different methods used for classifying tones into phonemic

and phonetic units. Many of the tones Lanham classifies as H are, in our analysis L. These are the mid tones or raised-low tones which are the result of tonal assimilation.

2. In Lanham's analysis, the boundary of the tonal step lies "between the tonemes in the sequence LH", while in our analysis this boundary always lies to the immediate left of the second and subsequent high tone within the phrase.

To go back to the sequence quoted by Lanham, if the tones he quotes were phonemic tones in our system, then we would break it up into the following tonal steps:

H -- HLL -- HLL -- HL -- HL -- HL

From our knowledge of Lanham's system, the initial H in this sequence would be a L in our system, and therefore the sequence would consist of the following tonal steps. LHLL -- HLL -- HL -- HL -- HL. In our system a high tone can only be followed by a tone lower in pitch, either a 'downstepped' high or a low tone, but in Lanham's system a "high" tone may be followed by a low tone or by another high tone at a slightly higher pitch or by a lowered high tone. In our analysis only a lowered high tone may follow another high tone within the same phonological phrase. Our argument is that in all cases where in Lanham's analysis a high tone is followed by higher-pitched high tone, the first 'high' is actually a raised-low tone, therefore an upstep is not needed between a raised-low tone and a high tone. Once these raised-low tones are accounted for, the remaining high-pitched tones are high tones, and in a succession of such tones downstep is automatic, and therefore Lanham would also not need the phonemic 'step juncture' he sets up:

"Step Juncture. An unpredictable downstep in a succession of high tones occurs in Z, Nd and Sw (Zulu, Ndebele and Swazi) under approximately the same conditions as it does in Xh (Xhosa). Z provides the minimal pair /ɪ́'békà/[¯ ¯ _] "mild mannered person": /ɪ́békà/[¯ ¯ _] or [¯ ¯ _] "he placing" (participial tense), to illustrate the contrast that we assign to the presence or absence of a juncture" (Lanham, 1960: 119). In our analysis, these two forms differ both in their underlying representations and in their surface structures:

$\begin{bmatrix} H \\ i \end{bmatrix}\begin{bmatrix} L \\ li \end{bmatrix}\begin{bmatrix} HL \\ beka \end{bmatrix}$ # "A mild mannered person"

> iibeka Consonant Deletion
> h ^{r}l h l Low Tone Raising Rule 1
> h rdl h l Downgliding-Low Tone Rule
> h rdl ' h l Downstepping Rule
> h rdl ' h l

i:beka

or

i:beka
[\ ¯ _]

$\begin{bmatrix} H \\ i \end{bmatrix}\begin{bmatrix} H \\ {}^{*}bek+a \end{bmatrix}\begin{bmatrix} \\ a \end{bmatrix}$ "he placing"

> HHL Mapping Convention
> LHL vide SP Dissimilation Rule, 4.2
> ^{r}l h l Low Tone Raising Rule 1

ibeka

or

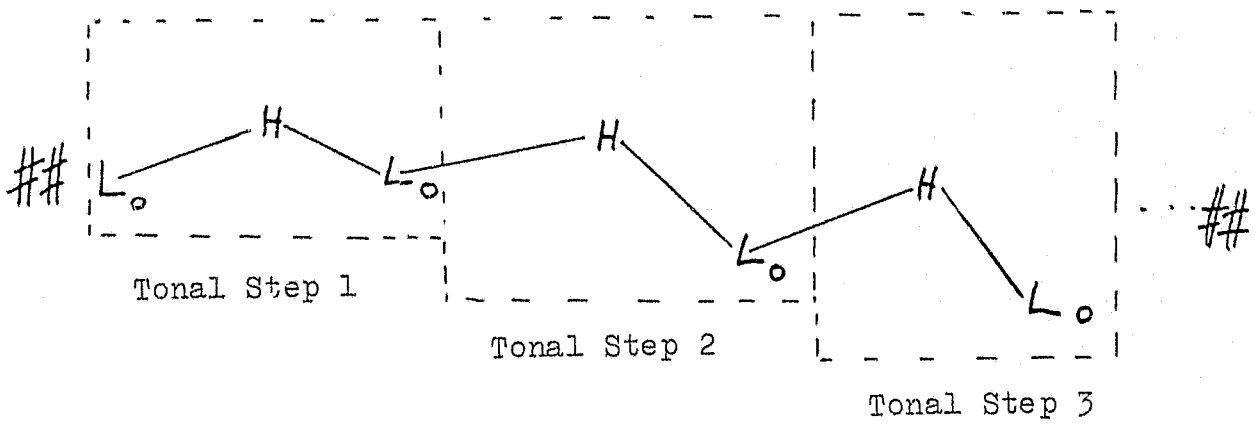
ibeka
[¯ _]

We are convinced that tonal upsteps and the phonemic step juncture were forced on Lanham by the analysis which represented raised-low tones as high tones. To both Rycroft and Cope, downstep marks morphotonemic

boundaries. Rycroft supplies no evidence in support of his view, he only states: "My own view is that downstep within words in Nguni languages - when the intonation allows its realisation - serves to mark morphotonemic boundaries" (Rycroft, 1963: 60). Cope believes that, "The grammatical function of the covert downstep is to mark the boundary of the tonal morpheme of the final couplet (couple of syllables) where it occurs between two high tonemes" (Cope, 1966: 58). We do not agree with either Rycroft or Cope, but we will allow this matter to rest there. A discussion of our differences with Cope would lead us into too lengthy a digression, since the maior part of his thesis probes this whole question of tonal morphemes and the boundaries between them.

Let us conclude this section by presenting this diagram of tonal downstep as presented in our analysis.

Tonal Downstep



CHAPTER 3

3.0 THE MORPHEMES OF ZULU

In this Chapter we wish to supply the tonal matrices of the morphemes that make up the Zulu lexicon. This, however, is not an easy undertaking since a proper study of the underlying segmental matrices with which such tonal matrices co-occur has not been made. A study of the underlying tonal and segmental matrices of Zulu morphemes, which is long overdue, would be a major undertaking and a great contribution to our understanding of Zulu linguistic structure. Unfortunately, in this study, we can only concentrate on the tonal matrices.

Our underlying segmental matrices do not differ too greatly from the segmental surface structures of morphemes presented in Doke (1927). It is for this reason that we shall refer the reader to the relevant section in Doke (1927) of whatever construction we happen to be discussing.

3.1 The Noun (see Doke 1927, Chapters 3 and 4)

The noun is made up of three or four morphemes:

a. the pre-prefix, consisting of a vowel,
b. the basic noun prefix,
c. the basic noun stem (i.e. simple, non-derived), and, in some cases,
d. the noun suffix.

Let us now consider the noun under two headings:

a. the noun prefix (i.e. the pre-prefix and the basic noun prefix) and
b. the noun stem (basic or derived).

3.1.1 The Noun Prefix

Depending on the syntactic context, the underlying phonological shape of the noun prefix may be VCV (i.e. with the pre-prefix) or CV (i.e. without the pre-prefix).

Examples:

ábà'fánà ' báyà'hà ...à "The boys are leaving"

bàfánà hà'mbá:nì "Go, boys!"

Irregular Noun Prefixes

Three classes are exceptions to this VCV/CV alternation, viz. classes 1(a), 2(b) and 9. The following table indicates the shape of these classes when the other classes are either VCV or CV:

	VCV	CV
Class 1(a)	H L u, u	∅
Class 2(b)	L HL HL awoo, oo	H bo
Class 9	H iN	N

In the VCV syntactic position the Class 1(a) morpheme alternant $\begin{bmatrix} L \\ u \end{bmatrix}$ occurs with the noun stem $\begin{bmatrix} L\ H \\ bani \end{bmatrix}$ "who? (singular)", and $\begin{bmatrix} H \\ u \end{bmatrix}$ occurs elsewhere.

Examples:

U.R. $\begin{bmatrix} L \\ u \end{bmatrix}\begin{bmatrix} LH \\ bani \end{bmatrix}$ ## "who? (singular)"

S.S. ùbà:ní

U.R. $\begin{bmatrix} H \\ u \end{bmatrix}\begin{bmatrix} LH \\ baba \end{bmatrix}$ ## "father"

S.S. úbà:'bá

In the CV syntactic position, the class 1(a) noun prefix is Ø.

Example:

U.R. $\begin{bmatrix}H\\wǫ\end{bmatrix}\begin{bmatrix}L\\z+a\end{bmatrix}\begin{bmatrix}HL\\\end{bmatrix}\#\begin{bmatrix}HL\\mąma\end{bmatrix}\ \#\#$ "Come, mother!"

S.S. $w^{\underline{h}}ǫ́zà\ m^{\underline{h}}ą́:mà$

In the VCV syntactic position, class 2(b) has $\begin{bmatrix}L\ HL\\awoo\end{bmatrix}$ as a variant of the more commonly used $\begin{bmatrix}HL\\oo\end{bmatrix}$.

Examples:

U.R. $\begin{bmatrix}LHL\\awoo\end{bmatrix}\begin{bmatrix}LH\\baba\end{bmatrix}\ \#\#$ "our fathers"

S.S. àwᴖ:bà:'bá

or

U.R. $\begin{bmatrix}HL\\oo\end{bmatrix}\begin{bmatrix}LH\\baba\end{bmatrix}\ \#\#$ "our fathers"

S.S. ô:bà:'bá

The morpheme alternant $[b\overset{H}{o}]$ occurs in the CV syntactic position:

Example:

U.R. $\begin{bmatrix}H\\bǫ\end{bmatrix}\begin{bmatrix}LH\\baba\end{bmatrix}\ \#\#$ "Fathers!"

S.S. bóbà:'bá

Basic Tones of Pre-Prefix and Basic Noun Prefix

The diagnostic frame for determining basic tones obviously cannot be used to determine the tone of the pre-prefix, and we therefore require another criterion. since the pre-prefix either surfaces with a high tone or is associated with a shifted high tone (see Tone Shift Rules in Chapter 4) we assume its basic tone is High. The diagnostic frame determines that the basic noun prefix is low.

Examples:

U.R. [H i][L si][H tha] ## "enemy"

S.S. ísì:'thá
(k)ą][xu][kho] #[si][tha

U.R. [L (k)ą][H xu][L kho] #[L si][H tha] ## "There is no enemy"

S.S. ąkúkhò sì:'thá

Consonant Deletion in Noun Prefixes

Consonant Deletion is obligatory with the noun prefixes of classes 5 and 11 when they occur with disyllabic or longer noun stems. With monosyllabic stems Consonant Deletion is optional.

Examples:

H L HL
i li bhasi ## "bus" (class 5)

> iibhasi Consonant Deletion
> î:'bhá:sì

H L H
[u H][lu L][thi H] ## "stick, twig" (Class 11) or

u lu thi ## "stick, twig"

> uuthi Consonant Deletion
> û:'thí

In class 10, Consonant Deletion to the noun prefix is optional if the noun stem is disyllabic or longer, it is not permitted if the stem is monosyllabic.

Example:

[H i][L ziN][HL gane] ## "children, babies"

> izɨŋgąne Slack Assimilation Rule
> iɨŋgąne Consonant Deletion
> ɨ:'ŋgá:nè

To sum up, all VCV noun prefixes have a HL tonal matrix, while CV noun prefixes are associated with L. Exceptional noun prefixes are:
$\begin{bmatrix} H \\ u \end{bmatrix}$ $\begin{bmatrix} L \\ u \end{bmatrix}$ (class 1(a), $\begin{bmatrix} L\ HL \\ awoo \end{bmatrix}$ $\begin{bmatrix} HL \\ oo \end{bmatrix}$ $\begin{bmatrix} H \\ bo \end{bmatrix}$ (class 2(b)
$\begin{bmatrix} H \\ iN \end{bmatrix}$ (class 9).

3.1.2 The Noun Stem

Segmentally there are three types of basic noun stems in Zulu, viz. monosyllabic, disyllabic and trisyllabic stems.

Monosyllabic Stems

There is a two way underlying tonal contrast with monosyllabic stems, viz. High and Low.

Examples:

U.R. $\begin{bmatrix} L \\ ą \end{bmatrix} \# \begin{bmatrix} H \\ ku \end{bmatrix} \begin{bmatrix} L \\ kho \end{bmatrix} \# \begin{bmatrix} L \\ li \end{bmatrix} \begin{bmatrix} L \\ zwe \end{bmatrix} \# \#$ "There is no country"

S.S. ąkúkhò lì:zwè

U.R. $\begin{bmatrix} L \\ ą \end{bmatrix} \# \begin{bmatrix} H \\ ku \end{bmatrix} \begin{bmatrix} L \\ kho \end{bmatrix} \# \begin{bmatrix} L \\ li \end{bmatrix} \begin{bmatrix} H \\ zwi \end{bmatrix} \# \#$ "There is no voice/word"

S.S. ąkúkhò lì:'zwí

Disyllabic Stems

With disyllabic stems there is a four way underlying tonal contrast, viz. LL, LH, HL and $\hat{HL}$ L.

Examples:

U.R. $\begin{bmatrix} L \\ ą \end{bmatrix} \# \begin{bmatrix} H \\ ku \end{bmatrix} \begin{bmatrix} L \\ kho \end{bmatrix} \# \begin{bmatrix} L \\ ma \end{bmatrix} \begin{bmatrix} LL \\ doda \end{bmatrix} \# \#$ "There are no men"

S.S. ąkúkhò màdò:dà

U.R. [L ą] # [H ku][L kho] #[L si][LH dakwa] ## "There is no drunkard"

S.S. ąkúkhò sìdà:'kwá

U.R. [L ą]#[H ku][L kho] #[L ba][HL fana] ## "There are no boys"

S.S. ąkúkhò bà'fá:nà

U.R. [L ą] #[H ku][L kho] #[L ma][H̋L L khaya] ## "There are no homes"

S.S. ąkúkhò mà'khâ:yà

Notice that because Zulu bars the HH sequence morpheme internally, we do not have any HH or H̋L H noun stems. We do, however, have about a dozen disyllabic noun stems which surface as H̋L H, phrase finally.

Examples:

ísì'vû:'vú	"excessive heat"
úm̀'vê:'mvé	"wagtail"
ámà'gû:gú	"large black cockroaches"
í'ngxâ:'ngxá	"green-striped frog"
ísì'gcwâ:'gcwá	"unpopularity"
î:'vô:ndwé	"cane rat"

All these noun stems, excepting /vondwe/ seem to be reduplicative, and, in a sense, their tonal behaviour suggests that they are compounds of some kind. The Lexical Tone Cluster Simplification Rule (see 4.10) does not apply to these noun stems, which supports the claim that the tone cluster that surfaces in phrase final position is not a lexical tone cluster. All these arguments suggest that we handle these noun stems as reduplicative compounds in the following manner:

[H i][L si][H vu][H vu] ## "excessive heat"

> isivuuvu — Penultimate Mora Creation
> HLHLH — Tone Epenthesis
> ísì'vû:vú

Even though the stem /vondwe/ is not overtly reduplicative, if we assume that it, also, is a type of compound, because its tonal behaviour does not differ from that of the other stems which look reduplicative, then it is unnecessary to treat it as exceptional.

[H i][L li][H vo][H ndwe] ## "cane rat"

> iivondwe — Consonant Deletion
> iivoondwe — Penultimate Mora Creation
> HLHLH — Tone Epenthesis
> î:'vô:'ndwé

Trisyllabic Stems

There is a five way underlying tonal contrast with trisyllabic noun stems, viz. LLL, LLH, HLH, LHL and LHLL.

Examples:

U.R. [L ą] # [H ku][L kho] # [L ma][LLL zambane] ## "There are no potatoes"
S.S. ąkúkhò màzàmbà:nè

U.R. [L ą] # [H ku][L kho] # [L ziN][LLH gulule] ## "There are no cheetahs"
S.S. ąkúkhò zìŋgùlù:'lé

U.R. [L ą] # [H ku][L kho] # [L ma][HLH phoyisa] ## "There are no policemen"

S.S. ąkúkhò mà'phóyì:'sá

U.R. [L ą] # [H ku][L kho] #[L ziN][LHL hliziyo] ## "There are no hearts"

S.S. ąkúkhò zìnhlì'zí:yò

U.R. [L a] #[H ku][L kho] #[L mi][LH̃LL phoŋgolo] ## "There are no barrels"

S.S. ąkúkhò mìphò'ŋgô:lò

As a result of the constraint on the H̃LH and HH sequences morpheme internally, the following tonal classes do not occur: HHL, LHH, HHH, HH̃LL, LH̃LH and HH̃LH. There are a few noun stems that surface HHL, but the etymology of all but one of them declares them derived stems:

û:'vé'mvá:nè "butterfly" < [H u][L lu][H mve][H mve][HL ane] ##

û:dlá'mbé:dlù "fierce, wild man" <

H L H H HL
u lu̯ dl+a* # iN bhedlu ##

î:'bhú'ŋgá:nè "beetle" < [H i][L li][HL bhuŋga][HL ane] ##

û:'dé'ŋgé:zì "fragment of earthenware vessel" <
[H u][L lu][HL deŋge][HL ezi] ##

The etymology of the noun /úzávólò/ "night-jar or goat-sucker" is lost in history. However, it behaves tonally like other underlying derived stems.

One other tonal class that does not occur is HLL. We think that Zulu does not tolerate that class because tonally it would be too close to the

disyllabic $\widehat{HLL}$ class. The etymology of one noun stem that surfaces HLL shows that it is a derived stem:

úm'khwényà:nà "bridegroom" < [H u][L m][HL khwenya][ana] ##

Noun Suffixes

The noun stems discussed above may combine with lexically toneless noun suffixes to form derived noun stems. Three suffixes occur with such stems:

a. [kazi] (feminine and augmentative),
b. [ana] (diminutive), and
c. [$\widehat{HLL}$ azi] (feminine suffix alternant, no longer productive)

Examples:

ąkúkhò ndlòvùkà:zì "There is no cow elephant"
< [N][LL dlovu][kazi] ##

ąkúkhò m̀ntwà:nà "There is no child"
< [L mu][L ntu][ana] ##

ąkúkhò ŋkò'mâ:zì "There is no cow"
< [N][LH khomo][$\widehat{HLL}$ azi] ##

The other nominal suffixes [i], [o] and [a], will be seen later to occur with nominal stems derived from verbs.

3.2 The Absolute Pronoun (see Doke, 1927, paragraphs 235-239)

The absolute pronoun has three morpheme alternants:

a. $\left(\begin{bmatrix}H\\ \end{bmatrix}_{\text{root}}^{(L)}\right) + \begin{bmatrix}H\\ na\end{bmatrix}$

b. (H) used with the associative morpheme /nạ̀-/
root

c. $\left(\begin{bmatrix}\hat{H}\\ \end{bmatrix}_{\text{root}}^{(L)}\right)$

There is a need with all non-nominal substantival roots occurring without a pre-prefix, to postulate a 'pre-prefixal' floating high tone, i.e. a high tone associated with a mora preceding that of the substantival root. We associate this high tone with a mora preceding the root because in the absence of a prefix it (the high tone) deletes, it does not become associated with the mora of the root.

Examples:

U.R. $\left(\begin{bmatrix}H\\ \end{bmatrix}\begin{bmatrix}L\\ mi\end{bmatrix}\right) + \begin{bmatrix}H\\ na\end{bmatrix}$ ## "I, me"

S.S. mì:ná

U.R. $\left(\begin{bmatrix}H\\ \end{bmatrix}\begin{bmatrix}H\\ \underline{\underline{la}}\end{bmatrix}\begin{bmatrix}L\\ ba\end{bmatrix}\right)$ ## "these"

S.S. lábà

The evidence for a 'floating' high tone is provided in constructions where the substantival roots occur with non-verbal prefixes. As we shall see in 3.9.0, non-verbal prefixes are underlyingly low-toned, but when occurring with substantival roots in non-negative constructions, they surface with a high tone. This high tone we represent in the underlying structure as the 'floating' high tone of the root.

Examples:

U.R. $\begin{bmatrix}L\\ ki\end{bmatrix}$ # $\left(\begin{bmatrix}H\\ \end{bmatrix}\begin{bmatrix}L\\ mi\end{bmatrix}\right)$ ## "To me"

S.S. kí:mì

U.R. [L ku] # ([H][H la][L ba]) ## "To these"

S.S. kúlábà

Morpheme alternant c. occurs in all possessives excluding first and second persons singular where the HL root of a. is used.

Examples:

U.R. [H i][L si][L ŋkwa] - [L si][L a] # ([ĤL][L khe]) # #
"His bread" (class 1)

S.S. ìsíŋkwà ' sâ:khè

U.R. [H i][L si][L ŋkwa] - [L si][L a] # ([H][L mi]) # #,
"My bread" (1st person, singular)

S.S. ìsíŋkwà ' sá:mì

Morpheme alternant b. occurs whenever preceded by the prefix /nɑ̨-/, excepting in the first and second persons, singular and plural which use the HL root of a.

Examples:

U.R. [H u][L nɑ̨] #[H ye] # # "He is with him" (class 1)

S.S. ún$^{\text{fi}}$ɑ̨:'yé

cf. U.R. [H u][L nɑ̨] # ([H][L thi]) # # "He is with us"
(1st person, plural)

S.S. ú'n$^{\text{fi}}$ɑ́:thì

Morpheme alternant a. occurs elsewhere.

Examples:

[H u][L z+a] #[L ki] # ([H][L mi])[H na] # # "He is coming to me"

> HLHLH Mapping Convention
> úzà'kímì:'ná

The so-called stabilizer $[^{H}_{na}]$ is optional.

3.3 Demonstratives

There are two types of demonstrative constructions viz. the demonstrative pronoun and the locative copulative demonstrative.

3.3.1 The Demonstrative Pronoun (see Doke, 1927, paragraphs 240-245)

The root of the demonstrative pronoun is derived from $([^{H}][^{H}_{la}])$ plus the basic noun prefix of the class. The nasal syllable of the noun prefix deletes (see below). The form $[^{H}_{la}]$ occurs in the KwaZulu dialect, while $[^{H}_{lạ}]$ occurs in the Natal Coast dialect. The forms $[^{H}_{la} \sim {}^{H}_{lạ}]$ occur in the so-called second position, $[^{H}_{\underline{\underline{la}}} \sim {}^{H}_{\underline{\underline{la}}}]$ (i.e. + stress) in the first position, and $[^{LL}_{laa} \sim {}^{LL}_{lạạ}]$ in the so-called third position.
The demonstrative pronoun, like the absolute pronoun, has an initial 'floating' high tone. The second position suffixal morpheme is [o], while that for the third person is $\begin{bmatrix} HLL \\ yanaa \end{bmatrix}$.

Examples, in the different positions:

1st (a) Non-nasal basic prefix

U.R. $[^{L}_{nạ}] \# ([^{H}][^{H}_{\underline{\underline{la}}}][^{L}_{si}]) \#\#$ "with this one"

(class 7) (Natal Coast dialect)

S.S. $n^{ɦ}ɣ́'l^{ɦ}ɣ́sì$

(b) Nasal basic prefix

U.R. $[^{L}_{ku}] \# ([^{H}][^{H}_{\underline{\underline{la}}}][^{L}_{mu}]) \#\#$ "to this one"

(class 1) (KwaZulu dialect)

S.S. kú'lɔ́

2nd U.R. ([H][H lą][L ba]) [o] ## "those" (class 2)
(Natal Coast dialect)

S.S. $l^{ɦ}$ą́:bò

3rd U.R. [L yi] # ([H][LL laa][L zi][HLL yanaa] ## "It's those, over there" (class 10)(KwaZulu dialect)

S.S. $y^{ɦ}$ìlê:zì'yánà:

Class 9 is exceptional in that its basic prefix is [N] and it requires a morpheme alternant [$l\overset{H}{e}$], which clearly derives from a historical assimilation of [$l\overset{H}{a}$] to an earlier basic prefix [ni].

U.R. ([H][H la][N]) ## "This one" (KwaZulu dialect)

S.S. lé

3.3.2 The Locative Copulative Demonstrative (see Doke 1927, paragraphs 570-572)

The root of the locative copulative demonstrative derives from [HL naa ~ H nǫ], plus a morpheme alternant of the basic noun prefix. In classes 1, 4 and 9, the alternant used is [H nǫ] which occurs with a low toned base:

Examples:

U.R. ([H][H nǫ][L ŋgu]) ## "Here is" (class 1)
(1st position)

S.S. $n^{ɦ}$á:ŋgù

U.R. [L nǫ] # ([H][H nǫ] [L nsi]) ## "and this one" or "and these" (class 4 or 9) (1st position)

S.S. n^{h}ǵ'n^{h}ǵ:nsì

The alternant [HL naa] occurs with a morpheme alternant of the basic prefix which is high toned in the 1st and 2nd position, but low toned word in the 3rd position. The suffixes for the so-called second and third positions are the same as those of the demonstrative pronoun. The locative copulative demonstrative, as can be seen in the examples above, also has an initial floating tone.

Examples:

U.R. [L ŋgi][L y+a] # [L ku] # ([H][HL naa][H mpa)][o] # #

"I going to those" (class 2) (2nd position)

S.S. ŋgìyà kú'nâ:'mpó

U.R. ([H][HL naa][L nti)][HLL yanaa] ## "There it is, over there" (class 5) (3rd position)

S.S. nâ:ntì'yánà:

3.4 The Adjective (see Doke 1927, Chapter 6)

In this study, the surface category of "adjective" is derived from a relative clause whose predicate is an adjectival root. The justification is that adjective prefixes have the same tones as relative clauses with verbal predicates. Adjectival roots differ from a semantically similar class of non-verbal relative roots, in that the former incorporate the basic noun prefix (underlined in the examples below) whereas the latter do not.

Adjective	Relative
ìmífùlà ' é'mí'khû:lu "big rivers"	ìmífùlà ' ébà:nzì "broad rivers"
ìmífùlà ' éŋgèmì'khû'lú "rivers which are not big"	ìmífùlà ' éŋgèbà:'nzí "rivers which are not broad"

The following morphemes make up the adjective:

a. $\begin{bmatrix}\text{LH}\\ \text{aa}\end{bmatrix}$, the relative clause morpheme,

b. the basic noun prefix,

c. the adjectival root, and in some cases

d. the augmentative, diminutive and feminine suffix.

The following list of adjectival roots is exhaustive:

[H bi]	"evil, "	[L de]	"long, tall"
[H hle]	"beautiful, good"	[L ne]	"four"
[H sha]	"new, young"	[L ŋe]	"some, other"
[LH ŋgaki]	"how many?"	[LH bili]	"two"
[HL ncane]	"small, little"	[HL hlanu]	"five"
[HL fisha]	"short"	[HL dala]	"old"
[HLL khulu]	"big, great"	[HLL thathu]	"three"
		[HLL niŋgi]	"many, much"

When we discuss the relative, we shall try to defend the fact that the relative morpheme initially functions as an independent word. The basic noun prefix has a high toned morpheme alternant which occurs in non-negative adjectival constructions.

Examples:

U.R. [H mi][LH ŋgaki] ## "How many are they?"

S.S. m^{fi}íŋgà:'kí

U.R. [H a][L ba][L ntu] # [LH aa][H ba][LH bili] ## "Two people"

S.S. àbántù ' á:'bábì:'lí

In the negative the basic prefix (as well as the Subject Prefix in Copulative Constructions, as we shall see later) is low toned.

Examples:

U.R. [L (k)ą] # [L ba][L ba][LH bili][H] ## "They are not two in number"

S.S. ąbàbàbì:lí

The HLL relative and adjectival roots have a HL morpheme alternant which occurs when such a root is verb of the main clause.

Examples:

[H a][L ba][HL fana] # [H ba][HL niŋgi] ## "There are many boys" (literally "The boys are many")

> ábà'fánà ' bá'ní:ŋgì

[H u][L z+a] # [L ka][HL niŋgi] ## "He comes often"

> úzà kà'ní:ŋgì

These HL alternants also occur phrase medially.

3.5 The Relative (see Doke 1927, Chapter 7)

As we have already noted, the source of the relative clause is an embedded sentence. The predicate of such a sentence may be a verb or a copulative. The copulative may be identificative, associative or descriptive. Adjectives and non-verbal relatives are two examples of descriptive copulative predicates; the remaining descriptive copulative predicates are:

a. comparative adverbs
b. quantitatives
c. locatives

Here are examples of all the different types of relative clauses in Zulu:

1. Verbal Roots:

   a. úm̀'fánà ' úyà'hámbà "The boy is leaving"
   b. úm̀'fánà ù'yásè'bénzà "The boy is working"
   c. úm̀'fánà ' ósè'bénzàyò ' úyà'hámbà "The boy who works is leaving"

2. Non-Verbal Roots:

   a. úm̀'fánà ' úyà'hámbà "The boy is leaving"
   b. úm̀'fánà ' úqòthò "The boy is honest"
   c. úm̀'fánà ' óqòthò ' úyà'hámbà "The honest boy is leaving"

3. Adjectival Roots:

   a. úm̀'fánà ' úyà'hámbà "The boy is leaving"
   b. úm̀'fánà m̀^{h}'ncánè "The boy is small"
   c. úm̀'fánà ' óm̀'ncánè ' úyà'hámbà "The small boy is leaving"

4. Identificative Copulative:

   a. úm̀'fánà ' úyà'hámbà "The boy is leaving"
   b. úm̀'fánà ' ú'y^{h}ɨ:'wê:lè "The boy is a twin"
   c. úm̀'fánà ' ó'y^{h}ɨ:'wê:lè ' úyà'hámbà "The boy, who is a twin, is leaving"

5. Associative Copulative:

   a. úm̀'fánà ' úyà'hámbà "The boy is leaving"
   b. úm̀'fánà ' ú'nɛ́'mǫ́tò "The boy has a car"
   c. úm̀'fánà ' ó'nɛ́'mǫ́tò ' úyà'hámbà "The boy, who has a car, is leaving"

6. Comparative Adverb:

   a. úm̀'fánà ' úyà'hámbà "The boy is leaving"
   b. úm̀'fánà ' ú'ŋgá'ŋgámì "The boy is as big as I am"
   c. úm̀'fánà ' ó'ŋgá'ŋgámì ' úyà'hámbà "The boy, who is as big as I am, is leaving"

7. Locative:

   a. úm̀'fánà ' úyà'hámbà "The boy is leaving"
   b. úm̀'fánà ' ú'séndlìnì "The boy is in the house"
   c. úm̀'fánà ' ó'séndlìnì ' úyà'hámbà "The boy, who is in the house, is leaving"

8. Quantitative:

   a. úm̀'fánà ' úyà'hámbà "The boy is leaving"
   b. úm̀'fánà ' ú'yédwà "The boy is on his own"
   c. úm̀'fánà ' ó'yédwà ' úyà'hámbà "One boy is leaving"

The morphemes that make up the relative are the following:

a. $[^{LH}_{aa}]$, the relative clause morpheme,
b. all the morphemes that constitute the predicate of the embedded sentence,
c. $[^{H}_{yo}]$, the relative suffix, which occurs in some environments of the relative clause with a verbal predicate.

When the embedded sentence has a verbal predicate, its SP deletes after the application of tone and segmental rules.

Examples:

$[^{H}_{u}][^{L}_{m}][^{HL}_{fana}] \# [^{LH}_{aa}] \# [^{H}_{u}][^{L}_{gez+a}[_{a}] \# [^{H}_{yo}] \#\#$

"The boy who is washing"

> HLHLLHHLLH — Mapping Convention

> HLHLLHLHLH — vide Shift to Disyllabic Low Morpheme, 4.5

> HLHHLHLHLH — Low Tone Conversion

> umfana # # oo # ugeza # yo — Vowel Assimilation

> umfana oogezayo — SP Deletion and Word Boundary Removal

> úm̀'fánà ' ó:'gézà:'yó

cf.

$$\begin{bmatrix} H \\ a \end{bmatrix}\begin{bmatrix} L \\ ba \end{bmatrix}\begin{bmatrix} HL \\ fana \end{bmatrix} \# \begin{bmatrix} LH \\ aa \end{bmatrix} \# \begin{bmatrix} H \\ ba \end{bmatrix}\begin{bmatrix} L \\ gez+a \end{bmatrix}\begin{bmatrix} \\ a \end{bmatrix} \# \begin{bmatrix} H \\ yo \end{bmatrix} \# \#$$

"The boys who are washing"

>	HLHLLHHLLH	Mapping Convention
>	HLHLLHLHLH	vide Shift to Disyllabic Low Morpheme, 4.5
>	HLHLHHLHLH	Low Tone Conversion
>	abafana aabagezayo	Word Boundary Removal
>	ábà'fánà ' á:bà'gézà:'yó	

Because of their tonal behaviour the relative morphemes $\begin{bmatrix} LH \\ aa \end{bmatrix}$, and the relative suffix $\begin{bmatrix} H \\ yo \end{bmatrix}$ are entered into the embedded sentence as separate words. Consider the following examples:

a. $\begin{bmatrix} H \\ u \end{bmatrix}\begin{bmatrix} L \\ m \end{bmatrix}\begin{bmatrix} HL \\ fana \end{bmatrix} \# \begin{bmatrix} H \\ u \end{bmatrix}\begin{bmatrix} L \\ phil+a \end{bmatrix}\begin{bmatrix} \\ ile \end{bmatrix} \# \#$ "The boy is healthy"

b. $\begin{bmatrix} H \\ u \end{bmatrix}\begin{bmatrix} L \\ m \end{bmatrix}\begin{bmatrix} HL \\ fana \end{bmatrix} \# \begin{bmatrix} H \\ u \end{bmatrix}\begin{bmatrix} L \\ gijim+a \end{bmatrix}\begin{bmatrix} \\ a \end{bmatrix} \# \begin{bmatrix} HL \\ njalo \end{bmatrix} \# \#$
"The boy always runs"

Now, let us embed sentence b. in sentence a.:

$$\begin{bmatrix} H \\ u \end{bmatrix}\begin{bmatrix} L \\ m \end{bmatrix}\begin{bmatrix} HL \\ fana \end{bmatrix} \# \begin{bmatrix} H \\ u \end{bmatrix}\begin{bmatrix} L \\ m \end{bmatrix}\begin{bmatrix} HL \\ fana \end{bmatrix} \# \begin{bmatrix} H \\ u \end{bmatrix}\begin{bmatrix} L \\ gijim+a \end{bmatrix}\begin{bmatrix} \\ a \end{bmatrix} \# \begin{bmatrix} HL \\ njalo \end{bmatrix} \#$$

$$\begin{bmatrix} H \\ u \end{bmatrix}\begin{bmatrix} L \\ phil+a \end{bmatrix}\begin{bmatrix} \\ ile \end{bmatrix} \# \#$$

Let us now transform the embedded sentence into a relative clause:

$$\begin{bmatrix} LH \\ aa \end{bmatrix} \# \begin{bmatrix} H \\ u \end{bmatrix}\begin{bmatrix} L \\ m \end{bmatrix}\begin{bmatrix} HL \\ fana \end{bmatrix} \# \begin{bmatrix} H \\ u \end{bmatrix}\begin{bmatrix} L \\ gijim+a \end{bmatrix}\begin{bmatrix} \\ a \end{bmatrix} \# \begin{bmatrix} HL \\ njalo \end{bmatrix} \# \begin{bmatrix} \\ \end{bmatrix}$$

"The boy who always runs"

Now let us delete the noun which is subject of the

relative clause:

[LH aa] # [H u] [L gijim+a] [a] # [HL njalo] # "who always runs"

We must allow our phonological tone rules to apply now i.e. before the removal of the word boundary after /aa/.

Example:

[LH aa] # [H u] [L gijim+a] [a] # [HL njalo] ## "Who always runs"

>	oo # ugijima # njalo ##	Vowel Assimilation and Vowel Deletion
>	LHHLLLHL	Mapping Convention
>	LHLLHLHL	vide Phrase Medial Tone Shift 4.9
>	oougijima # njalo	Word Boundary Removal
>	oogijima # njalo	SP Deletion
>	oogijima # njaalo	Penultimate Mora Creation
>	LHLHLHHL	Tone Epenthesis
>	HHLHLHHL	Low Tone Conversion
>	ó:gì'jímà ' njá:lò	Long Vowel Realization
	or	
>	ógì'jímà 'njá:lò	(Optional) Vowel Shortening

If we remove the word boundary first, and then apply the phonological tone rules, we get wrong results:

[LH aa] # [H u] [L gijim+a] [a] # [HL njalo] ## "Who always runs"

>	aaugijima njalo	Word Boundary Removal
>	ougijima njalo	Vowel Assimilation and Vowel Deletion
>	oogijima njalo	SP Deletion
>	LHLLLHL	Mapping Convention
>	HHLLLHL	Low Tone Conversion
>*	ó:gìjìmà njá:lò	Penultimate Mora Creation etc.

When the word boundary after /aa/ deletes, then $\begin{bmatrix} LH \\ aa \end{bmatrix}$ and $\begin{bmatrix} H \\ u \end{bmatrix}$ fall within the same bi-moric syllable peak. Since a high tone may not be shifted from a bi-moric syllable peak (see 1.2.1), there is no high tone for the Phrase Medial Tone Shift Rule, and this leads to wrong results. To get the correct results we must allow the Phrase Medial Tone Shift Rule to apply before boundary deletion.

Let us now substitute the relative suffix /yo/ for the adverb /njalo/.

$$\begin{bmatrix} LH \\ aa \end{bmatrix} \# \begin{bmatrix} H \\ u \end{bmatrix} \begin{bmatrix} L \\ m \end{bmatrix} \begin{bmatrix} HL \\ fana \end{bmatrix} \# \begin{bmatrix} H \\ u \end{bmatrix} \begin{bmatrix} L \\ gijim+a \end{bmatrix} \begin{bmatrix} \\ a \end{bmatrix} \# \begin{bmatrix} H \\ yo \end{bmatrix} \# \#$$

"The boy who is running"

The noun which is subject of the relative clause then deletes:

$$\begin{bmatrix} LH \\ aa \end{bmatrix} \# \begin{bmatrix} H \\ u \end{bmatrix} \begin{bmatrix} L \\ gijim+a \end{bmatrix} \begin{bmatrix} \\ a \end{bmatrix} \# \begin{bmatrix} H \\ yo \end{bmatrix} \# \#$$ "who is running"

Again, we want the phonological tone rules to apply before the removal of the word boundaries:

>	LHLLHLH	vide Phrase Medial Tone Shift, 4.9
>	oo+ugijima+yo	Vowel Assimilation and Vowel Deletion
>	oogijimayo	SP Deletion
>	LHLHLH	Mapping Convention
>	oogijimaayo	Penultimate Mora Creation
>	LHLHLLH	Tone Epenthesis
>	HHLHLLH	Low Tone Conversion
>	HHLLHLH	vide Tonal Displacement, 4.11
>	ó:gìjìmâ:'yó	Long Vowel Realization
	or	
>	ógìjìmâ:yó	(Optional) Vowel Shortening Rule

Tone Shift never applies to the high tone on the relative morpheme (cf. Tone Shift and Tonal

Displacement rules in Chapter 4). In order to express this phenomenon, the relative morpheme is considered inherently bi-moric (see Vowel Length, 1.2.1). In most environments, however, it surfaces as a short vowel after the application of Vowel Shortening, a low-level rule that applies after all other tonal rules. However, there are environments where it obligatorily surfaces as a long vowel. These are where a short vowel would obliterate a distincttion between the relative morpheme and another morpheme:

àmántòmbàzànè ' ázògèzà ## "The girls will wash"
àmántòmbàzànè ' á:zògèzà ## "The girls who will wash"

3.6 <u>The Enumerative</u> (see Doke 1927, Chapter 8)

Two morphemes make up the enumerative:

a. The basic noun prefix, and
b. the enumerative root.

There are four enumerative roots:

[H ni] "what type/kind of?"

[H phi] "which?"

[L ne] "one"

[L mbe] "different, strange"

Examples:

[H ku][L z+a] # [L mu][H phi] ## "which one (person) is coming?"
> kúzà mù':phí

[H ku][L y+a] # [HL ʃashi] # [L li][L ɲe] "One horse is going"
> kúyà'ʃáshì lìɲè

3.7 The Quantitative (see Doke 1927, paragraphs 247-259)

The quantitative is made up of:

a. the quantitative prefix, inherently low toned,
b. the quantitative root, with an initial floating tone, and in some cases
c. the diminutive suffix.

The quantitative roots are:

([H][L ŋke]) "all"

([H][L dwa]) "alone, only"

Examples:

[L ŋgi][L hlal+a] # [L ŋge]([H][L dwa]) ## "I live on my own"
> ŋgìhlàlà ŋgé:dwà

[H ba][L zo][L z+a] # [L bo]([H][L ŋke])[L ana] ## "They'll come to the last one of them"
> bázɔ̀zà'bóŋkà:nà

There are four adjectival stems which occur in the quantitative construction. These constructions translate "both", "all three", "all four" and "all five" and they are made up of the basic noun prefix plus the adjectival root.

$\begin{bmatrix} H \\ a \end{bmatrix}\begin{bmatrix} L \\ ba \end{bmatrix}\begin{bmatrix} HL \\ fana \end{bmatrix} \# \begin{bmatrix} L \\ bo \end{bmatrix}\begin{bmatrix} H \\ ba \end{bmatrix}\begin{bmatrix} LH \\ bili \end{bmatrix} \#\#$ "Both boys"

> ábà'fánà bò'bábì':lí

For the quantitative prefix we posit a low tone and for the root a "pre-prefixal" floating tone because the quantitative derives from a copulative, and, tonally, it behaves like a copulative, which has a low toned non-verbal formative and a root with a "pre-prefixal" floating tone (see 3.9.0). Whenever this "pre-prefixal" morpheme occurs, then the quantitative prefix-surfaces with a low tone e.g.

bòbá'hlá:nù "all five of them" $< \begin{bmatrix} L \\ bo \end{bmatrix}\begin{bmatrix} H \\ ba \end{bmatrix}\begin{bmatrix} HL \\ hlanu \end{bmatrix} \#\#$

zòzímbì:'lí "both of them" $< \begin{bmatrix} L \\ zo \end{bmatrix}\begin{bmatrix} H \\ ziN \end{bmatrix}\begin{bmatrix} LH \\ bili \end{bmatrix} \#\#$

If, however, the "pre-prefixal" morpheme deletes, only its segmental matrix deletes, its tone remains as a floating tone.

Example:

zómbì:'lí "both of them" $< \begin{bmatrix} L \\ zo \end{bmatrix}\left(\begin{bmatrix} H \\ \end{bmatrix}\begin{bmatrix} \\ N \end{bmatrix}\begin{bmatrix} LH \\ bili \end{bmatrix}\right) \#\#$

This analysis then suggests the floating tone for the other two roots where synchronic evidence for a deleted "pre-prefixal" morpheme is lacking.

Examples:

zó:ŋkè "all of them" $< \begin{bmatrix} L \\ zo \end{bmatrix}\left(\begin{bmatrix} H \\ \end{bmatrix}\begin{bmatrix} \\ N \end{bmatrix}\begin{bmatrix} L \\ ŋke \end{bmatrix}\right) \#\#$

bó:dwà "they, only" $< \begin{bmatrix} L \\ bo \end{bmatrix}\left(\begin{bmatrix} H \\ \end{bmatrix}\begin{bmatrix} L \\ dwa \end{bmatrix}\right) \#\#$

3.8 The Verb (see Doke 1927, Chapters 10-12)

The verb consists of:

a. Either the subject prefix or the imperative morpheme. If the subject prefix occurs, then the object prefix and the long form morpheme /ya/ may also occur,
b. a verbal radical, and
c. a tense suffix.

3.8.1 The Verbal Radical

The verbal radical may be the verbal root only, or it may be the root plus one or more verbal extensions. The verbal root is sometimes referred to as the base or unextended radical, while the form occurring with extensions is termed the extended radical. These verbal extensions, which extend the meaning of the base radical, are all, as we shall see later, toneless.

As we indicated in the introduction, the verbal system differs from the noun system in that, in the former, there is no free choice of tone per syllable. A high verb is associated with one, and only one high tone This high tone may be a single tone or it may be part of the high-low tone cluster. With disyllabic and trisyllabic verbal roots, the high tone or high-low tone cluster is associated with the penultimate mora of the root, which is the designated mora; and to indicate this we star it. With high monosyllabic verbs, the designated mora is the only mora of the stem, and this is also starred. This association of the high tone with the designated mora (which happens to be the penultimate mora in disyllabic and trisyllabic roots) explains why there is no Low-High verbal class. The lexical low tone of low verbal stems is associated with the left-most mora of the disyllabic or trisyllabic root. All other toneless morae in the verbal stem are associated with low

tones by the Toneless Low Convention.

The underlying tone classes of Zulu verbal roots illustrated in the following table:

	High Tone Class	Low Tone Class	High-Low Tone Class
C+V	H	L	-
VC+V	HL	LL	$\widehat{HL}L$
CVC+V	HL	LL	$\widehat{HL}L$
VCVC+V	LHL	LLL	-
CVCVC+V	LHL	LLL	-

The two classes of high disyllabic roots are manifested only in the participial and infinitive forms of the KwaZulu dialect, and only in the participial in the Natal Coast dialect. The contrast between /úmà è'bô:nà/ "if he sees" ($\widehat{HL}L$ verb) and /úmà è'há:mbà/ "if he goes" (HL verb) illustrates the need for the HL class as distinct from the $\widehat{HL}L$ class.

The HL class appears to be a marginal one. Not only are there few HL verbs, but it is noticeable that for many speakers these verbs will sometimes be treated as $\widehat{HL}L$ verbs. This suggests the class of HL verbs may disappear in time from the language.

Let us now illustrate the different tone classes of verbs:

There is a two-way underlying contrast with monosyllabic verbal roots:

$\begin{bmatrix} L \\ ą \end{bmatrix} \# \begin{bmatrix} H \\ ku \end{bmatrix} \begin{bmatrix} L \\ kho \end{bmatrix} \# \begin{bmatrix} L \\ ku \end{bmatrix} \begin{bmatrix} L \\ lw+a \end{bmatrix} \# \#$ "There is no fighting"

> ąkúkhò kù:lwà

tones by the Toneless Low Convention.

The underlying tone classes of Zulu verbal roots illustrated in the following table:

	High Tone Class	Low Tone Class	High-Low Tone Class
C+V	H	L	-
VC+V	HL	LL	$\hat{HLL}$
CVC+V	HL	LL	$\hat{HLL}$
VCVC+V	LHL	LLL	-
CVCVC+V	LHL	LLL	-

The two classes of high disyllabic roots are manifested only in the participial and infinitive forms of the KwaZulu dialect, and only in the participial in the Natal Coast dialect. The contrast between /úmà è'bô:nà/ "if he sees" ($\hat{HLL}$ verb) and /úmà è'há:mbà/ "if he goes" (HL verb) illustrates the need for the HL class as distinct from the $\hat{HLL}$ class.

The HL class appears to be a marginal one. Not only are there few HL verbs, but it is noticeable that for many speakers these verbs will sometimes be treated as $\hat{HLL}$ verbs. This suggests the class of HL verbs may disappear in time from the language.

Let us now illustrate the different tone classes of verbs:

There is a two-way underlying contrast with monosyllabic verbal roots:

$\begin{bmatrix} L \\ ą \end{bmatrix}$ # $\begin{bmatrix} H \\ ku \end{bmatrix}\begin{bmatrix} L \\ kho \end{bmatrix}$ # $\begin{bmatrix} L \\ ku \end{bmatrix}\begin{bmatrix} L \\ lw+a \end{bmatrix}$ # # "There is no fighting"

> ąkúkhò kù:lwà

$\begin{bmatrix}L\\ ą\end{bmatrix}$ # $\begin{bmatrix}H\\ ku\end{bmatrix}\begin{bmatrix}L\\ kho\end{bmatrix}$ # $\begin{bmatrix}L\\ ku\end{bmatrix}\begin{bmatrix}H\\ *\\ sh+a\end{bmatrix}$ ## "There is no burning"

> ąkúkhò kù':shá

With VC+V verbal roots, there is also a two way contrast:

$\begin{bmatrix}L\\ ą\end{bmatrix}$ # $\begin{bmatrix}H\\ ku\end{bmatrix}\begin{bmatrix}L\\ kho\end{bmatrix}$ # $\begin{bmatrix}L\\ ku\end{bmatrix}\begin{bmatrix}L\\ ehl+a\end{bmatrix}$ ## "There is no getting off"

> ąkúkhò kwè:hlà

$\begin{bmatrix}L\\ ą\end{bmatrix}$ # $\begin{bmatrix}H\\ ku\end{bmatrix}\begin{bmatrix}L\\ kho\end{bmatrix}$ # $\begin{bmatrix}L\\ ku\end{bmatrix}\begin{bmatrix}\widehat{HL}\\ *\\ eb+a\end{bmatrix}$ ## "There is no stealing"

> LHLHLL Mapping Convention

> ąkúkhò ' kwê:ba (KwaZulu dialect)

The above pronunciation is that of the KwaZulu dialect. In the Natal Coast dialect, Lexical Tone Cluster Simplification (see 4.8), a rule that applies phrase medially elsewhere, applies both phrase medially and phrase finally to infinitives incorporating VC+V forms in the $\widehat{HL}$L class:

$\begin{bmatrix}L\\ ą\end{bmatrix}$ # $\begin{bmatrix}H\\ ku\end{bmatrix}\begin{bmatrix}L\\ kho\end{bmatrix}$ # $\begin{bmatrix}L\\ ku\end{bmatrix}\begin{bmatrix}\widehat{HL}\\ *\\ eb+a\end{bmatrix}$ ## "There is no stealing"

> LHLH$\widehat{\text{LL}}$ Mapping Convention

> LHLLH vide Lexical Tone Cluster Simplification, 4.10

> àkúkhò kwè:'bá

The form $\begin{bmatrix}\widehat{HL}\\ *\\ VC+V\end{bmatrix}$ must be regarded as an alternant occurring in the Indicative Participial and Infinitive; elsewhere the alternant $\begin{bmatrix}H\\ *\\ VC+V\end{bmatrix}$ occurs, as the following example illustrates.

Examples:

$\begin{bmatrix}H\\u\end{bmatrix}\begin{bmatrix}L\\ya\end{bmatrix}\begin{bmatrix}H\\{}^{*}eb+a\end{bmatrix}\begin{bmatrix}\\a\end{bmatrix}\#\#$ "He is stealing"

> ú'yé:bà Vowel Deletion and Mapping Convention

Here are some examples of the three-way contrast found with CVC+V verbal roots, viz. L, H, $\widehat{HL}$.

$\begin{bmatrix}L\\ą\end{bmatrix}\#\begin{bmatrix}H\\ku\end{bmatrix}\begin{bmatrix}L\\kho\end{bmatrix}\#\begin{bmatrix}L\\ku\end{bmatrix}\begin{bmatrix}L\\phuph+a\end{bmatrix}\#\#$ "There is no dreaming"

> ąkúkhò kùphù:phà

$\begin{bmatrix}L\\ą\end{bmatrix}\#\begin{bmatrix}H\\ku\end{bmatrix}\begin{bmatrix}L\\kho\end{bmatrix}\#\begin{bmatrix}L\\ku\end{bmatrix}\begin{bmatrix}H\\{}^{*}phûz+a\end{bmatrix}\#\#$ "There is no drinking"

> ąkúkhò kù'phú:zà

$\begin{bmatrix}L\\ą\end{bmatrix}\#\begin{bmatrix}H\\ku\end{bmatrix}\begin{bmatrix}L\\kho\end{bmatrix}\#\begin{bmatrix}L\\ku\end{bmatrix}\begin{bmatrix}\widehat{HL}\\{}^{*}bhâl+a\end{bmatrix}\#\#$ "There is no writing" (KwaZulu dialect)

> ąkúkhò kù'bhâ:là

In the KwaZulu dialect the $\begin{bmatrix}\widehat{HL}\\{}^{*}CVC+V\end{bmatrix}$ stem is found in the participial and infinitive; in other constructions a $\begin{bmatrix}H\\{}^{*}CVC+V\end{bmatrix}$ alternant is used. In the Natal Coast dialect, the $\begin{bmatrix}\widehat{HL}\\{}^{*}CVC+V\end{bmatrix}$ stem is found only in the participial, in the infinitive and elsewhere a $\begin{bmatrix}H\\{}^{*}CVC+V\end{bmatrix}$ alternant is used.

Examples:

$\begin{bmatrix}L\\ą\end{bmatrix}\#\begin{bmatrix}H\\ku\end{bmatrix}\begin{bmatrix}L\\kho\end{bmatrix}\#\begin{bmatrix}L\\ku\end{bmatrix}\begin{bmatrix}H\\{}^{*}bhâl+a\end{bmatrix}\#\#$ "There is no writing" (Natal Coast dialect)

> ąkúkhò kù'bhá:là

[H u][L ya][H bhál+a][a] ## "He is writing"
> úyà'bhá:lâ

The trisyllabic roots are illustrated next.

Examples:

[L ą] # [H ku][L kho] # [L ku][L ethuk+a] ## "There is no fright"
> ąkúkhò kwèthù:kà

[L ą] # [H ku][L kho] # [L ku][H ethúk+a] ## "There is no insult"
> ąkúkhò kwè'thú:kà

[L ą] # [H ku][L kho] # [L ku][L ngqongqoz+a] ## "There is no knocking (at the door)"
> ąkúkhò kùngqòngqò:zà

[L ą] # [H ku][L kho] # [L ku][H dumál+a] ## "There is no disappearance"
> ąkúkhò kùdù'má:là

As we indicated a little earlier, all verbal extensions are toneless. On suffixation, they are assigned low tones by convention: The extensions are:

[an+a] - Reciprocal extension
[is+a] - Causative extension
[el+a] - Applied extension
[isis+a] - Intensive extension
[ek+a] ~ [akal+a] - Neuter extension
[w+a] - Passive extension

Examples:

[L ų][L ya][L hlek+a][is+a][a] ## "You are amusing" (lit. you cause (people) to laugh).

> ùyàhlèkì:sà

[H ba][L zo] #[H zond+a][an+a] ## "They'll hate each other/one another"

> HLHLL — Mapping Convention

> HLLHL — vide Shift to Disyllabic Low, 4.5

> bázò'ndá:nà

The passive extension [w+a] has an alternant [iw+a], found with (V)C+V verbal roots which arises through i-epenthesis. In the Indicative, principal, present, negative, the passive extension occurs with the negative suffixal alternant $\overset{\frown}{\underset{a}{HLL}}$.

Examples:

[H li][L ya][L hlabelel+a][w+a][a] ## "It is sung"

> liyahlatshelelwa — Palatalization and Vowel Deletion

> HLLLLL — Mapping Convention

> LLLHLL — vide Ante-Penultimate Tone Shift, 4.7

> lìyàhlàtshélè:lwà

[L ą] #[H li][L hlabelel+a][w+a][$\overset{\frown}{\text{HLL}}$ a] ## "It is not sung"

> alihlatshelelwa — Palatalization and Word Boundary Removal

> LHLLH$\overset{\frown}{\text{LL}}$ — Mapping Convention

> ą̀líhlàtshè'lê:lwà

3.8.2 Verbal Prefixes

In this study only four morphemes are treated as underlying verbal prefixes, viz. the subject prefix,

the object prefix, the phrase-final-position-marker /ya/, and the 'hortative' prefix /(m)ą/. All other surface verbal prefixes are treated as underlying deficient verbs as will be discussed below.

The Subject Prefix

Concordially derived and non-cordial subject prefixes have three morpheme alternants, namely $[+\ \underset{SP}{\text{slack}}]$, $[\underset{SP}{\hat{HL}}]$ and $[\underset{SP}{H}]$.

The morpheme alternant $[+\ \underset{SP}{\text{slack}}]$ occurs in the Indicative, principal, positive, with first and second persons, singular and plural.

Examples:

$\begin{bmatrix} L \\ nį \end{bmatrix}\begin{bmatrix} L \\ zo \end{bmatrix} \# \begin{bmatrix} H \\ jabúl{+}a \end{bmatrix} \#\#$ "You'll be happy"

> LLLHL Mapping Convention

> nį̀zòjàbú:là

cf. $\begin{bmatrix} HL \\ uma \end{bmatrix} \# \begin{bmatrix} H \\ ni \end{bmatrix}\begin{bmatrix} L \\ zo \end{bmatrix} \# \begin{bmatrix} H \\ jabúl{+}a \end{bmatrix} \#\#$ "If you'll be happy"

> HLHLLHL Mapping Convention

> úmà ' nízòjà'bú:là

The alternant $[\underset{SP}{\hat{HL}}]$ occurs with monosyllabic high verbs in the Indicative, participial, positive.

Example:

$\begin{bmatrix} HL \\ uma \end{bmatrix} \# \begin{bmatrix} \hat{HL} \\ e \end{bmatrix}\begin{bmatrix} H \\ m{+}a \end{bmatrix}\begin{bmatrix} \ \\ a \end{bmatrix} \#$ "If he should stop"

> HLĤLH Mapping Convention

> HLĤLL vide Monosyllabic Verb Tone Dissimilation, 4.3

> úmà ' ê:mà

The alternant $[H]_{SP}$ occurs elsewhere.

Example:

$[H\ ba][L\ zo] \# [H\ jabúl^{*}+a] \#\#$ "They'll be happy"

> HLLHL Mapping Convention

> bázòjà'bú:là

The Object Prefix

The object prefix has two morpheme alternants, viz. $[\hat{HL}]_{OP}$ and $[H]_{OP}$. The first alternant occurs with high monosyllabic verb stems in the Indicative, participial and in the Infinitive.

Example:

$[HL\ uma] \#[H\ e][\hat{HL}\ yi][H\ dl+a^{*}][a] \#\#$ "If he eats it"

> HLHHL̂L vide Monosyllabic Verb Tone Dissimilation, 4.3

> úmà ' é'yî:dlà

The alternant $[H]_{OP}$ occurs elsewhere:

Example:

$[H\ u][L\ ŋga] \#[H\ yi][L\ dabul+a][\hat{HL}\ i] \#\#$ "Don't tear it"

> úŋgà'yídà'bû:lì

The Prefix /ya/.

This prefix is underlyingly low toned.

Examples:

$[L\ sɨ][L\ ya][H\ sébenz^{*}+a][a] \#\#$ "We are working"

> sɨyàsèbé:nzà

[H ba][L ya][H vúk+a][a] ## "They are getting up"
> báyà'vú:kà

The only case where [^{L}ya] surfaces with a high tone, is when it has acquired this tone from the SP to its left and has a low tone to its right.

Example:

[H u][L ya][L hlèk+a][a] ## "He is laughing"
> HLLL Mapping Convention
> LHLL vide Low Prefix Tone Shift, 4.6
> ùyáhlè:kà

The Prefix [(m)^{L}ą]

Underlyingly, the 'hortative' prefix [(m)^{L}ą] is the initial syllable of the conjunction [$^{L\ HL}$mąkee], which governs a present subjunctive complement, as in the following example:

[LHL (m)ąkee] #[H si][L hlabelel+a][H e] ## "Let us sing"
> LHLHLLLH Mapping Convention
> LHLLLHLH vide Ante-Penultimate Tone Shift, 4.7
> ąkê: sìhlà'bélè:'lé

But sometimes the [^{HL}kee] deletes, resulting in [^{L}mą], as in the following example:

[LHL (m)ąkee] #[H si][L hlabelel+a][H e] ##
> (m)ąsìhlàbélè:'lé

In addition to the conventional deficient verbs of Zulu, such as [^{L}be] 'past present", and [^{H}se] 'exclusive' etc, we shall discuss certain morphemes under this heading that are not normally regarded as

deficient verbs. If forms such as [(k)ą̀] 'negative', [ŋgà] 'negative', [sá] 'progressive', [ŋgá ~ ŋgée] 'conditional', [á] 'past subjunctive' positive, [áa] 'remote past', [ŋgâa] 'negative past subjunctive', [ká] 'negative exclusive', and [bóo] 'exhortative subjunctive' are categorized as verbs, it greatly facilitates and clarifies the description of SP Dissimilation (see 4.1) and Ante-Penultimate Tone Shift (see 4.7). Moreover it is necessary to regard the future formative [zú ~ yú] as a deficient verb since it is the locus of the negative high tone, which is otherwise found at the ends of verbs and copulatives. We are aware that the decision to treat these formatives as deficient verbs leaves certain questions unanswered, in particular the obvious fact that in certain respects they do not behave like conventional deficient verbs because they have become fully cliticized. However, it is beyond the scope of this study to explore the extremely interesting question of compounding and cliticization in Zulu, and we will simply use the evidence to be presented below as justification for the above assumption:

The two negative prefixes [(k)ą̀] and [ŋgà], we consider to be underlying deficient verbs, and we speculate that they could have arisen in the same way as the present day negative marker [mʊ̨sà], which can be shown to derive from an earlier deficient verb. In the speech of very old speakers of the KwaZulu dialect, [mʊ̀sà] still occurs as a deficient verb:

Example:

U.R. [(k)ą̀] # [ka] [mʊ̨sa] [a] # [u] [ku] [ŋgi] [hluph+a] # #

"He shouldn't bother me"

S.S. ą̀kàmʱʊ́sà ù'kúŋgi'hlú:phà

In modern Zulu, however, [$\overset{H\ L}{\text{mʊ̨sa}}$] does not occur with prefixes nor with negative [$\overset{L}{\text{(k)ą̣}}$].

Example:

m$^{\text{ɦ}}$ʊ̨sà ù'kúŋgì'hlú:pha "Don't bother me"

For the formatives [$\overset{L}{\text{(k)ą̣}}$] and [$\overset{L}{\text{ŋgā}}$] we posit low tones since they always surface with low tones.

$\begin{bmatrix}L\\(k)a\end{bmatrix}\#\begin{bmatrix}H\\ba\end{bmatrix}\begin{bmatrix}L\\hlabelel+a\end{bmatrix}\begin{bmatrix}HL\\i\end{bmatrix}\#\#$ "They don't sing"

> ạ̀báhlàbè'lélì

$\begin{bmatrix}H\\a\end{bmatrix}\begin{bmatrix}L\\ŋga\end{bmatrix}\#\begin{bmatrix}L\\hlabelel+a\end{bmatrix}\begin{bmatrix}\widehat{HL}L\\i\end{bmatrix}\#\#$ "He shouldn't sing"

> áŋgàhlàbè'lê:lì

All bi-moric deficient verbs are considered HL, while all other non-negative deficient verbs, excepting [$\overset{L}{\text{zō}}$ ~ $\overset{L}{\text{yō}}$] are high toned:

$\begin{bmatrix}H\\sa\end{bmatrix}$ "progressive"

$\begin{bmatrix}H\\be\end{bmatrix}$ "continuous"

$\begin{bmatrix}H\\se\end{bmatrix}$ "exclusive"

$\begin{bmatrix}H\ \ \ HL\\ŋga\sim ŋgee\end{bmatrix}$ "conditional"

$\begin{bmatrix}HL\\aa\end{bmatrix}$ "remote past"

$\begin{bmatrix}HL\\boo\end{bmatrix}$ "exhortative"

$\begin{bmatrix}HL\\ŋgaa\end{bmatrix}$ "past subjunctive"

$\begin{bmatrix}L\ \ \ L\\zo\sim yo\end{bmatrix}$ "future positive"

([L zu][H]) ~ ([L yu][H]) "future negative"

[H ka] "negative exclusive"

Notice that by postulating underlying high tones for these formatives, the lowering of the subject prefix before any of them then becomes the general process of dissimilation of the SP high tone to the verbal root high tone

Examples:

[H u][H sa] # [L gez+a][a] ## "He is still washing"

> HHLL — Mapping Convention
> LHLL — vide SP Dissimilation, 4.2
> ùságè:zà

[H u][H be] # [H e][L gez+a][a] ## "He was washing"

> HHHLL — Mapping Convention
> LHHLL — vide SP Dissimilation, 4.2
> LHLHL — vide Shift to Disyllabic Low, 4.5
> LLLHL — vide Deficient Verb Lowering .
> ùbè:gé:zà

[H u][H se] # [e][gez+a][a] ## "He is already washing"

> HHHLL — Mapping Convention
> LHHLL — vide SP Dissimilation Rule, 4.2
> LHLHL — vide Shift to Disyllabic Low, 4.5
> ùsê:'gé:zà

[H u][H a] # [L gez+a][a] ## "and he washed"

> HHLL Mapping Convention
> LHLL vide SP Dissimilation, 4.2
> wágè:zà

[H u][HL aa] # [L gez+a][HL a] ## "He washed"

> HHLLH Mapping Convention
> LHLLH vide SP Dissimilation, 4.2
> wâ:gè:'zá

[H ni][HL boo] #[L gez+a] ## "Do wash"

> LHLLL vide SP Dissimilation 4.2
> nìbô:gè:zà

[L ą] #[H li][H a] ## [HL ŋgaa] #=[L gez+a][HL a] ##
"... and it didn't wash"

> LHHHLHL Mapping Convention
> LLHHLHL vide SP Dissimilation, 4.2
> ą̀lá'ŋgâ':gé:zà

Contractions usually apply to this construction resulting in the llowing alternate surface forms:

ą̀lâ:'gé:zà
lá'ŋgâ:'gé:zà

The majority of those deficient verbs that occur in the Indicative, participial sub-mood, surface with a low tone in this sub-mood. The tone rule lowering the high tone in this sub-mood has to be ordered to apply after the SP Dissimilation Rule.

Deficient Verb Tone Lowering

H ⟶ L / (_____(L) + [verbal complement])

Indicative, participial

Conditions:

1. Does not apply to 'progressive' [$\overset{H}{\text{sa}}$]
2. Applies to 'continuous' [$\overset{H}{\text{be}}$], in both the principal and participial sub-mood.

The rule states that of all those high toned deficient verbs that become cliticized, those that occur in the Indicative, Participial sub-mood, excepting [$\overset{H}{\text{sa}}$], become low toned. The deficient verb [$\overset{H}{\text{be}}$], however, becomes low toned in both the Principal and the Participial sub-moods of the Indicative.

Examples:

$\begin{bmatrix} HL \\ uma \end{bmatrix} \begin{bmatrix} H \\ e \end{bmatrix}\begin{bmatrix} H \\ se \end{bmatrix} \# \begin{bmatrix} H \\ e \end{bmatrix}\begin{bmatrix} H \\ \overset{*}{h}amb+a \end{bmatrix}\begin{bmatrix} \\ a \end{bmatrix} \#\#$ "If he's already leaving" (Participial)

> HLHHHHL Mapping Convention
> HLLHLHL vide SP Dissimilation, 4.2
> HLLLLHL Deficient Verb Tone Lowering
> úmà èsè:'há:mbà

cf. $\begin{bmatrix} H \\ u \end{bmatrix}\begin{bmatrix} H \\ se \end{bmatrix} \# \begin{bmatrix} H \\ e \end{bmatrix}\begin{bmatrix} H \\ \overset{*}{h}amb+a \end{bmatrix}\begin{bmatrix} \\ a \end{bmatrix} \#\#$ "He is already leaving" (Principal)

> HHHHL Mapping Convention
> LHLHL vide SP Dissimilation, 4.2
> ùsê:'há:mbà

$\begin{bmatrix} HL \\ nǫma \end{bmatrix} \# \begin{bmatrix} H \\ e \end{bmatrix}\begin{bmatrix} HL \\ aa \end{bmatrix} \# \begin{bmatrix} \\ ɲamalal+a \end{bmatrix}\begin{bmatrix} \overset{\frown}{HLL} \\ a \end{bmatrix} \#\#$ "Although he disappeared" (Participial)

> HLHHLLLLH͡LL Mapping Convention
> HLLHLLLLH͡LL vide SP Dissimilation, 4.2
> HLLLLLLLH͡LL Deficient Verb Tone Lowering
> $n^{\underset{\frown}{h}}$ǫ́mà à:ɲàmà'lâ:là Vowel Deletion

cf. [H u][HL aa] # [L ŋamalal+a][$\hat{HLL}$ a] ## "He disappeared" (Principal)

> HHLLLH$\hat{L}$L Mapping Convention
> LHLLLH$\hat{L}$L vide SP Dissimilation, 4.2
> wâ:ŋàmà'lâ:là Consonantalization

The rule applies to [^{H}be] in both the principal and participial sub-moods:

[H u][H be] # [H e][H sebenz+a][a] ## "He was working" (Principal)

> HHHLHL Mapping Convention
> LHLLHL vide SP Dissimilation, 4.2
> LLLLHL Deficient Verb Tone Lowering
> ùbè:sèbé:nzà

[HL nǫma] # [H e][H be] # [H e][H sebenz+a][a] ## "Although he was working" (Participial)

> HLHHHLHL Mapping Convention
> HLLHLLHL vide SP Dissimilation, 4.2
> HLLLLLHL Deficient Verb Tone Lowering
> n^{h}ǫ́mà èbè:sè'bé:nzà

Notice, however, that /s^{H}a/ in the derivation below is exceptional with respect to the tone rule above which lowers high-toned deficient verbs in the participial sub-mood.

[HL uma] # [H e][H sa] # [L cabaŋg+a][$\hat{HLL}$ a] ## "If he still thinks" (Participial)

> HLHHLH$\hat{L}$L Mapping Convention
> HLLHLH$\hat{L}$L vide SP Dissimilation, 4.2
> úmà ' è'sácà'bâ:ŋga

The remaining high toned formatives do not occur in

the Indicative, Participial sub-mood.

Lowering of [ŋga^{H}]

There is an unexpected case of a lowering of the high tone of /nga/ in certain non-participial constructions. We merely note these for the record but can offer no explanation at this stage.

Examples:

$\begin{bmatrix}H\\u\end{bmatrix}\begin{bmatrix}L\\th+i\end{bmatrix}$ # $\begin{bmatrix}H\\a\end{bmatrix}\begin{bmatrix}H\\ŋga\end{bmatrix}$ # $\begin{bmatrix}H*vuk+a\end{bmatrix}\begin{bmatrix}\\a\end{bmatrix}$ # "As soon as he gets up"

> úthì àŋgà'vúkà

cf. $\begin{bmatrix}H\\u\end{bmatrix}\begin{bmatrix}L\\th+i\end{bmatrix}$ # $\begin{bmatrix}H\\a\end{bmatrix}\begin{bmatrix}H\\ŋga\end{bmatrix}$ # $\begin{bmatrix}H*vuk+a\end{bmatrix}\begin{bmatrix}\\a\end{bmatrix}$ # # "He says he can get up"

> úthì à'ŋgá'vú:kà

$\begin{bmatrix}L\\(k)ɕ\end{bmatrix}$ # $\begin{bmatrix}H\\ka\end{bmatrix}\begin{bmatrix}L\\ze\end{bmatrix}$ # $\begin{bmatrix}H\\a\end{bmatrix}\begin{bmatrix}H\\ŋga\end{bmatrix}$ # $\begin{bmatrix}L\\sh+a\end{bmatrix}\begin{bmatrix}\\a\end{bmatrix}$ # # "He doesn't usually say"

> ɕkázè àŋgà:shò

Negative Exclusive [ka^{H}]

The negative 'exclusive' formative /ka/ occurs either immediately after an SP, or after negative [ŋga^{L}], when the intervening word boundary has been removed. In the former case it surfaces as low toned, but in the latter it is high toned. Since the alternation L⟶H does not occur in Zulu tonology, we have to posit an underlying high tone for this formative.

Example:

$\begin{bmatrix}HL\\nɔma\end{bmatrix}$ # $\begin{bmatrix}H\\e\end{bmatrix}\begin{bmatrix}L\\ŋga\end{bmatrix}$ # $\begin{bmatrix}H\\ka\end{bmatrix}$ # $\begin{bmatrix}H*hamb+a\end{bmatrix}\begin{bmatrix}\hat{HLL}\\i\end{bmatrix}$ # # "Although he has not yet left"

> HLHLHH$\hat{\text{HLL}}$ Mapping Convention

> n^{ɦ}ɔ́mà ' éŋgà'ká'hâ:mbì

This formative surfaces with a low tone as a result of the application of Monosyllabic Verb Tone Dissimilation (see 4.1 for an illustration of the application of this rule to [$\overset{H}{ka}$]).

The Future Morphemes

The future morphemes are actually deficient verbs in so far as they take a complement in the same way as traditional deficient verbs.

The positive morphemes are [$\overset{L}{zo}$], [$\overset{L}{yo}$] and [$\overset{LL}{oo}$]. The [$\overset{L}{zo}$] 'immediate future' [$\overset{L}{yo}$] 'remote future' distinction is made in our speech. The formative [$\overset{LL}{oo}$] has a 'remote future' significance.

Examples:

$\begin{bmatrix} H \\ u \end{bmatrix}\begin{bmatrix} L \\ zo \end{bmatrix} \#\begin{bmatrix} H \\ \overset{*}{h}amb+a \end{bmatrix} \# \#$ "He'll leave" (immediate)

> HLHL Mapping Convention

> úzò'há:mbà

$\begin{bmatrix} H \\ ba \end{bmatrix}\begin{bmatrix} L \\ yo \end{bmatrix} \#\begin{bmatrix} H \\ \overset{*}{h}amb+a \end{bmatrix} \# \#$ "They'll leave" (remote)

> HLHL Mapping Convention

> báyò'há:mbà

$\begin{bmatrix} H \\ si \end{bmatrix}\begin{bmatrix} LL \\ oo \end{bmatrix} \#\begin{bmatrix} L \\ bohl+a \end{bmatrix} \#\begin{bmatrix} LH\hat{L}L \\ manyosi \end{bmatrix} \# \#$ "It (the stomach) will shrink, Manyosi!" (remote)

> HLLLLLH$\hat{L}$L Mapping Convention

> sô:bòhlà mà'nyô:sì

The negative future morphemes are ([$\overset{L}{zu}$][^{H}]) ~ ([$\overset{LL}{zuu}$][^{HH}]) 'immediate' and ([$\overset{L}{yu}$][^{H}]) ~ ([$\overset{LL}{yuu}$][^{HH}]) 'remote'. We posit an underlying low tone for these formatives because they do not condition SP Dissimilation. The 'floating' high tones are negative tones. When the

complement is a full infinitive then the vowel /u/ and the tones associated with it delete.

Example:

$\begin{bmatrix} L \\ (k)ą \end{bmatrix}$ # $\begin{bmatrix} H \\ li \end{bmatrix}\left(\begin{bmatrix} L \\ zu \end{bmatrix}\begin{bmatrix} H \\ \end{bmatrix}\right)$ # $\begin{bmatrix} H \\ u \end{bmatrix}\begin{bmatrix} L \\ ku \end{bmatrix}\begin{bmatrix} L \\ bol+a \end{bmatrix}$ ## "It will not go bad" (immediate)

> LHHHLLL — Mapping Convention
> LHHLHLL — vide Low Prefix Tone Shift, 4.6
> ąlízù'kúbò:là — Deletion of Negative Suffix

The morphemes $(\begin{bmatrix} LL \\ zuu \end{bmatrix}\begin{bmatrix} HH \\ \end{bmatrix})$ and $(\begin{bmatrix} LL \\ yuu \end{bmatrix}\begin{bmatrix} HH \\ \end{bmatrix})$ occur with an infinitive suffix which is minus the noun prefix:

Example:

$\begin{bmatrix} L \\ (k)ą \end{bmatrix}$ # $\begin{bmatrix} H \\ ba \end{bmatrix}\left(\begin{bmatrix} LL \\ zuu \end{bmatrix}\begin{bmatrix} HH \\ \end{bmatrix}\right)$ # $\begin{bmatrix} L \\ hlal+a \end{bmatrix}$ ## "They won't stay" (immediate)

> LHHHLL — Mapping Convention
> ąbá'zú:hlà:là

3.8.3 Verbal Tense Suffixes

There are eight tense suffixes that occur with the verb:

1. $[-a \sim \begin{bmatrix} \hat{HLL} \\ -a \end{bmatrix}]$ - the positive Indicative and Conditional present tense suffix.
2. $\begin{bmatrix} HL \\ -i \end{bmatrix}$, $\begin{bmatrix} HL \\ -e \end{bmatrix}$ and $\begin{bmatrix} HL \\ -a \end{bmatrix}$ - present principal, present conditional and past subjunctive negative suffixes.
3. $[\begin{bmatrix} \hat{HLL} \\ -i \end{bmatrix} \sim \begin{bmatrix} \hat{HLL} \\ -a \end{bmatrix}]$ - $\begin{bmatrix} L \\ ŋga \end{bmatrix}$ negative suffix, present principal 'exclusive' and 'passive' negative suffix.
4. $[\begin{bmatrix} L \\ -e \end{bmatrix} \sim \begin{bmatrix} H \\ -e \end{bmatrix} \sim \begin{bmatrix} \hat{HLL} \\ -e \end{bmatrix}]$ - positive present subjunctive tense suffix.
5. $[\begin{bmatrix} \hat{HLL} \\ -a \end{bmatrix}]$ - remote past tense suffix.
6. $[\begin{bmatrix} HL \\ -aŋga \end{bmatrix}]$ - negative past tense suffix.

complement is a full infinitive then the vowel /u/ and the tones associated with it delete.

Example:

$\begin{bmatrix} L \\ (k)ą \end{bmatrix}$ # $\begin{bmatrix} H \\ li \end{bmatrix}\left(\begin{bmatrix} L \\ zu \end{bmatrix}\begin{bmatrix} H \end{bmatrix}\right)$ # $\begin{bmatrix} H \\ u \end{bmatrix}\begin{bmatrix} L \\ ku \end{bmatrix}\begin{bmatrix} L \\ bol+a \end{bmatrix}$ ## "It will not go bad" (immediate)

> LHHHLLL — Mapping Convention

> LHHLHLL — vide Low Prefix Tone Shift, 4.6

> ąlízù'kúbò:là — Deletion of Negative Suffix

The morphemes ($[\overset{LL}{zuu}][\overset{HH}{\ }]$) and ($[\overset{LL}{yuu}][\overset{HH}{\ }]$) occur with an infinitive suffix which is minus the noun prefix:

Example:

$\begin{bmatrix} L \\ (k)ą \end{bmatrix}$ # $\begin{bmatrix} H \\ ba \end{bmatrix}\left(\begin{bmatrix} LL \\ zuu \end{bmatrix}\begin{bmatrix} HH \end{bmatrix}\right)$ # $\begin{bmatrix} L \\ hlal+a \end{bmatrix}$ ## "They won't stay" (immediate)

> LHHHLL — Mapping Convention

> ąbá'zú:hlà:là

3.8.3 Verbal Tense Suffixes

There are eight tense suffixes that occur with the verb:

1. $[-a \sim \overset{\widehat{HLL}}{-a}]$ - the positive Indicative and Conditional present tense suffix.
2. $[\overset{HL}{-i}]$, $[\overset{HL}{-e}]$ and $[\overset{HL}{-a}]$ - present principal, present conditional and past subjunctive negative suffixes.
3. $[\overset{\widehat{HLL}}{-i} \sim \overset{\widehat{HLL}}{-a}]$ - $[ŋ\overset{L}{ga}]$ negative suffix, present principal 'exclusive' and 'passive' negative suffix.
4. $[\overset{L}{-e} \sim \overset{H}{-e} \sim \overset{\widehat{HLL}}{-e}]$ - positive present subjunctive tense suffix.
5. $[\overset{\widehat{HLL}}{-a}]$ - remote past tense suffix.
6. $[\overset{HL}{-a}ŋga]$ - negative past tense suffix.

7. [-$\overset{HL}{\underline{ee}}$] - past/stative phrase medial tense suffix.
8. [-$\overset{\frown}{\underline{ile}}$ ~ -$\overset{\frown}{\underline{e}}$ ...$\underline{e}$ ~ -$\overset{\frown}{\underline{e}}$ ~ -$\overset{\frown}{\underline{i}}$/-ile ~ -e ...e ~ -e ~ -i] - past/stative phrase final suffix.

The morpheme alternant [$\overset{\frown}{a}$] occurs in the Indicative, participial, positive which incorporates the progressive [$\overset{H}{sa}$] formative, and the alternant [a] (i.e. toneless) occurs in the positive of the Indicative present principal, present participial (without [$\overset{H}{sa}$]) and present Conditional.

Examples:

[HL uma] # [H e][H sa] # [L qhubek+a][$\overset{\frown}{a}$] ## "If he's still continuing" (Indicative Present Participial + [$\overset{H}{sa}$])

> HLHHLHLL Mapping Convention
> HLLHLHLL vide SP Dissimilation, 4.1
> úmà è'sáqhù'bê:kà

[HL uma] # [H e][L qhubek+a][a] ## "If he continues" (Indicative Present Participial - [$\overset{H}{sa}$])

> HLHLLL Mapping Convention
> HLLHLL vide Ante-Penultimate Tone Shift, 4.7
> úmà è'qhúbè:kà

[H u][L ya][H bon+a][a] ## "He sees" (Indicative, Present, Principal)

> HLHL Mapping Convention
> úyà'bó:nà

[H a][H ŋga] # [L vel+a][a] ## "He may appear" (Conditional, Present)

> HHLL Mapping Convention
> LHLL vide SP Dissimilation, 4.2
> àŋgávè:là

The negative suffixes [$\overset{HL}{i}$], [$\overset{HL}{e}$] and [$\overset{HL}{a}$] occur in the Indicative, principal, present (minus 'exclusive' [$\overset{H}{ka}$] and 'passive' [w+a]), Conditional, present and subjunctive, past respectively.

Examples:

[$\overset{L}{(k)ạ}$] # [$\overset{H}{ka}$][$\overset{L}{gez+a}$][$\overset{HL}{i}$] ## "He doesn't wash" (Indicative principal, present ~ 'exclusive' and 'passive')

> LHHL Mapping Convention

> ạ̀ká'gé:zì

[$\overset{H}{ba}$][$\overset{HL}{ŋgee}$] #[$\overset{L}{ɲamalal+a}$][$\overset{HL}{e}$] ## "They can't disappear" (Conditional, present)

> HHLLLHL Mapping Convention

> LHLLLHL vide SP Dissimilation, 4.2

> bàŋgê:ɲàmà'lá:lè

[$\overset{L}{(k)ạ}$] #[$\overset{H}{si}$][$\overset{H}{a}$] #[$\overset{HL}{ŋgaa}$] #[$\overset{L}{gijim+a}$][$\overset{HL}{a}$] ## "and they did not run" (Past Subjunctive)

> LHHHLLHL Mapping Convention

> LLHHLLHL vide SP Dissimilation, 4.2

> LHHLLHL Mapping Convention

> ạ̀sá'ŋgâ:gì'jí:mà.

The negative suffix [$\overset{\widehat{HLL}}{i}$ ~ $\overset{\widehat{HLL}}{a}$] occurs with any present tense co-occurring with negative formative [$\overset{L}{ŋgà}$], and also with the Indicative, principal, present incorporating exclusive [$\overset{H}{ka}$] or passive [w+a] in the negative.

Examples:

[$\overset{H}{u}$][$\overset{L}{ku}$][$\overset{L}{ŋga}$] # [$\overset{L}{cabaŋg+a}$][$\overset{\widehat{HLL}}{i}$] ## "Not to think" (Negative incorporating [$\overset{L}{ŋgà}$])

> HLLLHLL Mapping Convention
> LHLLHLL vide Low Prefix Tone Shift, 4.6
> ùkúŋgàcàbâ:ŋgì

$\begin{bmatrix} L \\ (k)ą \end{bmatrix}$ # $\begin{bmatrix} H \\ ba \end{bmatrix}\begin{bmatrix} H \\ ka \end{bmatrix}$ # $\begin{bmatrix} L \\ hlabelel+a \end{bmatrix}\begin{bmatrix} HLL \\ i \end{bmatrix}$ ## "They have not yet sung" (Indicative, principal, present + 'exclusive' [$\overset{H}{ka}$])

> LHHLLHLL Mapping Convention
> LHLLLHLL vide Monosyllabic Verb Tone Dissimilation, 4.1
> ąbákàhlàbè'lê:lì

$\begin{bmatrix} L \\ (k)ą \end{bmatrix}$ # $\begin{bmatrix} H \\ ku \end{bmatrix}\begin{bmatrix} H \\ \overset{*}{la}l+a \end{bmatrix}\begin{bmatrix} \\ w+a \end{bmatrix}\begin{bmatrix} HLL \\ a \end{bmatrix}$ ## "There is no sleeping" (Indicative, principal, present + passive [w+a]).

> LHHLL Mapping Convention
> LLHLL vide SP Dissimilation, 4.2
> ąkùlâ:lwà

The present subjunctive morpheme alternant [$\overset{L}{e}$] occurs with (V)C+V, and also with [$C\overset{L}{V}C+V$] verb stems:

Examples:

$\begin{bmatrix} L \\ ŋgi \end{bmatrix}\begin{bmatrix} H \\ \overset{*}{fu}n+a \end{bmatrix}\begin{bmatrix} \\ a \end{bmatrix}$ # $\begin{bmatrix} H \\ a \end{bmatrix}\begin{bmatrix} H \\ dl+\overset{*}{a} \end{bmatrix}\begin{bmatrix} L \\ e \end{bmatrix}$ ## "I want him to eat"

> LHLHH Mapping Convention
> LHLHL vide Monosyllabic Verb Tone Dissimilation, 4.1
> ŋgìfúnà'á:dlè

$\begin{bmatrix} H \\ u \end{bmatrix}\begin{bmatrix} H \\ \overset{*}{kee} \end{bmatrix}$ # $\begin{bmatrix} H \\ a \end{bmatrix}\begin{bmatrix} L \\ bhem+a \end{bmatrix}\begin{bmatrix} L \\ e \end{bmatrix}$ ## "He sometimes smokes"

> HHLHLL Mapping Convention
> LHLHLL vide SP Dissimilation, 4.2
> LHLLHL vide Shift to Disyllabic Low, 4.5
> ùkê à'bhé:mè

[H a][L ze] # [H a][H *ákh+a][L e] ## "...until he builds"
> HLHL Mapping Convention
> ázè'á:khè

The morpheme alternant [$\overset{\frown}{e}^{HLL}$] co-occurs with the object prefix in the subjunctive. To our knowledge, this is the only case where a suffix's tone is sensitive to the presence of an object prefix.

Example:

[L ŋgi][H *fún+a][a] # [H a][H ba][L os+a][el+a][$\overset{\frown}{e}^{HLL}$] ##
"I want him to roast (it) for them"
> LHLHHHLL Mapping Convention
> ŋgìfúnà ' á'bó'sê:lè

The alternant [$\overset{H}{e}$] occurs elsewhere in the present subjunctive:

Examples:

[H u][L th+i] # [H ba][H hamb+a][H e] ## "He says they should go"
> HLHLH vide Root Tone Dissimilation, 4.4
> úthì ' báhà:'mbé

The construction "OP - Verb - e" has traditionally been termed the imperative, incorporating the object prefix. Tonal and segmental evidence suggests that this is not so: this construction is the present subjunctive minus its subject prefix. The tonal and segmental evidence is supplied by the suffix [$\overset{\frown}{e}^{HLL}$]. In the following examples, the one occurring with the subject prefix is politer in usage, but to us they are both subjunctive forms:

[H u][H ba][L biŋgelel+a][Ĥ̂LL e] ## "Do greet them"
> HHLLHĤ̂LL Mapping Convention
> ú'bábìŋgè'lê:lè

[H ba][L biŋgelel+a][Ĥ̂LL e] ## "Greet them"
> HLLHĤ̂LL Mapping Convention
> bábìŋgè'lê:lè

The suffix [a^{ĤLL}] occurs in the Indicative, remote past, principal and participial.

Examples:

[H u][HL aa] # [L thukuthel+a][Ĥ̂LL a] ## "He became angry" (principal)
> LHLLLĤ̂LL vide SP Dissimilation, 4.2
> HLLLLĤ̂LL Mapping Convention
> wâ:thùkù'thê:là

[HL nǫma] # [H e][HL aa] # [H balek+a][Ĥ̂LL a] ## "even though he ran away" (participial)
> HLLHLHHĤ̂LL vide SP Dissimilation, 4.2
> HLLLLHHĤ̂LL Deficient Verb Tone Lowering
> HLLLLLHĤ̂LL vide Root Tone Dissimilation, 4.4
> HLLLHLL Mapping Convention
> n^{ĥ}ǫ́mà à:bà'lê:kà

The negative past tense suffix [aŋ^{HL}ga] occurs in both the principal and participial sub-moods of the Indicative.

Examples:

[L (k)ę] #[H ba][L lw+a][HL aŋga] ## "They didn't fight" (principal)
> LHHL Mapping Convention
> ę̀bá'lwá:ŋgà

[HL uma] # [H zi][L ŋga] # [L w+a][HL aŋga] ## "If they didn't fall" (participial)

> HLHLHL Mapping Convention

> úmà ' zíŋgà'wá:ŋgà

The tense suffix [HL ee] which is stressed, occurs in all phrase medial positions of the past tense, and as the phrase medial allomorph of [ile].

Examples:

[H u][L lw+a][HL ee] # [L nạ] # [H iN][L gwe] ## "He fought with a leopard"

> HHLHL Mapping Convention

> ú'lwê:'n^{ɦ}é:ŋgwè

[H ba][L lamb+a][HL ee] # [L ka][H bi] ## "They are very hungry"

> bálà'mbê: kà'bí

The past/stative morpheme alternants [ile ~ e...e ~ e ~ i] occur in the Indicative, principal, positive:

Examples:

[H ba][L lamb+a][ile] ## "They are hungry"

> HLLL Mapping Convention

> LHLL vide Ante-Penultimate Tone Shift, 4.7

> bàlámbì:lè

[H ba][H *bon+a][an+a][e...e] ## "They saw each other"

> HHLL Mapping Convention

> HLHL vide Shift to Disyllabic Low, 4.5

> bábò'né:nè Affixation and Vowel Deletion

The morpheme alternants [-ile -e...e -e -i] occur elsewhere. Here are two examples in the Indicative, participial, positive:

[HL uma] # [H e][H phumúl+a][HLL e] ## "If he is resting"
> HLLHHLL vide SP Dissimilation, 4.2
> HLLLHLL vide Root Tone Dissimilation, 4.4
> úmà èphù'mû:lè

[HL nǫma] # [H i][H esúth+a][HLL i] ## "Even though it is full"
> HLLHHLL vide SP Dissimilation, 4.2
> HLLLHLL vide Root Tone Dissimilation, 4.4
> HLLHLL Mapping Convention
> nǵǫ́mà yè'sû:thì

The negative conjugation of all stative tenses, i.e. verbal and copulative, occurs with a suffixal negative 'floating' tone.

Examples:

[L (k)ą] # [H ka][L lamb+a][HLL ile][H] ## "He is not hungry" (Stative, verb)
> LHLHLH Mapping Convention
> ąkálà'mbî:'lé

[L (k)ą] # [L wu][LL banzi][H] ## "He isn't broad" (Stative, copulative)
> LLLH Mapping Convention
> ąwùbà:nzí

3.8.4 The Imperative

The imperative morpheme, [HL], is a suffixal tonal morpheme. It is one of the few examples of segmentless morphemes in Zulu. Another we have seen is negative [H].

Consonant-commencing disyllabic and longer verbal radicals are converted into the imperative by the suffixation of this morpheme only.

Examples:

[L gijim+a][HL] ## "run!"
> LHL Mapping Convention
> gìjí:mà

[H phu̍z+a][HL] ## "drink!"
> LHL vide Root Tone Dissimilation, 4.4
> HL Mapping Convention
> phú:zà

However, vowel-commencing disyllabic and longer verbal radicals are converted into the imperative by prefixing [yi̱] and suffixing the imperative morpheme.

Example:
[L yi̱][L enab+a][HL] ## "Stretch out your legs"
> LHL Mapping Convention
> yi̱ènáːbà

The association of the high tone of the imperative morpheme with the penultimate mora of low disyllabic verbs is blocked, since it would obliterate the distinction between low and high disyllabic verbs. The imperative H therefore associates with the suffix mora and because L is unassociated, it deletes:

Example:

[L hlek+a][HL] ## "laugh!"
> LH Mapping Convention
> hlèːká

There is a handful of $\overset{L}{CVC}$+V radicals with two imperative surface structures, one in which the association of the high tone with the penultimate mora is blocked, the other in which it isn't.

Examples:

[L hlal+a][HL] ## "Sit down!"
> LH Mapping Convention
> hlà:lá

or

> HL Mapping Convention
> hlá:là

[L suk+a][HL] ## "Move away!"
> LH Mapping Convention
> sù:ká

or

> HL Mapping Convention
> sú:kà

The imperative prefix [$\overset{L}{y\text{ɨ}}$] also occurs with all (V)C+V verbal stems. Here, too, the high tone of the imperative morpheme associates with the final mora and the unassociated L deletes.

Examples:

[L yɨ][L mb+a][HL] ## "Dig!"
> LH Mapping Convention
> $y^{\text{ɦ}}$ɨ:mba

[L yɨ][L eq+a][HL] ## "Jump!"
> LH
> $y^{\text{ɦ}}$ɛ̀:qá

As a variant to [yi̱], the prefix [wǫ] occurs with the monosyllabic verbs [th+i] and [z+a]. In this case the high tone of the imperative morpheme does associate with the penultimate mora.

Examples:

[H wǫ][L z+a][HL] ##		"Come!"
>	HL	Mapping Convention
>	wʰǵ:zà	

[H wǫ][L th+i][HL] #		"Say ..."
>	HL	Mapping Convention
>	wʰóthì	

The toneless suffixal stabilizer [na ~ no] occurs with some monosyllabic verbs as an alternative to the prefixal [yi̱] or [wǫ]. This stabilizer effectively provides a mora with which the second tone of the imperative morpheme associates.

Examples:

[H m+ǫ][na][HL] ##		"Stop! Stand up!"
>	HL	Mapping Convention
>	mʱǫ́:nà	

[L sh+o][no][HL] ##		"Say so!"
>	shó:nò	

The pluralizing suffix in the imperative is [ni], toneless.

Examples:

[H wǫ][L z+a][ni][HL] ## "Come! (plural)"

> LLHL vide Root Tone Dissimilation, 4.4
> LHL Mapping Convention
> $w^{\mathring{n}}$ǫ́zá:nì

The negative imperative comprises the following morphemes:

$$\begin{bmatrix} HL \\ mʉsa \end{bmatrix} \left(\begin{bmatrix} \\ ni \end{bmatrix}\right) \begin{bmatrix} HL \\ \end{bmatrix} \# \begin{bmatrix} H \\ u \end{bmatrix}\begin{bmatrix} L \\ ku \end{bmatrix}\begin{bmatrix} \\ \text{verb stem} \end{bmatrix} \#$$

Examples:

$$\begin{bmatrix} HL \\ mʉsa \end{bmatrix}\begin{bmatrix} HL \\ \end{bmatrix} \# \begin{bmatrix} H \\ u \end{bmatrix}\begin{bmatrix} L \\ ku \end{bmatrix}\begin{bmatrix} H \\ m+\acute{a}^{*} \end{bmatrix} \#\#$$ "Don't stop! Don't stand up!"

> HLHLH Mapping Convention
> $m^{\mathring{n}}$ʉ́sà ' úkù:'má

$$\begin{bmatrix} HL \\ mʉsa \end{bmatrix}\begin{bmatrix} \\ ni \end{bmatrix}\begin{bmatrix} HL \\ \end{bmatrix} \# \begin{bmatrix} H \\ u \end{bmatrix}\begin{bmatrix} L \\ ku \end{bmatrix}\begin{bmatrix} H \\ h\acute{a}^{*}mb+a \end{bmatrix} \#\#$$ "Don't go! (plural)"

> LLHLHLH vide Root Tone Dissimilation, 4.4
> LHLHLHL Mapping Convention
> $m^{\mathring{n}}$ʉ̀sánì ' úkù'há:mbà

3.9 Non-Verbal Formatives

The traditional non-verbal prefixes to be discussed in this section form a natural syntactic class: they are the formatives that occur between the subject prefix and the copulative base which is a substantive (i.e. noun or pronoun). We shall refer to these as "non-verbal formatives". For reasons which will be clear below, these formatives must appear in derivations with a following word boundary which is removed later. In the following examples each type of formative is illustrated by one example:

Comparative Adverb

ú'njé'ŋgá:mì "He is like me" <

$$\begin{bmatrix} H \\ u \end{bmatrix}\begin{bmatrix} HL \\ njeŋga \end{bmatrix} \# \left(\begin{bmatrix} H \\ \end{bmatrix}\begin{bmatrix} L \\ mi \end{bmatrix}\right) \#\#$$

Associative Copulative

ú'nɦé'mɦǫ́:tò "He has a car" <

[H u][L nạ] #[H i][HL mǫto] ##

Instrumental Adverb

ú'ŋgò'fô: "It is at four o'clock" <

[Ḥ u][L ŋga] #[H u][HL foo] ##

Comparative Adverb

lísàmù:ntù "It is like a person" <

[H li][L sa] #[L mu][L ntu] ##

Identificative Copulative

ú'ŋgù'thî:'shá "He's a teacher" <

[H u][L ŋgu] #[H u][LH thisha] ##

Locative

bá'sé'khâ:yà "They are at home" <

[H ba][L se] # [H][ĤLL khaya] ##

Possessive

ú'ŋgò'wá:khò "She's yours" <

[H u][L ŋgu] #[H o] + [L u][L a] #([H][L kho]) ##

Justification for a Word Boundary

We require a word boundary following a non-verbal prefix because a word level tonal rule must still apply to the following word before it is joined to the formative.

Examples:

[H u][L yị] #[H ị][L si][LLL hlupheki] ## "He is a struggler"

>	$\overset{H}{u} + \overset{L}{y\underline{i}} \# \overset{H}{\underline{i}} + \overset{L}{si} + \overset{L\ L\ L}{hlupheki}$	Mapping Convention
>	$\overset{H}{u} + \overset{L}{y\underline{i}} \# \overset{L}{\underline{i}} + \overset{H}{si} + \overset{L\ L\ L}{hlupheki}$	vide Low Prefix Tone Shift, 4.6
>	$\overset{H}{u} + \overset{L}{y\underline{i}} \# \overset{L}{\underline{i}} + \overset{L}{si} + \overset{H\ L\ L}{hlupheki}$	vide Ante-Penultimate Tone Shift, 4.7
>	$\overset{H}{u} + y + \overset{L}{\underline{i}} + \overset{L}{si} + \overset{H\ L\ L}{hlupheki}$	Vowel Deletion and Mapping Convention
>	úy$^{\text{ɦ}}$i̱sì'hlúphè:kì	Penultimate Mora Creation etc.

Here is an example that illustrates the wrong results obtained when a morpheme boundary instead of a word boundary is placed after a non-verbal formative.

$\begin{bmatrix} H \\ u \end{bmatrix}\begin{bmatrix} L \\ sa \end{bmatrix} \quad \begin{bmatrix} LLL \\ ŋgulube \end{bmatrix} \# \#$ "He is like a pig"

>	$*\overset{H}{u} + \overset{L}{sa} + \overset{L\ L\ L}{ŋgulube}$	Mapping Convention
>	$*\overset{L}{u} + \overset{L}{sa} + \overset{H\ L\ L}{ŋgulube}$	vide Ante-Penultimate Tone Shift, 4.7
>	*úsà'ŋgúlù:bè	Penultimate Mora Creation etc.

The correct results are obtained when a word boundary occurs after the non-verbal formative:

$\begin{bmatrix} H \\ u \end{bmatrix}\begin{bmatrix} L \\ sa \end{bmatrix} \# \begin{bmatrix} LLL \\ ŋgulube \end{bmatrix} \#\#$ "He is like a pig"

> úsàŋgùlù:bè

Justification for Positing a Low Tone

Here is evidence that non-verbal formatives are underlyingly low toned. The non-verbal formative surfaces with a low tone when it co-occurs with the noun prefix alternant $[\overset{L}{u}]$ of class 1 (a)(see 3.1.3).

Examples:

[L nạ] # [L u][LH bani] ## "with whom?"
> LLH Mapping Convention
> nʰò bà:ní

cf. [L nạ] # [H u][LH zuka] ## "with a sixpence"
> HLH Mapping Convention
> nʰózù:'ká

In negative constructions and in complements to axiomatic negatives, where neither the pre-prefix nor the 'floating' high tone occurs, the non-verbal formative surfaces with a low tone.

Examples:

[L (k)ạ] # [L ku][L ŋgu] # [L ye][H] ## "t him"
> LLLH Mapping C n
> ạ̀kùŋgù:yé

(Notice the negative 'floating' tone first mentioned in 3.8.3).

cf. [L ŋgu] # ([H][L ye]) ## "It's him"
> HL Mapping Convention
> ŋgú:yè

[L (k)ạ] # [H ka][L na] # [HL mǫto] ## "He doesn't have a car"
> ạ̀kánà'mʰǫ́:tò

cf. [H u][L nạ] # [H i][HL mǫto] ## "He has a car"
> HHHL Mapping Convention
> ú'nʰé'mʰǫ́:tò

[L (k)ą] # [H ŋgi] [L y+a] [HL i] # # [L ku] # [L ba] [H thwa] # #
"I'm not going to any Bushmen whatsoever"
> LHHLLH Mapping Convention
> LHLHLLH Tone Epenthesis
> ąŋgî:'yí kùbà:thwá

cf. [L (k)ą] # [H ŋgi] [L y+a] [HL i] # # [ku] # [H] [L ba] [H thwa] # #
"I'm not going to the Bushmen"
> LHHHLH Mapping Convention
> LHLHHLH Tone Epenthesis
> ąŋgî:'yí ' kúbà:'thwá

The non-verbal suffix [$\overset{L}{sa}$] always surfaces with a low tone, because the noun following it occurs with the pre-prefix.

Example:

[H u] [L sa] # [L si] [LL lwane] # # "He is like a wild animal"
> úsàsìlwà:nè

The 'Pre-Prefixal' Floating High Tone

It is worth noting that in non-negative constructions, the complements to the non-verbal formatives manifest a floating high tone that is normally deleted in negative constructions. In the case of nouns, this tone may be associated with the vowel of the pre-prefix or it may float if the pre-prefix is deleted. The following table illustrates the structure of these complements in non-negative constructions:

Non-Verbal Formative # [$\overset{H}{(V)}$][(CV] - (noun)

Non-Verbal Formative # [^{H}][CV][na] - (absolute pronoun)

Non-Verbal Formative # [^{H}][CV(V)(CV)(CV)] - (demonstrative pronoun)

Non-Verbal Formative # [H][CV(V)(CV)(VV)] - (locative copulative demonstrative)

The segmental pre-prefix (but not its tone) deletes before 'possessive' [ka] and before the Locative formative. Let us illustrate the floating tone in all the complements above using the Locative formative [kú].

[L ku] # [H][HL mąma] ## "To mother" (noun)
> HHL Mapping Convention
> kú'mᶯ̊ǫ́:mà

[L ku] #([H][L ye]) ## "To her" (absolute pronoun)
> HL Mapping Convention
> kú:yè

[L ku] #([H][H lo]) ## "To this one" (demonstrative pronoun)
> HH Mapping Convention
> kú'ló (KwaZulu dialect)

[L ku] #([H][H nąa])[L ŋgu] ## "To this one"
> HHL Mapping Convention
> kú'nᶯ̊ǫ́:ŋgù

Other roots in Zulu with a similar floating high tone are the quantitative roots we saw in 3.7.0, and relative stems in demonstrative construction.

Examples:

[H u][L ye]([H][L dwa]) ## "He is on his own" (quantitative)
> HHL Mapping Convention
> ú'yé:dwà

[L ka] ([H][HL ŋgaka]) ## "so much" (relative in demonstrative construction)

> HHL Mapping Convention

> ká'ŋgá:kà

Verbal Morphemes in Copulative Construction

Some verbal morphemes occur also in the copulative construction. Sometimes different morpheme alternants occur in this construction:

Subject Prefix

The morpheme alternant $SP^{[L]}$ occurs in all negative copulative constructions excepting with [$\overset{L}{n\acute{a}}$] 'have' and [$\overset{L}{kh\acute{o}}$] 'there', where the verbal morpheme alternant $SP^{[H]}$ occurs.

(Remember that the negative suffixal floating tone introduced in 3.8.3 occurs in all stative tenses including stative tenses of copulatives).

Examples:

[L (k)ą] # [L ka][L na] # [L ye][H] # [H u][LL nina] ## "He is not with his mother"

> LLLHHLL Mapping Convention

> LLLLHLL vide Phrase Medial Final Tone Lowering, 4.10

> ąkànàyè únì:nà

[L (k)ą] # [L ba][LL qotho][H] ## "They are not honest"

> LLLH Mapping Convention

> ąbàqò:thó

Here examples with [$\overset{L}{n\acute{a}}$] 'have' and [$\overset{L}{kh\acute{o}}$] 'there', with the alternant $SP^{[H]}$:

$\begin{bmatrix}L\\(k)ą\end{bmatrix}$ # $\begin{bmatrix}H\\ka\end{bmatrix}\begin{bmatrix}L\\na\end{bmatrix}$ # $\begin{bmatrix}L\\ye\end{bmatrix}\begin{bmatrix}\\\end{bmatrix}$ # $\begin{bmatrix}H\\u\end{bmatrix}\begin{bmatrix}LL\\nina\end{bmatrix}$ ## "He doesn't have a mother"

> LHLHHLL Mapping Convention

> LHLLHLL vide Phrase Medial Final Tone Lowering, 4.9

> ąkánàyè'úní:nà

$\begin{bmatrix}L\\(k)ą\end{bmatrix}$ # $\begin{bmatrix}H\\ku\end{bmatrix}\begin{bmatrix}L\\kho\end{bmatrix}$ # $\begin{bmatrix}L\\mu\end{bmatrix}\begin{bmatrix}L\\ntu\end{bmatrix}$ ## "There is no one"

> ąkúkhò mù:ntù

The morpheme alternant $_{SP}[(C)^{HL}_{VV}]$ occurs in the stative participial in the copulative construction:

Example:

$\begin{bmatrix}HL\\uma\end{bmatrix}$ # $\begin{bmatrix}HL\\bee\end{bmatrix}\begin{bmatrix}L\\ki\end{bmatrix}$ # $\left(\begin{bmatrix}H\\\end{bmatrix}\begin{bmatrix}L\\thi\end{bmatrix}\right)$ # "If they are at our home"

> HLHLHL Mapping Convention

> úmà'bê:'kí:thì

The 'Progressive' Morpheme

The verbal progressive $[^{H}sa]$ has a morpheme alternant $[^{HL}see]$ in the copulative construction:

Example:

$\begin{bmatrix}H\\li\end{bmatrix}\begin{bmatrix}HL\\see\end{bmatrix}$ # $\begin{bmatrix}L\\ki\end{bmatrix}$ # $\left(\begin{bmatrix}H\\\end{bmatrix}\begin{bmatrix}L\\mi\end{bmatrix}\right)$ ## "I still have it"

> LHLLHL vide SP Dissimilation, 4.2

> LHLHL Mapping Convention

> lìsê:'kí:mì

Now let us list all the non-verbal formatives:

3.9.1 Adverbial Formatives (See Doke, 1927, paragraphs 607 - 619)

[HL njeŋga] - "like"
[HL ŋgaŋga] - "same size as"
[HLL kuuna] - "more than"
[L nā] - "and, with"
[L ŋgā] - "by means of"
[L sā] - "like"

However, there is an adverb of manner prefix [L kā], occurring with adjectival and relative stems, e.g.

[L ka][H hle] ## "well"
> kà:hlé

3.9.2 Identificative Copulative Formatives (see Doke 1927, paragraphs 537-564)

Excluding the [+ slack] initial vowels of most non-verbal constructions, which occur in copulative construction, the formatives [L yį̄ ~ L ngū ~ L wų̄] also occur. Many illustrations of copulatives have already been supplied in this study.

3.9.3 The Possessive Formatives (see Doke 1927, Chapter 9)

The possessive morpheme is made up of a low toned prefix segmentally identical to the subject prefix. This prefix is followed by a formative [L kā] in the case of a class 1(a) possessor; elsewhere it is followed by [L ā].

Examples:

[H i][L zi][H tha] - [L zi][L a] # ([H][L mi]) ## "My enemies"
> HLHHL Mapping Convention
> ízì'thá-'zá:mì

[H i][L si][HL thombe] - [L si][L ka] # [H][LH dudu] ##

"Dudu's picture"

> HLHLLHLH Mapping Convention

> ísì'thómbè - sì'kádù:'dú

The independent possessive morpheme is [H á, H é, H ó], with a variant [HL áá, HL éé, HL óó] which occurs with possessives derived from absolute pronouns.

Examples:

[H e][L li][L a] # ([H][L mi]) ## "mine" (class 5)

> HHL Mapping Convention

> é'lá:mì

[HL ee][L li][L a] # ([H][L mi]) ## "mine"

> HLHL Mapping Convention

> ê·'lá:mì

It is necessary to explain the boundary symbol "__" used in some of the above derivations. These possessive constructions behave tonally as compounds, just like noun compounds of the form úNkòsíbòmvú, ùMándlènkô:sì, etc. and a word boundary (#) at these points marked with "___" would lead to incorrect results, by allowing Phrase Medial Final Tone Lowering (see 4.10) to occur, whereas it does not.

3.9.4 Locative Formatives (see Doke 1927, paragraphs 577-592)

The Locative formatives are [L se ~ L so ~ L kù ~ L kì]. The locative pre-prefix [L ŋgá] 'near' may occur before the locative formative. The locative suffix [eni ~ ini], toneless, occurs with most nouns.

Example:

[L ŋga][L se] # [H][N][L dlu][ini] ## "Near the house"
> LHLL Mapping Convention
> ŋgàséndlì:nì

The locative formative [kwa̰], derives from the locative formative [kṵ] and the possessive formative [a̰].

[L ku] #[L a] #([H][L mi])## "At my place"
> HL Mapping Convention
> kwá:mì

3.10 The Conjunction, Interjection and Ideophone (see Doke 1927, Chapters 15 - 17)

Conjunctions and interjections surface with their inherent tones.

Examples:

[HL kodwa] ## "but"
> kódwà

[HL yẹbo] ## "yes"
> y$^{\hat{n}}$ẹ́:bò

The tone of the ideophone is complicated and it requires a special study which falls outside the scope of this analysis.

CHAPTER 4

4.0 PHONOLOGICAL TONE RULES

In Chapter 2 we discussed the Phonetic Realization Rules of Zulu. Such rules, which result in the surface tones of Zulu, apply after the phonological tone rules have applied.

In the introduction (see 0.5), we indicated that the tonal rules of Zulu (i.e. the phonological tone rules) are rules that regulate tonal prominence in order to

1. maintain the dominance hierarchy,
2. preserve penultimate syllable prominence,
3. supply information regarding the tonal class of a following root, and
4. avoid the creation of homophonous forms.

These functions will be discussed in detail as we discuss each phonological tone rule. Before presenting and discussing the phonological tone rules of Zulu, we would like to record our indebtedness to the following investigators for their pioneering work on some of the rules appearing in this Chapter:

1. D.M. Beach, for his contribution to our understanding of the rule we call Low Prefix Tone Shift, 4.6.
2. D.K. Rycroft, whose work on Zulu nouns first suggested to us the rule we call Ante-Penultimate Tone Shift, 4.7, and for some illuminating comments he makes on the process underlying what we term Low Prefix Tone Shift, 4.6.
3. A.T. Cope, who, we believe, was the first to suggest the rule Tonal Displacement, 4.11.

The phonological tone rules are here presented in the order of their application. A general principle that governs rule order in Zulu is that word rules i.e. rules not sensitive to phrase boundaries apply before phrase rules i.e. rules sensitive to phrase boundaries. The word rules apply from left to right following the hierarchical ordering of Zulu morphemes (see Dominance Hierarchy, 0.4) while the phrase rules applying phrase medially apply before those applying phrase finally.

NOTE: In this chapter derivations are fully specified with both tonal and segmental material in order to facilitate exposition and avoid confusion

4.1 Monosyllabic Verb Tone Dissimilation

$$H \longrightarrow L \;/\; \begin{Bmatrix} SP \\ OP \end{Bmatrix} [H(L)]\ [\ \underline{\quad}\ ]_{\text{verb root}}$$

Condition:
The verbal root must contain only one mora.

This rule states that the high tone on a monosyllabic verb stem dissimilates from the high tone of the subject prefix or object prefix to its immediate left.

Examples:

[L mą] # [H ba] [H sh+á*] [L e] ## "Let them burn"

> mą̀ + bá + sh + à + è — Monosyllabic Verb Tone Dissimilation

> mą̀ + bá + sh + è — Mapping Convention etc.

> m̂ąbá:shè — Penultimate Mora Creation etc.

[H ba] [L ya] [H mu] [H ph+á*] [a] ## "They do give him"

> $\overset{H}{ba} + \overset{L}{ya} + \overset{H}{mu} + ph + \overset{L}{a} + a$ — Monosyllabic Verb Tone Dissimilation

> báyà'mú:phà — Penultimate Mora Creation etc.

The following example illustrates that the rule applies even when the prefix has a $\overset{\frown}{HL}$ tone

$\begin{bmatrix} HL \\ uma \end{bmatrix} \# \begin{bmatrix} \overset{\frown}{HL} \\ e \end{bmatrix} \begin{bmatrix} H \\ f+\overset{*}{a} \end{bmatrix} \begin{bmatrix} \\ a \end{bmatrix} \#\#$ "If he should die"

> $\overset{H}{u}\overset{L}{ma} \# \overset{\frown}{\overset{H}{e}\overset{L}{}} + f + \overset{L}{a} + a$ — Monosyllabic Verb Tone Dissimilation

> úmà'ê:fà — Penultimate Mora Creation etc.

The following examples illustrate the application of this rule in negative constructions (in the first example it applies vacuously):

$\begin{bmatrix} L \\ (k)ą \end{bmatrix} \# \begin{bmatrix} H \\ ka \end{bmatrix} \begin{bmatrix} H \\ dl+\overset{*}{a} \end{bmatrix} \begin{bmatrix} HL \\ i \end{bmatrix} \#\#$ "He doesn't eat"

> $\overset{L}{ą} + \overset{H}{ka} + dl + \overset{L}{a} + \overset{HL}{i}$ — Monosyllabic Verb Tone Lowering

> $\overset{L}{ą} + \overset{H}{ka} + dl + \overset{LHL}{i}$ — Mapping Convention etc

> $\overset{L}{ą} + \overset{H}{ka} + dl + \overset{H}{i}$ — Mapping Convention

> $\overset{L}{ą} + \overset{H}{kaa} + dl + \overset{H}{i}$ — Penultimate Mora Creation

> $\overset{L}{ą} + \overset{HL}{kaa} + dl + \overset{H}{i}$ — Tone Epenthesis

> ąkâ:'dlí — Long Vowel Realization etc.

$\begin{bmatrix} L \\ (k)ą \end{bmatrix} \# \begin{bmatrix} H \\ ka \end{bmatrix} \begin{bmatrix} H \\ yi \end{bmatrix} \begin{bmatrix} H \\ dl+\overset{*}{a} \end{bmatrix} \begin{bmatrix} HL \\ i \end{bmatrix} \#\#$ "He doesn't eat it"

> $\overset{L}{ą} + \overset{H}{ka} + \overset{H}{yi} + dl + \overset{L}{a} + \overset{HL}{i}$ — Monosyllabic Verb Tone Lowering

> $\overset{L}{ą} + \overset{H}{ka} + \overset{HH}{yi} + dl + \overset{LL}{i}$ — Mapping Convention etc.

> $\overset{L}{ą} + \overset{H}{ka} + \overset{H}{yi} + dl + \overset{L}{i}$ — Mapping Convention

> ąká'yí:dlì — Penultimate Mora Creation etc.

Note, in the above example, that the high tone on the suffix [$\overset{HL}{i}$]]is mapped onto the penultimate mora of the word viz. the /i/ of the object prefix [$\overset{H}{yi}$], while the low tone becomes associated with this suffixal mora /i/. In the previous example, however, both the high tone and the low tone on the suffix [$\overset{HL}{i}$] became associated with the suffixal mora /i/. It was pointed out earlier (see 1.3.1) that the left most tone of a vowel suffix gets associated with the penultimate mora on condition that mora is part of the verbal stem or of the object prefix. In the previous example the penultimate mora is part of the subject prefix.

The Mapping Convention in this and many other examples, is in two steps: the first step associates tones in a construction with specific morae. This association takes place after the application of boundary removal and segmental rules - rules which fall outside the scope of the present study, and which are, therefore, not specified. The second step regulates a one to one association of tones and morae (see 1.3.1).

In the following example, the $\hat{HL}$ tone of [$\overset{\hat{HLL}}{i}$] also gets associated with the penultimate mora which happens to be the object prefix.

[H a][L ŋga] # [H yi][H dl+a*][$\hat{HLL}$ i] ##		"He shouldn't eat it"
>	H L H L $\hat{HLL}$ a + ŋga + yi + dl + a + i	Monosyllabic Verb Tone Dissimilation
>	H L H$\hat{HL}$ LL a + ŋga + yi + dl + i	Mapping Convention etc.
>	H L $\hat{HL}$ L a + ŋga + yi + dl + i	Mapping Convention
>	áŋgà'yî:dlì	Penultimate Mora Creation etc.

To get back to Monosyllabic Verb Tone Lowering, this rule applies to only one of the underlying deficient verbs which have become cliticized, viz. the exclusive

negative formative [$\overset{H}{ka}$](see 3.8.3).

Example:

$\begin{bmatrix} L \\ (k)ą \end{bmatrix}$ # $\begin{bmatrix} H \\ ba \end{bmatrix}\begin{bmatrix} H \\ ka \end{bmatrix}$ # $\begin{bmatrix} L \\ fik+a \end{bmatrix}\begin{bmatrix} \widehat{HL}L \\ i \end{bmatrix}$ ## "They have not yet arrived"

>	$\overset{L}{ą}$ # $\overset{H}{ba}$ + $\overset{L}{ka}$ # $\overset{L}{fik}$ + a + $\overset{\widehat{HL}L}{i}$	Monosyllabic Verb Tone Dissimilation
>	$\overset{L}{ą}$ + $\overset{H}{ba}$ + $\overset{L}{ka}$ + $\overset{L}{fik}$ + $\overset{\widehat{HL}L}{i}$	Mapping Convention etc.
>	$\overset{L}{ą}$ + $\overset{H}{ba}$ + $\overset{L}{ka}$ + $\overset{L}{fik}$ + $\overset{H}{i}$	Mapping Convention
>	ąbákàfì:'kí	Penultimate Mora Creation etc.

In the above example the left-most tone of the vowel suffix i.e. $\widehat{HL}$, is blocked from associating with the penultimate mora of the word, since such association would create homophonous forms and obliterate the distinction between high toned and low toned disyllabic verbs (see 0.5 and 1.3.1).

The examples above illustrate the application of Monosyllabic Verb Tone Dissimilation. In discussing the first phonological tone rule, we deemed it necessary to deviate and ascertain that the application of the Mapping Convention is well understood. We can now go back and end with a general comment on Monosyllabic Verb Tone Dissimilation.

This rule demonstrates the exceptional nature of one-mora high toned verbs. According to the dominance hierarchy (see 0.4), the high tone on the SP or OP should dissimilate from the high tone on these verbal stems since the latter are one higher in the dominance hierarchy. On the contrary, the high tone on the verbal stem dissimilates from that on the SP or OP. In phrase medial position, the lowering of the high tone on the verbal stem could have been handled

through the principle of penultimate syllable prominence (see 0.3.1). But this would fail to explain the lowering of the tone on the verbal stem in phrase final position. As we shall see when we study Subject Prefix Dissimilation (see 4.2) and Object Prefix Dissimilation (see 4.3), if a lexically monosyllabic verbal stem is extended to have more than one mora, then the high tone on the prefix dissimilates from the high tone on the verbal stem. This leads us to one conclusion, that the dissimilation of the high tone on a one-mora verb from that on a SP or OP demonstrates the exceptional nature of one-mora verbs. This rule applies before all other phonological tone rules since it violates the general functional motivation of the other rules.

4.2 Subject Prefix Dissimilation

$$H \longrightarrow L \;/\; [\underline{\quad}]_{SP}\,[\,H\,]_{\substack{\text{verb}\\\text{root}}}$$

Condition:
The rule does not apply to verbal constructions with either of the suffixes [ile] or [$\overset{H}{e}$], or to the conditional verb [$\eta g\overset{H}{a}$ ~ $\eta g\overset{HL}{ee}$] in the participial.

The rule states that the high tone of a subject prefix dissimilates from the high tone on an adjacent verbal root.

Example:

$\begin{bmatrix}HL\\uma\end{bmatrix}$ # $\begin{bmatrix}H\\e\end{bmatrix}\begin{bmatrix}H\\jabul^{*}+a\end{bmatrix}\begin{bmatrix}\\a\end{bmatrix}$ ## "If he's happy"

> $\overset{H\ L}{uma}$ # $\overset{L}{e}$ + $jab\overset{H}{u}l$ + a + a — SP Dissimilation

> $\overset{H\ L}{uma}$ # $\overset{L}{e}$ + $\overset{L\ H}{jabul}$ + $\overset{L}{a}$ — Mapping Convention etc.

> úmà èjà'bú:là — Penultimate Mora Creation etc.

The following example illustrates that Subject Prefix Dissimilation applies to monosyllabic verb roots which have gained an extra mora or morae through suffixation.

$\begin{bmatrix} L \\ (k)ą \end{bmatrix} \# \begin{bmatrix} H \\ ku \end{bmatrix} \begin{bmatrix} H \\ dl+a^{*} \end{bmatrix} \begin{bmatrix} \\ ek+a \end{bmatrix} \begin{bmatrix} HL \\ i \end{bmatrix} \# \#$	"It is not edible"
> $\overset{L}{ą} + \overset{L}{ku} + dl + \overset{H}{a} + ek + a + \overset{HL}{i}$	SP Dissimilation
> $\overset{L}{ą} + \overset{L}{ku} + dl + \overset{L}{a} + ek + a + \overset{HL}{i}$	vide Root Tone Dissimilation, 4.4
> $\overset{L}{ą} + \overset{L}{ku} + dl + \overset{LH}{ek} + \overset{L}{i}$	Mapping Convention etc.
> $\overset{L}{ą} + \overset{L}{ku} + dl + \overset{H}{ek} + \overset{L}{i}$	Mapping Convention
> ąkùdlé:kì	Penultimate Mora Creation etc.

The high tone in the verbal stem must be a root high tone, otherwise the rule does not apply, as in the following example

$\begin{bmatrix} L \\ (k)ą \end{bmatrix} \# \begin{bmatrix} H \\ ku \end{bmatrix} \begin{bmatrix} L \\ mb+a \end{bmatrix} \begin{bmatrix} \\ ek+a \end{bmatrix} \begin{bmatrix} HL \\ i \end{bmatrix} \# \#$	"It cannot be dug"
> $\overset{L}{ą} + \overset{H}{ku} + mb + \overset{LH}{ek} + \overset{L}{i}$	Mapping Convention etc.
> $\overset{L}{ą} + \overset{H}{ku} + mb + \overset{H}{ek} + \overset{L}{i}$	Mapping Convention
> ąkú'mbé:kì	Penultimate Mora Creation etc.

This rule also accounts for the lowering of the high tone on the subject prefix morpheme when it is adjacent to the high toned deficient verbs [$\overset{H}{sa}$], [$\overset{H}{se}$], [$\overset{H}{be}$], [$\overset{HL}{boo}$], etc. (see 3.8.2).

Example:

$\begin{bmatrix} H \\ ba \end{bmatrix} \begin{bmatrix} H \\ sa \end{bmatrix} \# \begin{bmatrix} L \\ gez+a \end{bmatrix} \begin{bmatrix} \\ a \end{bmatrix} \# \#$	"They are still washing"
> $\overset{L}{ba} + \overset{H}{sa} \# \overset{L}{gez} + a + a$	SP Dissimilation

> $\overset{L}{ba} + \overset{H}{sa} + \overset{L}{gez} + \overset{L}{a}$ Mapping Convention etc.

> bàságè:zà Penultimate Mora Creation etc.

SP Dissimilation applies to the conditional deficient verb [$\overset{H}{ŋga}$ ~ $\overset{HL}{ŋgee}$] in the principal sub-mood, but not in the participial.

Examples:

$\begin{bmatrix}H\\a\end{bmatrix}\begin{bmatrix}H\\ŋga\end{bmatrix} \# \begin{bmatrix}L\\gxum+a\end{bmatrix}\begin{bmatrix}a\end{bmatrix} \#\#$ "He can jump" (principal)

> $\overset{L}{a} + \overset{H}{ŋga} \# \overset{L}{gxum} + a + a$ SP Dissimilation

> $\overset{L}{a} + \overset{H}{ŋga} + \overset{L}{gxum} + \overset{L}{a}$ Mapping Convention etc.

> àŋgágxù:mà Penultimate Mora Creation etc.

$\begin{bmatrix}H\\ba\end{bmatrix}\begin{bmatrix}HL\\ŋgee\end{bmatrix} \# \begin{bmatrix}L\\wel+a\end{bmatrix}\begin{bmatrix}HL\\e\end{bmatrix} \#\#$ "They can't cross" (principal)

> $\overset{L}{ba} + \overset{HL}{ŋgee} \# \overset{L}{wel} + a + \overset{HL}{e}$ SP Dissimilation

> $\overset{L}{ba} + \overset{HL}{ŋgee} + \overset{LH}{wel} + \overset{L}{e}$ Mapping Convention etc.

> $\overset{L}{ba} + \overset{HL}{ŋgee} + \overset{H}{wel} + \overset{L}{e}$ Mapping Convention

> bàŋgê:'wé:lè Penultimate Mora Creation etc.

$\begin{bmatrix}HL\\uma\end{bmatrix} \# \begin{bmatrix}H\\e\end{bmatrix}\begin{bmatrix}H\\ŋga\end{bmatrix} \# \begin{bmatrix}L\\gxum+a\end{bmatrix}\begin{bmatrix}a\end{bmatrix} \#\#$ "If he can jump" (participial)

> $\overset{H\ L}{uma} \# \overset{H}{e} + \overset{H}{ŋga} + \overset{L}{gxum} + \overset{L}{a}$ Mapping Convention etc.

> úmà ' é'ŋgágxù:mà Penultimate Mora Creation etc.

$\begin{bmatrix}HL\\nǫma\end{bmatrix} \# \begin{bmatrix}H\\be\end{bmatrix}\begin{bmatrix}HL\\ŋgee\end{bmatrix} \# \begin{bmatrix}L\\wel+a\end{bmatrix}\begin{bmatrix}HL\\e\end{bmatrix} \#\#$ "Even though they can't cross" (participial)

>	$\overset{H\ L}{nǫma}$ # $\overset{H}{be}$ + $\overset{HL}{ŋgee}$ + $\overset{LH}{wel}$ + $\overset{L}{e}$	Mapping Convention etc.
>	$\overset{H\ L}{nǫma}$ # $\overset{H}{be}$ + $\overset{HL}{ŋgee}$ + $\overset{H}{wel}$ + $\overset{L}{e}$	Mapping Convention
>	$n^{h}ǫ́mà$ ' bé'ŋgê:'wé:lè	Penultimate Mora Creation etc.

The past/stative principal with the suffix [ile], toneless, and the subjunctive with the suffix [$\overset{H}{e}$], are distinguished from the past/stative participial with the suffix [$\overset{HL}{ile}$] and the past with the suffix [$\overset{HL}{\underline{\underline{ee}}}$] respectively, by the failure of SP Dissimilation to apply to the former pair of constructions.

Examples:

$\begin{bmatrix}H\\li\end{bmatrix}\begin{bmatrix}H\\m+\overset{*}{a}\end{bmatrix}\begin{bmatrix}\\ile\end{bmatrix}$ ## "It stopped" (past principal)

>	$\overset{H}{li}$ + m + $\overset{H\ L}{ile}$	Mapping Convention etc.
>	lí'mí:lè	
⊁	*lìmí:lè	

cf. $\begin{bmatrix}HL\\um\end{bmatrix}$ # $\begin{bmatrix}H\\li\end{bmatrix}\begin{bmatrix}H\\m+\overset{*}{a}\end{bmatrix}\begin{bmatrix}\widehat{HL}\,L\\ile\end{bmatrix}$ ## "If it has stopped" (past participial)

>	$\overset{H\ L}{uma}$ # $\overset{L}{li}$ + m + $\overset{H}{a}$ + $\overset{\widehat{HL}\ L}{ile}$	SP Dissimilation
>	$\overset{H\ L}{uma}$ # $\overset{L}{li}$ + m + $\overset{L}{a}$ + $\overset{\widehat{HL}\ L}{ile}$	vide Root Tone Dissimilation, 4.4
>	$\overset{H\ L}{uma}$ # $\overset{L}{li}$ + m + $\overset{L\widehat{HL}\ L}{ile}$	Mapping Convention etc.
>	$\overset{H\ L}{uma}$ # $\overset{L}{li}$ + m + $\overset{\widehat{HL}\ L}{ile}$	Mapping Convention
>	úmà lì'mî:lè	Penultimate Mora Creation etc.

$\begin{bmatrix}L\\ŋgi\end{bmatrix}\begin{bmatrix}H\\f\overset{*}{u}n+a\end{bmatrix}\begin{bmatrix}\\a\end{bmatrix}$ # $\begin{bmatrix}H\\li\end{bmatrix}\begin{bmatrix}H\\bon+a\end{bmatrix}\begin{bmatrix}H\\e\end{bmatrix}$ ## "I want it to see" (subjunctive)

>	$\overset{L}{ŋgi}$ + $\overset{H}{fun}$ + a + a # $\overset{H}{li}$ + $\overset{L}{bon}$ + a + $\overset{H}{e}$	vide Root Tone Dissimilation, 4.4

> L H L H L H
> ŋgi + fun + a # li + bon + e — Mapping Convention etc.

> ŋgìfúnà ' líbò:'né — Penultimate Mora Creation etc.

⊁ *ŋgìfúnà lìbò:né

cf. [H][H *][HL][LH] li][bon+a][ee]# [bani] ## "Whom did it see?" (past)

> L H HL L H
> li + bon + a + ee # bani — SP Dissimilation

> L L HL L H
> li + bon + a + ee # bani — vide Root Tone Dissimilation, 4.4

> L L HL L H
> li + bon + ee # bani — Mapping Convention etc.

> lìbònêe: bà:'ní — Penultimate Mora Creation etc.

Functionally, SP Dissimilation adjusts tonal prominence on adjacent SP and verbal root morphemes in favour of the verbal root - the morpheme higher in the dominance hierarchy.

4.3 Object Prefix Dissimilation

$$H \longrightarrow L \;/\; \left\{ \begin{matrix} H \\ ku^{L} \\ ya^{L} \end{matrix} \right\} \quad [_{OP} ____] [_{\text{verb root}} \; H \;]$$

The rule states that the high tone on the object prefix dissimilates to the high tone on an adjacent verbal root, if a high tone or [ku^{L}] or [ya^{L}] appears to the left of the object prefix. Notice that this rule is the same as SP Dissimilation except for the condition of the terms to the left.

Examples:

[L][H][H][H *][HL] (k)a][si][ba][thand+a][i] ## "We don't like them"

>	$\overset{L}{ą} + \overset{H}{si} + \overset{L}{ba} + \overset{H}{thand} + a + \overset{HL}{i}$	OP Dissimilation
>	$\overset{L}{ą} + \overset{H}{si} + \overset{L}{ba} + \overset{L}{thand} + a + \overset{HL}{i}$	vide Root Tone Dissimilation, 4.4
>	$\overset{L}{ą} + \overset{H}{si} + \overset{L}{ba} + \overset{LH}{thand} + \overset{L}{i}$	Mapping Convention etc.
>	$\overset{L}{ą} + \overset{H}{si} + \overset{L}{ba} + \overset{H}{thand} + \overset{L}{i}$	Mapping Convention
>	ąsíbà'thá:ndì	Penultimate Mora Creation etc.

$\begin{bmatrix}H\\u\end{bmatrix}\begin{bmatrix}L\\ku\end{bmatrix}\begin{bmatrix}H\\bu\end{bmatrix}\begin{bmatrix}H\\\overset{*}{phuz}+a\end{bmatrix}$ ## "To drink it"

>	$\overset{H}{u} + \overset{L}{ku} + \overset{L}{bu} + \overset{H}{phuz} + a$	OP Dissimilation
>	$\overset{H}{u} + \overset{L}{ku} + \overset{L}{bu} + \overset{H}{phuz} + \overset{L}{a}$	Mapping Convention etc.
>	$\overset{L}{u} + \overset{H}{ku} + \overset{L}{bu} + \overset{H}{phuz} + \overset{L}{a}$	vide Low Prefix Tone Shift, 4.6
>	ùkúbù'phú:zà	Penultimate Mora Creation etc.

$\begin{bmatrix}H\\ba\end{bmatrix}\begin{bmatrix}L\\ya\end{bmatrix}\begin{bmatrix}H\\bu\end{bmatrix}\begin{bmatrix}H\\phuz+a\end{bmatrix}\begin{bmatrix}\\a\end{bmatrix}$ ## "They drink it"

>	$\overset{H}{ba} + \overset{L}{ya} + \overset{L}{bu} + \overset{H}{phuz} + a + a$	OP Dissimilation
>	$\overset{H}{ba} + \overset{L}{ya} + \overset{L}{bu} + \overset{H}{phuz} + \overset{L}{a}$	Mapping Convention etc.
>	$\overset{L}{ba} + \overset{H}{ya} + \overset{L}{bu} + \overset{H}{phuz} + \overset{L}{a}$	vide Low Prefix Tone Shift, 4.6
>	bàyábù'phú:zà	

If a low toned morpheme other than [$\overset{L}{ku}$] or [$\overset{L}{ya}$] appears to the immediate left of the object prefix, then OP Dissimilation does not apply.

Example:

$\begin{bmatrix}H\\a\end{bmatrix}\begin{bmatrix}L\\ŋga\end{bmatrix}$ # $\begin{bmatrix}H\\bu\end{bmatrix}\begin{bmatrix}H\\phuz+a\end{bmatrix}\begin{bmatrix}\widehat{HLL}\\i\end{bmatrix}$ ## "He mustn't drink it"

>	$\overset{H}{a} + \overset{L}{ŋga} + \overset{H}{bu} + \overset{L}{phuz} + a + \overset{\widehat{HLL}}{i}$	vide Root Tone Dissimilation

> $\overset{H}{a} + \eta g\overset{L}{a} + \overset{H}{b}\overset{L}{u} + ph\overset{LH\hat{L}}{u}z + \overset{L}{i}$ Mapping Convention etc.

> $\overset{H}{a} + \eta g\overset{L}{a} + \overset{H}{b}\overset{L}{u} + ph\overset{H\hat{L}}{u}z + \overset{L}{i}$ Mapping Convention

> áŋgà'bú'phû:zì

OP Dissimilation also differs from SP Dissimilation in not having the same exceptions as the latter: OP Dissimilation will apply to the past/stative principal with [ile]. In the case of the subjunctive with OP, the suffix is not $[\overset{H}{e}]$, but $[\overset{H\hat{L}L}{e}]$, and OP Dissimilation takes place.

Examples:

$\begin{bmatrix} H \\ u \end{bmatrix}\begin{bmatrix} H \\ li \end{bmatrix}\begin{bmatrix} H \\ dl+\overset{*}{a} \end{bmatrix}\begin{bmatrix} \\ ile \end{bmatrix}$ ## "He has eaten it"

> $\overset{H}{u} + \overset{L}{li} + dl + \overset{H}{a} + ile$ OP Dissimilation

> $\overset{H}{u} + \overset{L}{li} + dl + \overset{H\ L}{ile}$ Mapping Convention

> úlì'dlí:lè

Compare the example above with the derivation of /ú'dlí:lè/ "he has eaten" supplied in 4.2

$\begin{bmatrix} L \\ \eta gi \end{bmatrix}\begin{bmatrix} H \\ \overset{*}{fun}+a \end{bmatrix}\begin{bmatrix} \\ a \end{bmatrix}$ # $\begin{bmatrix} H \\ ba \end{bmatrix}\begin{bmatrix} H \\ li \end{bmatrix}\begin{bmatrix} H \\ \overset{*}{bon}+a \end{bmatrix}\begin{bmatrix} \hat{HLL} \\ e \end{bmatrix}$ ## "I want them to see it"

> $\overset{L}{\eta gi} + \overset{H}{fun} + a + a \# \overset{H}{ba} + \overset{L}{li} + \overset{H}{bon} + a + \overset{\hat{HLL}}{e}$
OP Dissimilation

> $\overset{L}{\eta gi} + \overset{H}{fun} + a + a \# \overset{H}{ba} + \overset{L}{li} + \overset{L}{bon} + a + \overset{\hat{HLL}}{e}$
vide Root Tone Dissimilation, 4.4

> $\overset{L}{\eta gi} + \overset{H}{fun} + \overset{L}{a} \# \overset{H}{ba} + \overset{L}{li} + \overset{L\hat{L}L}{bon} + \overset{L}{e}$
Mapping Convention etc.

> $\overset{L}{\eta gi} + \overset{H}{fun} + \overset{L}{a} \# \overset{H}{ba} + \overset{L}{li} + \overset{\hat{HL}}{bon} + \overset{L}{e}$
Mapping Convention

> ŋgìfúnà ' bálì'bô:nè

Compare the example above with the derivation of /ŋgìfúnà ' líbò:'né/ "I want it to see" supplied in 4.2.

As the rule of OP Dissimilation is formulated above, the high tone on the root from which the OP dissimilates, is the underlying high tone. However, most dialects of Zulu have re-interpreted low toned verbs that acquire a penultimate high tone through suffixation of $\hat{HLL}$ or HL suffixes such as $[^{\hat{HLL}}\text{e}]$ (subjunctive alternant) and $[^{HL}\text{i}]$ (principal, present, negative) (see Mapping Convention, 1.3.1) as if they contained an underlying root high tone and so OP Dissimilation applies. Nevertheless, a minority dialect of Zulu spoken mostly by older people sticks to the rule as formulated above:

Examples:

$[^{L}_{(k)ą}] \# [^{H}_{ka}][^{H}_{ba}][^{L}_{hlek+a}][^{HL}_{i}] \# \#$ "He doesn't laugh at them"

> $^{L}ą + ka^{H} + ba^{H} + hlek^{LH} + i^{L}$ Mapping Convention etc.

> $^{L}ą + ka^{H} + ba^{H} + hlek^{H} + i^{L}$ Mapping Convention

> ąkáˈbáˈhlé:kì

Compare the derivation in the other dialect:

$[^{L}_{(k)ą}] \# [^{H}_{ka}][^{H}_{ba}][^{L}_{hlek+a}][^{HL}_{i}] \# \#$ "He doesn't laugh at them"

> $^{L}ą + ka^{H} + ba^{H} + hlek^{LH} + i^{L}$ Mapping Convention etc.

> $^{L}ą + ka^{H} + ba^{H} + hlek^{H} + i^{L}$ Mapping Convention

> $^{L}ą + ka^{H} + ba^{L} + hlek^{H} + i^{L}$ OP Dissimilation

> ąkábàˈhlé:kì Penultimate Mora Creation etc.

Functionally, OP Dissimilation adjusts tonal prominence on adjacent OP and verbal root morphemes in favour of the verbal root - the morpheme higher in the dominance hierar hy.

4.4 Root Tone Dissimilation

H ⟶ L / [____] [H]
verb root — suffix

This rule states that the high tone on the verbal root dissimilates from the high tone on the adjacent suffix.

Example:

[L (k)ą] # [H si] [H ba] [H bón+a] [HL aŋga] # # "We didn't see them"

>	L H L H H L ą + si + ba + bon + a + aŋga	OP Dissimilation
>	L H L L H L ą + si + ba + bon + a + aŋga	Root Tone Dissimilation
>	ąsíbàbò'ná:ŋgà	

With high-toned stems occurring with one-mora suffixes associated with two tones Root Tone Dissimilation sometimes has no overt effect in the surface structure.

Example:

[L (k)ą] # [H ka] [H bón+a] [HL i] # # "He doesn't see"

>	L L H HL ą + ka + bon + a + i	SP Dissimilation
>	L L L HL ą + ka + bon + a + i	Root Tone Dissimilation
>	L L LH L ą + ka + bon + i	Mapping Convention etc.
>	L L H L ą + ka + bon + i	Mapping Convention
>	ąkàbó:nì	Penultimate Mora Creation etc.

Functionally, Root Tone Dissimilation adjusts tonal prominence on an adjacent verbal root and suffix in favour of the suffix - the morpheme higher in the dominance hierarchy.

4.5 Shift to Disyllabic Low

This rule applies in two domains and we shall present them separately at first:

1st Domain: High Shift from Prefix to Stem

	[H]	[L L]	
Verb	Prefix	Stem	Verb
	1	2 3	
→	Ø	1 3	

2nd Domain: High Shift from Stem to Suffix

	[H]	[L L]	
Verb	Stem	Suffix	Verb
	1	2 3	
→	Ø	1 3	

Condition: The stem is disyllabic or shorter.

The rules apply to the high tone on disyllabic or monosyllabic verbal stems or to the high tone on a prefix, and shift them to the first mora of a low-toned disyllabic suffix or to the first mora of a low-toned disyllabic verb, respectively. In effect these rules shift an ante-penultimate high tone to penultimate position. Viewed differently, these rules shift a high tone one place higher in the dominance hierarchy. Since the same process is involved in both domains, we should attempt to collapse the above rules. The concept of dominance hierarchy facilitates this restatement:

$$\underset{\text{Verb}}{\Big[}\Big[\ \overset{1}{H}\ \Big]\Big[\ \overset{2}{L}\ \overset{3}{L}\ \Big]\underset{\text{Verb}}{\Big]}$$

$$\rightarrow \emptyset \qquad 1\ 3$$

Conditions: (i) Term 1 is lower in the dominance hierarchy than term 2.

(ii) The stem or prefix with which term 1 is associated is not longer than disyllabic.

Examples:

$$\begin{bmatrix} HL \\ uma \end{bmatrix} \# \begin{bmatrix} H \\ e \end{bmatrix}\begin{bmatrix} L \\ hlek+a \end{bmatrix}\begin{bmatrix} \\ a \end{bmatrix} \#\# \quad \text{"If he's laughing"}$$

$$> \quad \overset{H}{u}\overset{L}{ma} \# \overset{H}{e} + hl\overset{L}{e}k + \overset{L}{a} \qquad \text{Mapping Convention etc.}$$

$$> \quad \overset{H}{u}\overset{L}{ma} \# \overset{L}{e} + hl\overset{H}{e}k + \overset{L}{a} \qquad \text{Shift to Disyllabic Low}$$

$$> \quad \text{úmà è'hlé:kà} \qquad \text{Penultimate Mora Creation etc.}$$

$$\begin{bmatrix} H \\ ba \end{bmatrix}\begin{bmatrix} H \\ hamb+a \end{bmatrix}\begin{bmatrix} \\ ile \end{bmatrix} \#\# \quad \text{"They've left"}$$

$$> \quad \overset{H}{ba} + \overset{H}{hamb} + \overset{L}{i}\overset{L}{le} \qquad \text{Mapping Convention etc.}$$

$$> \quad \overset{H}{ba} + \overset{L}{hamb} + \overset{H}{i}\overset{L}{le} \qquad \text{Shift to Disyllabic Low}$$

$$> \quad \text{báhà'mbí:lè}$$

A high tone on a morpheme not one lower in the dominance hierarchy does not shift.

Example:

$$\begin{bmatrix} L \\ ɥ \end{bmatrix}\begin{bmatrix} H \\ sa \end{bmatrix} \# \begin{bmatrix} L \\ gez+a \end{bmatrix}\begin{bmatrix} \\ a \end{bmatrix} \#\# \quad \text{"You are still washing"}$$

$$> \quad \overset{L}{ɥ} + \overset{H}{sa} + \overset{L}{gez} + \overset{L}{a} \qquad \text{Mapping Convention etc.}$$

$$> \quad ɥ\text{ságè:zà}$$

If the verbal stem is trisyllabic, then the high tone does not shift onto the low disyllabic suffix. In this instance, the rule fails to apply because Zulu

has the following constraint on the position of the high tone on quadrisyllabic or longer verbal stems that would result from suffixation: <u>the stem high tone may occur on the ante-penultimate syllable only</u> (see Ante-Penultimate Tone Shift, 4.7).

Example:

$\begin{bmatrix} H \\ u \end{bmatrix}\begin{bmatrix} H \\ jabúl+a \end{bmatrix}\begin{bmatrix} \\ ile \end{bmatrix}$ ## "He was happy"

> $\overset{H}{u} + \overset{L\ H}{jabúl} + \overset{L\ L}{ile}$ Mapping Convention etc.

> újà'búlì:lè

This rule also fails to apply to the handful of $\overset{L}{CVC}$+V verbal stems which were exceptional in the imperative in having two alternate surface forms (see 3.8.4).

Example:

$\begin{bmatrix} HL \\ uma \end{bmatrix}$ # $\begin{bmatrix} H \\ be \end{bmatrix}\begin{bmatrix} L \\ hlal+a \end{bmatrix}\begin{bmatrix} \\ a \end{bmatrix}$ ## "If they sit"

> $\overset{H\ L}{uma}$ # $\overset{H}{be} + \overset{L}{hlal} + \overset{L}{a}$ Mapping Convention etc.

> úmà ' béhlà:là

Functionally, Shift to Disyllabic Low regulates tonal prominence by shifting it to the morpheme higher in the dominance hierarchy.

4.6 <u>Low Prefix Tone Shift</u>

$$[\ H\ ] + \left\{ \begin{matrix} \overset{L}{ya} \\ (L) \\ NPr \end{matrix} \right\} + [L\ .....]$$

1	2	3
→ ∅	1	3

Condition:
If term 2 is [+ slack], then the rule does not apply if term 3 is a high-toned trisyllabic or longer stem.

The rule states that a high tone on the morpheme to the immediate left shifts to [$\overset{L}{ya}$] or to the low-toned basic noun prefix, if the second morpheme is followed by a low tone.

Examples:

$\begin{bmatrix} H \\ a \end{bmatrix}\begin{bmatrix} L \\ ba \end{bmatrix}\begin{bmatrix} L \\ ntu \end{bmatrix}$ ## "people"

> $\overset{L}{a} + \overset{H}{ba} + \overset{L}{ntu}$ — Low Prefix Tone Shift etc.

> àbá:ntù — Penultimate Mora Creation etc.

$\begin{bmatrix} H \\ i \end{bmatrix}\begin{bmatrix} L \\ si \end{bmatrix}\begin{bmatrix} LH \\ godi \end{bmatrix}$ ## "district"

> $\overset{L}{i} + \overset{H}{si} + \overset{L\,H}{godi}$ — Low Prefix Tone Shift etc.

> ìsígò:'dí — Penultimate Mora Creation etc.

$\begin{bmatrix} H \\ u \end{bmatrix}\begin{bmatrix} L \\ ya \end{bmatrix}\begin{bmatrix} L \\ lw+a \end{bmatrix}\begin{bmatrix} \\ a \end{bmatrix}$ ## "He is fighting"

> $\overset{H}{u} + \overset{L}{ya} + lw + \overset{L}{a}$ — Mapping Convention etc.

> $\overset{L}{u} + \overset{H}{ya} + lw + \overset{L}{a}$ — Low Prefix Tone Shift

> ùyá:lwà

$\begin{bmatrix} H \\ ba \end{bmatrix}\begin{bmatrix} L \\ ya \end{bmatrix}\begin{bmatrix} L \\ bhed+a \end{bmatrix}\begin{bmatrix} \\ a \end{bmatrix}$ ## "They are talking nonsense"

> $\overset{H}{ba} + \overset{L}{ya} + \overset{L}{bhed} + \overset{L}{a}$ — Mapping Convention etc.

> $\overset{L}{ba} + \overset{H}{ya} + \overset{L}{bhed} + \overset{L}{a}$ — Low Prefix Tone Shift

> bàyábhè:dà

Trisyllabic or longer stems require special discussion. Firstly, with low-toned stems, Ante-Penultimate Tone Shift applies after Low Prefix Tone Shift, shifting the already shifted high tone further to the right, to the ante-penultimate syllable (see 4.7).

Examples:

[H a][L ma][LLLLL qebelengwane] # # "mealie meal cakes"

> L H L L L L L
> a + ma + qebelengwane — Low Prefix Tone Shift etc.

> L L L L H L L
> amaqebelengwane — vide Ante-Penultimate Tone Shift, 4.7

> àmàqèbèlénggwà:nè — Penultimate Mora Creation etc.

[H ba][L ya][L hlabelel+a][ ] # # "They are singing"

> H L L L L L
> ba + ya + hlabelel + a — Mapping Convention etc.

> L H L L L L
> ba + ya + hlabelel + a — Low Prefix Tone Rule

> L H L H L L
> ba + ya + hlabelel + a — vide Ante-Penultimate Tone Shift, 4.7

> bàyàhlàbélè:là — Penultimate Mora Creation etc.

Secondly, with high-toned stems, Low Prefix Tone Shift applies if the second morpheme is [- slack].

Examples:

[H i][L si][LHL phambano] # # "cross"

> L H L H L
> i + si + phambano — Low Prefix Tone Shift

> ìsíphà'mbá:nò — Penultimate Mora Creation

[H u][L ya][H sebenz+a][a] # # "He is working"

> H L L H L
> u + ya + sebenz + a — Mapping Convention etc.

> L H L H L
> u + ya + sebenz + a — Low Prefix Tone Rule

> ùyásè'bé:nzà — Penultimate Mora Creation

If, however, the second morpheme is [+ slack], then Low Prefix Tone Shift is blocked.

Example:

[H i][L zi][LHL phambano] ## "crosses"

> H L L H L
> i + zi + phambano — Mapping Convention

> ízìphà'mbá:nò — Penultimate Mora Creation etc.

Low Prefix Tone Shift is blocked in the example above so as to block Tonal Displacement (see 4.11), which would shift a prefix high tone into a high-toned stem.

An apparent exception to the blocking of Low Prefix Tone Shift is in forms like /ìzígò'jánà/, where the high tone of the pre-prefix has shifted. However, at an earlier stage in the derivation of this form we, in fact, have a disyllabic stem [L H godi] "districts", which does not block the rule:

[H i][L zi][LH godi][ana] ## "small districts"

> L H L H
> i + zi + godi + ana — Low Prefix Tone Shift

> L H L H L
> i + zi + goj + ana — Mapping Convention etc

> ìzígò'jé:nà — Penultimate Mora Creation

The derivation illustrates that some type of boundary occurs between the root and diminutive suffix which excludes the suffix from the scope of the first application of the rule. We will not explore the implication of this further.

The function of Low Prefix Tone Rule is to give information about the tonal class of the stem. And it does give accurate information about the most important stem in Zulu tonology, viz. the disyllabic verb stem. A low-toned /ya/ indicates a high stem while a high-

toned /ya/ indicates a low stem. With non-verbal disyllabic stems and all trisyllabic or longer stems, the rule tells us only that the stem-initial syllable is low-toned. The derived low tone of the OP also triggers the shift.

1.- Ante-Penultimate Tone Shift

	H	(L_o)	L	L	L	#
	1	(2)	3	4	5	
→	∅	(2)	1	4	5	

Conditions:

1. This rule will apply if term 5 is a high tone, so long as it is a suffixal high tone.
2. The last three tones must be part of the stem.
3. In copulative constructions, the rule applies before the removal of the internal word boundary.

The rule states that if the last three syllables of a stem are low-toned, the first high tone to the left will shift onto the ante-penultimate syllable.

Examples:

$\begin{bmatrix}HL\\uma\end{bmatrix}$ # $\begin{bmatrix}H\\e\end{bmatrix}\begin{bmatrix}L\\gijim+a\end{bmatrix}\begin{bmatrix}\\a\end{bmatrix}$ #;# "If he runs"

> H L H L L L
> uma # e + gijim + a — Mapping Convention etc.
>
> H L L H L L
> uma # e + gijim + a — Ante-Penultimate Tone Shift
>
> > úmà è'gíjì:mà

$\begin{bmatrix}H\\i\end{bmatrix}\begin{bmatrix}L\\si\end{bmatrix}\begin{bmatrix}LLLL\\phukuphuku\end{bmatrix}$ ## "fool"

> L H L L L L
> i + si + phukuphuku — Low Prefix Tone Shift
>
> L L L H L L
> i + si + phukuphuku — Ante-Penultimate Tone Shift

> ìsìphùkúphù:kù

This rule applies if the final tone is a suffixal high tone

[L ŋgi][H *fún+a][a] # [H ba][L gijim+a][H e] ## "I want them to run"

> L H L H L L H
> ŋgi + fun + a # ba + gijim + e Mapping Convention

> L H L L H L H
> ŋgi + fun + a # ba + gijim + e Ante-Penultimate Tone Shift

> ŋgìfúnà bà'gíjì:'mé

Root Tone Dissimilation feeds Ante-Penultimate Tone Shift, as the following example illustrates:

[L (m)ą] # [H ka][H *sebenz+a][H e] ## "Let him work"

> L H L H
> mą + ka + sebenz + a + e Root Tone Dissimilation

> L H L L H
> mą + ka + sebenz + e Mapping Convention etc.

> L L H L H
> mą + ka + sebenz + e Ante-Penultimate Tone Shift

> mɦąkàsébè:'nzé

The following example illustrates that a stem-final high tone as opposed to a suffixal high tone, blocks the application of this rule

[H iN][LLH jemane] ## "palm-wine"

> ínjèmà:'né
⊁ *ìnjémà:'né

In verbal constructions, Ante-Penultimate Tone Shift applies after the removal of internal word boundaries.

Example:

[H ú][H sa] # [L gijim+a][a] ## "He is still running"

> ú + sá # gìjim + a + a — SP Dissimilation

> ú + sá + gìjim + a — Mapping Convention etc.

> ú + sà + gíjì:m + à — Ante-Penultimate Tone Shift

> ùsàgíjì:mà

With copulative constructions, however, Ante-Penultimate Tone Shift applies before the removal of any internal word boundaries. In the following example, for instance, Ante-Penultimate Tone Shift does not apply because it cannot apply after the removal of the word boundary:

[H ú][L sa] #[L si][LLLL phukuphuku] ## "He is like a fool"

> ú + sà + sì + phùkùphùkù — Mapping Convention

> úsàsìphùkùphù:kù

⊁ *ùsàsìphùkúphù:kù

In the following examples Ante-Penultimate Tone Shift applies before the removal of the internal word boundary:

[H ú][L yɨ] #[H ɨ][L si][LLLL phukuphuku] ## "He is a fool"

> ú + yɨ # ɨ + sí + phukuphuku — Low Prefix Tone Rule

> ú + yɨ # ɨ + si + phukuphuku — Ante-Penultimate Tone Shift

> ú + y + ɨ + si + phukuphuku — Mapping Convention etc.

> úyʰɨsìphù'kúphù:kù — Penultimate Mora Creation etc.

$\begin{bmatrix}H\\ba\end{bmatrix}\begin{bmatrix}L\\se\end{bmatrix}$ # $\begin{bmatrix}H\\i\end{bmatrix}\begin{bmatrix}L\\si\end{bmatrix}\begin{bmatrix}LLL\\timela\end{bmatrix}\begin{bmatrix}\\eni\end{bmatrix}$ ## "They are in the train"

> $\overset{H}{ba} + \overset{L}{se}\ \#\overset{H}{i} + \overset{L}{si} + \overset{L\ L}{timel} + \overset{L\ L}{eni}$ Mapping Convention etc.

> $\overset{H}{ba} + \overset{L}{se}\ \#\overset{L}{i} + \overset{H}{si} + \overset{L\ L}{timel} + \overset{L\ L}{eni}$ Low Prefix Tone Shift

> $\overset{H}{ba} + \overset{L}{se}\ \#\overset{L}{i} + \overset{L}{si} + \overset{L\ H}{timel} + \overset{L\ L}{eni}$ Ante-Penultimate Tone Shift

> $\overset{H}{ba} + \overset{L}{se} + \overset{L}{si} + \overset{L\ H}{timel} + \overset{L\ L}{eni}$ Mapping Convention etc.

> básèsìtì'mélè:nì

Note that stem high tones are affected by the Ante-Penultimate Tone Shift Rule.

Example:

$\begin{bmatrix}H\\u\end{bmatrix}\begin{bmatrix}H\\ba\end{bmatrix}\begin{bmatrix}H\\jabul^{*}+a\end{bmatrix}\begin{bmatrix}\\is+a\end{bmatrix}\begin{bmatrix}\\ile\end{bmatrix}$ ## "He pleased them"

> $\overset{H}{u} + \overset{L}{ba} + \overset{H}{jabul} + a + is + a + ile$ OP Dissimilation

> $\overset{H}{u} + \overset{L}{ba} + \overset{L\ H}{jabul} + \overset{L}{is} + \overset{L\ L}{ile}$ Mapping Convention etc.

> $\overset{H}{u} + \overset{L}{ba} + \overset{L\ L}{jabul} + \overset{H}{is} + \overset{L\ L}{ile}$ Ante-Penultimate Tone Shift

> úbàjàbù'lísì:lè

Ante-Penultimate Tone Shift asserts the dominance of the low-toned trisyllabic stem over any preceding morpheme by shifting tonal prominence from that morpheme to the ante-penultimate syllable of the stem. This dominance of the low-toned trisyllabic stem over any preceding morpheme departs from the dominance hierarchy in that the latter applies to verbs only, while the former applies to verbs and non-verbs alike.

4.8 Lexical Tone Cluster Simplification

H⌢L	L	#
1	2	3
→ Ø	2	1

Condition: The cluster must not be associated with the penultimate syllable of a phrase final word.

Examples:

[H i][L ziN][HLL bhuzi] - [L zi][L a] #([H][L mi]) ## "my goats"

>	H L L H L L H L i + zim + bhuzi - zi + a + + mi	Lexical Tone Cluster Simplification
>	H L L H H L i + zim + bhuzi - z + a + mi	Mapping Convention etc.
>	ízìmbù'zí ' zá:mì	Penultimate Mora Creation etc.

[HL uma] #[H e][HL bon+a][a] #[H a][L ba][L ntu] ## "when he sees people"

>	H L L HL H L L uma #e + bon + a + a #a + ba + ntu	SP Dissimilation
>	H L L HL H L L uma #e + bon + a #a + ba + ntu	Mapping Convention
>	H L L HL L H L uma #e + bon + a #a + ba + ntu	Low Prefix Tone Shift
>	H L L L H L H L uma #e + bon + a # a + ba + ntu	Lexical Tone Cluster Simplification
>	H L L L L H L uma #e + bon + a #a + ba + ntu	vide Phrase Medial Final Tone Lowering 4.10
>	úmà èbònà à'bá:ntù	Penultimate Mora Creation etc.

If these lexical tone clusters were associated with the penultimate syllable of a phrase final word, they would surface because Penultimate Mora Creation would create the bi-moric sequences necessary for their realization.

[H i][L ziN][ĤL bhuzi] ## "sheep"

> H L ĤL L
> i + zim + bhuuzi — Penultimate Mora Creation

> ízì'mbû:zì — Long Vowel Realization etc.

[HL uma] #[H e][ĤL bon+a][a] ## "If he sees"

> H L L ĤL
> uma # e + bon + a + a — SP Dissimilation

> H L L ĤL L
> uma # e + bon + a — Mapping Convention etc

> H L L ĤL L
> uma # e + boon + a — Penultimate Mora Creation

> úmà è'bô:nà — Long Vowel Realization etc.

The function of rule 4.8 is to avoid homophony between morphemes containing HL and ĤL L tone sequences on the last two morae. If the lexical tone cluster were mapped in the usual manner according to the Mapping convention i.e. if ĤL ⟶ H, then all ĤL L sequences not occurring phrase finally would become homophonous with HL sequences in the same environment. With disyllabic verbs a very clear tonal class distinction is thus maintained between the two high classes.

	L class	H class	ĤL class
Phrase finally	LL	HL	ĤL L
Phrase medially	LL	HL	L H

With nouns it is both the tones of the stems and those of the noun prefixes that help to maintain the distinction; the stems are bracketted for clarity.

	Phrase finally	Phrase medially
Low-Low stems	L + H +(LL)	L + H +(LL)
Low-High stems	L + H +(LH)	L + H +(LH)
High-Low stems	H + L +(HL)	H + L +(HL)
Fall-Low stems	H + L +(ĤL L)	H + L +(LH)

4.9 Phrase Medial Tone Shift

$$\#\Big[\ H_n \begin{Bmatrix}H\\L\end{Bmatrix} \begin{Bmatrix}H\\L\end{Bmatrix}\ \Big]\#$$

Verb — Verb
Principal, present, positive
Subjunctive, past, positive

1	2	3
→ Ø	H	3

Conditions:

1. H_n is any string of tones containing one or more high tones.
2. The penultimate syllable, i.e. term 2, must be the only prominent syllable.

The rule states that in the present tense, positive of the principal sub-mood (i.e. indicative and conditional) and in the past tense, positive, of the subjunctive, all high tones to the left of the penultimate syllable are projected on that syllable, and simplify to H.

Examples:

$$\begin{bmatrix}H\\a\end{bmatrix}\begin{bmatrix}H\\ŋga\end{bmatrix} \# \begin{bmatrix}H\\zi\end{bmatrix}\begin{bmatrix}L\\dabul+a\end{bmatrix}\begin{bmatrix}\ \\a\end{bmatrix} \# \begin{bmatrix}L\\zo\end{bmatrix}\left(\begin{bmatrix}H\\\ \end{bmatrix}\begin{bmatrix}L\\ŋke\end{bmatrix}\right) \# \#$$

"He can tear them all"

$$> \overset{L}{a} + ŋg\overset{H}{a} \# \overset{H}{z}i + \overset{L}{d}abul + a + a \# \overset{L}{z}o + \overset{H}{\ } + ŋ\overset{L}{k}e$$

SP Dissimilation

$$> \overset{L}{a} + ŋg\overset{H}{a} + \overset{H}{z}i + \overset{L\ L}{d}abul + \overset{L}{a} \# \overset{H}{z}o\ ŋ\overset{L}{k}e$$

Mapping Convention etc.

$$> \overset{L}{a} + ŋg\overset{H}{a} + \overset{L}{z}i + \overset{H\ L}{d}abul + \overset{L}{a} \# \overset{H}{z}o + ŋ\overset{L}{k}e$$

Ante-Penultimate Tone Shift

$$> \overset{L}{a} + ŋg\overset{L}{a} + \overset{L}{z}i + \overset{L\ H}{d}abul + \overset{L}{a} \# \overset{H}{z}o\ ŋ\overset{L}{k}e$$

Phrase Medial Tone Shift

> àŋgàzìdàbúlà ' zó:ŋkè Penultimate Mora Creation etc.

$$\begin{bmatrix}H\\u\end{bmatrix}\begin{bmatrix}H\\sa\end{bmatrix} \# \begin{bmatrix}H\\the^{*}ŋg+a\end{bmatrix}\begin{bmatrix}\ \\is+a\end{bmatrix}\begin{bmatrix}\ \\a\end{bmatrix} \# \begin{bmatrix}H\\u\end{bmatrix}\begin{bmatrix}LH\\tshwala\end{bmatrix} \# \#$$

"He still sells beer"

> $\overset{L}{u} + \overset{H}{sa} \# \overset{H}{theŋg} + a + is + a \# \overset{H}{u} + tshw\overset{L\ H}{ala}$
>
> SP Dissimilation

> $\overset{L}{u} + \overset{H}{sa} + \overset{H}{theŋg} + \overset{L}{is} + \overset{L}{a} \# \overset{H}{u}\ tshw\overset{L\ H}{ala}$
>
> Mapping Convention etc.

> $\overset{L}{u} + \overset{H}{sa} + \overset{L}{theŋg} + \overset{H}{is} + \overset{L}{a} \# \overset{H}{u} + tshw\overset{L\ H}{ala}$
>
> Shift to Disyllabic Low

> $\overset{L}{u} + \overset{L}{sa} + \overset{L}{theŋg} + \overset{H}{is} + \overset{L}{a} \# \overset{H}{u} + tshw\overset{L\ H}{ala}$
>
> Phrase Medial Tone Shift

> ùsàthèŋgísà ' útshwà:'lá

A difference distinguishes a verb in phrase medial position from that in phrase final position in the indicative principal present positive. This difference is both morphological and tonological. The morphological difference is in the form of the prefix [$\overset{L}{ya}$], that marks the phrase final position, while tonologically, the penultimate syllable asserts positional prominence through the application of Phrase Medial Tone Shift. These two positions are illustrated in the following examples:

$\begin{bmatrix}H\\u\end{bmatrix}\begin{bmatrix}L\\ya\end{bmatrix}\begin{bmatrix}L\\hlabelel+a\end{bmatrix}\begin{bmatrix}\ \\a\end{bmatrix} \#\#$ "He is singing"

> $\overset{H}{u} + \overset{L}{ya} + \overset{L\ L\ L}{hlabelel} + \overset{L}{a}$ Mapping Convention etc.

> $\overset{L}{u} + \overset{H}{ya} + \overset{L\ L\ L}{hlabelel} + \overset{L}{a}$ Low Prefix Tone Shift

> $\overset{L}{u} + \overset{L}{ya} + \overset{L\ H\ L}{hlabelel} + \overset{L}{a}$ Ante-Penultimate Tone Shift

> ùyàhlàbélè:là Penultimate Mora Creation etc.

$\begin{bmatrix}H\\u\end{bmatrix}\begin{bmatrix}L\\hlabelel+a\end{bmatrix}\begin{bmatrix}\ \\a\end{bmatrix} \# \begin{bmatrix}L\\ka\end{bmatrix}\begin{bmatrix}H\\hle\end{bmatrix} \#\#$ "He sings well"

> $\overset{H}{u} + \overset{L\ L\ L}{hlabelel} + \overset{L}{a} \# \overset{L}{ka} + \overset{H}{hle}$ Mapping Convention etc.

> $\overset{L}{u} + \overset{L\ H\ L}{hlabelel} + \overset{L}{a} \# \overset{L}{ka} + \overset{H}{hle}$ Ante-Penultimate Tone Shift

> u + hlabelel + a # ka + hle Phrase Medial Tone Shift

> ùhlàbèlélà kà:'hlé

This tonological difference persists even in the absence of any morphological difference, as illustrated in the following examples:

[H u][H a] # [L gijim+a][a] ## "...and he ran" (past subjunctive)

> L H L
> u + a # gijim + a + a SP Dissimilation

> H L L L
> wa + gijim + a Mapping Convention etc.

> L H L L
> wa + gijim + a Ante-Penultimate Tone Shift

> wàgíjì:mà Penultimate Mora Creation etc.

[H u][H a] # [L gijim+a][a] # [L ka][HL̂L khulu] # # "...and he ran fast"

> L H L L L HL̂L
> u + a # gijim + a + a # ka + khulu SP Dissimilation

> H L L L L HL̂L
> wa + gijim + a # ka + khulu Mapping Convention etc.

> L H L L L HL̂L
> wa + gijim + a # ka + khulu Ante-Penultimate Tone Shift

> L L H L L HL̂L
> wa + gijim + a # ka + khulu Phrase Medial Tone Shift

> wàgìjímà kà'khû:lù

The fact that Phrase Medial Tone Shift applies also to the present conditional and the past subjunctive, suggests that the complements to conditional [ngȁ^{H}] and the so-called past subjunctive [^{H}à] may be in the present principal.

Functionally, Phrase Medial Tone Shift asserts the

penultimate syllable as the prominent syllable within the word by regulating tonal prominence in its favour.

4.10 Phrase Medial Final Tone Lowering

H ⟶ L / ... (C) V C $\bar{V}$ #

Condition:
The penultimate syllable must have [+ prominence].

The rule states that the high tone associated with the final syllable in a phrase medial word is converted to a low tone if the penultimate syllable contains the feature [+ prominence].

As we stated in 0.3.1, penultimate syllable prominence resides in the penultimate syllable of a word if no other syllable has [+ stress], and if the final syllable contains only one mora.

So, if all the syllables within a word have [- stress], and if the penultimate and final syllables of the word are both one-mora, then any high tone associated with the final syllable is converted into a low tone.

Example:

$$\begin{bmatrix} H \\ i \end{bmatrix}\begin{bmatrix} L \\ ziN \end{bmatrix}\begin{bmatrix} H \\ ja \end{bmatrix} \# \begin{bmatrix} H \\ zi \end{bmatrix}\begin{bmatrix} H \\ th\overset{*}{a}nd+a \end{bmatrix}\begin{bmatrix} \\ a \end{bmatrix} \# \begin{bmatrix} H \\ a \end{bmatrix}\begin{bmatrix} L \\ ma \end{bmatrix}\begin{bmatrix} \widehat{HLL} \\ thambo \end{bmatrix} \# \#$$

"Dogs love bones"

$$> \overset{H}{i} + \overset{L}{ziN} + \overset{H}{ja} \# \overset{L}{zi} + \overset{H}{thand} + a + a \# \overset{H}{a} + \overset{L}{ma} + \overset{\widehat{HL}}{thambo}\ \overset{L}{}$$

SP Dissimilation

$$> \overset{H}{i} + \overset{L}{ziN} + \overset{H}{ja} \# \overset{L}{zi} + \overset{H}{thand} + \overset{L}{a} \# \overset{H}{a} + \overset{L}{ma} + \overset{\widehat{HL}}{thambo}\ \overset{L}{}$$

Mapping Convention etc.

$$> \overset{H}{i} + \overset{L}{ziN} + \overset{L}{ja} \# \overset{L}{zi}\ \overset{H}{thand} + \overset{L}{a} \# \overset{H}{a} + \overset{L}{ma} + \overset{\widehat{HL}}{thambo}\ \overset{L}{}$$

Phrase Medial Tone Lowering

> ízìnjà zì'thándà ' ámà'thâ:mbò Penultimate Mora Creation etc.

If the final syllable is bi-moric, however, then penultimate syllable prominence does not reside in the penultimate syllable, and consequently, the high tone in the final syllable does not get converted into a low tone.

Example:

[H u][L gez+a][HL ee] # [L ka][H hle] ## "He washed well"

> H L HL L H
> u + gez + ee # ka + hle Mapping Convention etc.

> úgè'zêê kà:'hlé

If one syllable within the word has [+ stress], then Phrase Medial Final Tone Lowering does not apply.

Example:

[L nạ]([H][H lo]) # [L m][HL fana] ## "and this boy"

> H H L H L Mapping Convention etc.
> nạ + lo # m + fana

> L HH L H L vide Tonal Displacement, 4.11
> nạ + lo # m + fana

> L H L H L Mapping Convention
> nạ + lo # m + fana

> nⁿ̀ạ̀lóó m̀'fá:nà

Notice that a high tone in the final syllable does not create any imbalance in prominence and consequently does not get lowered if the penultimate syllable i.e. the prominent syllable is bi-moric.

Example:

[L ụ][H thand*+a][a] # [H i][L ziN][H ja] ## "You love dogs"

> L H L H L H Mapping Convention etc.
> ụ + thand + a # i + ziN + ja

> ụthándà ' ízì:'njá

The function of Phrase Medial Final Tone Lowering is to adjust tonal prominence in terms of penultimate syllable prominence. If a prominent penultimate syllable and the final syllable are both one-mora syllables, then any imbalance in prominence caused by the occurrence of tonal prominence in the non-prominent final syllable is adjusted by having such prominence removed by this rule. If, however, the prominent syllable is bi-moric, then no imbalance in prominence is caused by having tonal prominence in the final syllable, and, consequently, no adjustment of tonal prominence is required.

Finally, note that if the final high tone is word medial, i.e. part of a compound word, then no imbalance is created between the H and the syllable to its left, because no penultimate syllable prominence resides in the penultimate syllable of an inner element of a word.

Example:

$$\begin{bmatrix} H \\ i \end{bmatrix}\begin{bmatrix} L \\ ziN \end{bmatrix}\begin{bmatrix} \\ ja \end{bmatrix} - \begin{bmatrix} L \\ zi \end{bmatrix}\begin{bmatrix} L \\ a \end{bmatrix} \# \left(\begin{bmatrix} H \\ \end{bmatrix}\begin{bmatrix} L \\ mi \end{bmatrix}\right) \#\# \text{ "My dogs"}$$

$$> \overset{H}{i} + \overset{L}{ziN} + \overset{H}{ja} - \overset{H}{za} + \overset{L}{mi} \qquad \text{Mapping Convention}$$

> ízì'njá ' zá:mì

4.11 Tonal Displacement

$$\# \ldots \underset{1}{H}\ \underset{2}{T} \ldots \#$$
$$\longrightarrow \emptyset\ H$$

T = any tone

Conditions:
1. Term 1 must be associated with a syllable containing the features $\begin{bmatrix} + \text{ slack} \\ - \text{ stress} \\ - \text{ prominence} \end{bmatrix}$.
2. Term 2 must be associated with a syllable containing the feature [- slack].

The rule states that within a word, a high tone associated with a [+ slack / − stress], one-mora syllable, shifts to the mora to its immediate right, if the latter is in a [- slack] syllable.

Tonal Displacement is ordered to apply after Tone Epenthesis.

Examples:

[H i][L zi][LL balo] # # "sums"

>	L H L L i + zi + balo	Low Prefix Tone Shift
>	L H L L i + zi + baalo	Penultimate Mora Creation
>	L H LL L i + zi + baalo	Tone Epenthesis
>	L L HL L L i + zi + ba alo	Tonal Displacement
>	L L HL L i + zi + baalo	Mapping Convention
>	ìzìbâ:lò	Long Vowel Realization etc.

cf. ìsíbà·lò "sum"

The following example illustrates that Tonal Displacement does not take place to another [+ slack] syllable.

[H i][L ziN][LL dle...] # # "paths"

>	L H L L i + ziN + dlela	Low Prefix Tone Shift
>	L H L L i + ziN + dleela	Penultimate Mora Creation
>	L H LL L i + ziN + dleela	Tone Epenthesis
>	ìzíndlè:là	Long Vowel Realization etc.

Cope (1966:59) states that in the Natal Coast dialect Tonal Displacement onto demonstratives is not permitted. The fact of the matter is that Tonal Displacement

cannot apply to demonstratives in the Natal Coast dialect because the initial syllables of such constructions are [+ slack]. Compare these two examples:

$\begin{bmatrix} L \\ nạ \end{bmatrix}$ # $\left(\begin{bmatrix} H \end{bmatrix}\begin{bmatrix} H \\ lạ \end{bmatrix}\begin{bmatrix} \\ ba \end{bmatrix}\right)\begin{bmatrix} \\ o \end{bmatrix}$ ## "and those" (Natal Coast dialect)

> $\overset{H}{nạ} + \overset{H}{la} + b + \overset{L}{o}$ Mapping Convention etc.

> $n^{\mathrm{h}}ạ́'l^{\mathrm{h}}ạ́:bò$ Penultimate Mora Creation etc.

$\begin{bmatrix} L \\ nạ \end{bmatrix}$ # $\left(\begin{bmatrix} H \end{bmatrix}\begin{bmatrix} H \\ la \end{bmatrix}\begin{bmatrix} L \\ ba \end{bmatrix}\right)\begin{bmatrix} \\ o \end{bmatrix}$ ## "and those" (KwaZulu dialect)

> $\overset{H}{na} + \overset{H}{la} + b + \overset{L}{o}$ Mapping Convention etc.

> $\overset{H}{nạ} + \overset{H}{laa} + b + \overset{L}{o}$ Penultimate Mora Creation

> $\overset{L}{nạ} + \overset{HHH}{la\ a} + b + \overset{L}{o}$ Tone Epenthesis

> $\overset{L}{nạ} + \overset{HH}{laa} + b + \overset{L}{o}$ Mapping Convention

> $n^{\mathrm{h}}ạ̀lá:bò$ Long Vowel Realization etc.

Tonal Displacement does not take place from a syllable of penultimate syllable prominence as this would create an imbalance in prominence by shifting tonal prominence from a prominent penultimate syllable to a non-prominent final syllable. In the following example, Tonal Displacement does not apply to the penultimate syllable of the first word because the syllable has penultimate syllable prominence while the final syllable is non-prominent, and both are one-mora syllables.

$\begin{bmatrix} H \\ iN \end{bmatrix}\begin{bmatrix} HL \\ gane \end{bmatrix}$ # $\begin{bmatrix} H \\ i \end{bmatrix}\begin{bmatrix} L \\ zo \end{bmatrix}$ # $\begin{bmatrix} L \\ z+a \end{bmatrix}$ ## "The child will come"

> $\overset{H}{iN} + \overset{H\ L}{gane}\ \#\overset{H}{i} + \overset{L}{zo} + z + \overset{L}{a}$ Mapping Convention etc.

> í'ŋgánè ' ízò:zà Penultimate Mora Creation etc.

In 4.10 it was pointed out that a high tone in the final syllable does not create an imbalance in prominence if the penultimate syllable i.e. the prominent syllable, is bi-moric. In the following example, therefore, it is the bi-moric syllable that blocks the high tone from being displaced from the penultimate syllable onto the final syllable.

[H iN][HL gane] ## "child"

>	H H L iN + gaane	Penultimate Mora Creation
>	H HH L iN + gaane	Tone Epenthesis
>	í'ŋgá:nè	Long Vowel Realization etc.

Tonal Displacement takes place from the penultimate syllable of a word, if such tone shift does not create any imbalance in prominence i.e. if the penultimate syllable is non-prominent.

Examples:

[HL njeŋga] # ([H][H lo]) ## "like this one"

>	H H H njeŋga + lo	Mapping Convention
>	H L HH njeŋga + lo	Tonal Displacement
>	H L H njeŋga + lo	Mapping Convention
>	njéŋgà ' ló	

[L ŋga] # [H u][HL foo] ## "at four o'clock"

>	H HL ŋgo + foo	Mapping Convention etc.
>	L HHL ŋgo + foo	Tonal Displacement
>	L HL ŋgo + foo	Mapping Convention
>	ŋgòfɔ̂:	Long Vowel Realization etc.

Tonal Displacement does not apply to a high tone associated with a stressed syllable. In the following example Tonal Displacement is blocked from applying to the first syllable of the second word by the feature [+ stress].

[H u][L ku][L th+i] # [HLLL gilikidi] # # "To fall down"

> L H L H L L L
> u + ku + th + i # gilikidi Low Prefix Tone Shift

> ùkúthì ' gílìkìdì

Tonal displacement does not take place from a bi-moric syllable.

Example:

[L nạ] # [H i][L li][LL saka] # # "and a sack"

> L L H L L
> nạ # i + li + saka Low Prefix Tone Rule

> L LH L L
> nạ # ii + saka Consonant Deletion

> LLH L L
> n + ẹẹ + saka Mapping Convention etc.

> LH L L
> nẹẹ + saka Mapping Convention

> HH L L
> nẹẹ + saka Low Tone Conversion

> $n^{ɦ}$ẹ́:sà:kà Penultimate Mora Creation etc.

It is worth noting that the low level rule, Vowel Shortening, applies after Tonal Displacement. In the example above, for instance, it may optionally apply, resulting in /$n^{ɦ}$ẹ́sà:kà/. However, it may not apply before Tonal Displacement because then it would lead to the following wrong results */$n^{ɦ}$ẹ̀sâ:kà/.

The function of Tonal Displacement is to resolve the incompatibility of a high tone and a [+ slack] mora by blocking their co-articulation. If the high tone

cannot be shifted away from a [+ slack] mora, then, as we saw in 2.2.2 it is realized as an upgliding-high tone.

Schuh (1978) contends that Tonal Displacement, explained by Cope (1970) is not a sufficiently explanatory account of the tonal alternations conditioned by consonantal types in Zulu. He quotes the following examples of Tonal Displacement supplied by Cope:

ìzíhlàlò	→	ìzìhlálò or ìzìhlâlò	"chairs"
nhényònì	→	nhènyónì or nhènyônì	"with a bird"

He then suggests a Hi Spreading Rule and a Depressor Lowering Rule to account for tonal alternations in the examples above, and in all other cases of Tonal Displacement. The problem with this solution is that the evidence at our disposal indicates that the tonal rules of Zulu regulate tonal prominence in one of two ways: either they shift a high tone from one mora to another or they delete it. The Hi Spreading Rule, on the other hand, suggests that some tonal rules in Zulu create tonal prominence. Schuh is lead to this conclusion by the incorrect data supplied by Cope on 'tonal assimilation'. Cope supplies these two examples, the first of which is meant to illustrate 'tonal assimilation":

àbáyìbónì	→	àbáyí'bónì	"they do not see it"
àbázìbónì	→	àbázìbónì	"they do not see them"

Tonal assimilation in Cope's data is what Schuh describes as Hi Spreading, i.e. the extension of the domain of a high tone. Our interpretation of the first of Cope's examples above differs radically from his. To us this example illustrates 'low tone raising', and in the second example low tone raising is blocked

by the feature [+ slack]. This is how we would represent the surface representations of these examples:

ąbąyibo:ni ## "they do not see it"

ąbązibo:ni ## "they do not see them"

In other words, the phonological tones occurring in both are the same:

ąbáyì'bónì

ąbázì'bónì

Let us conclude this section by supplying two derivations which illustrate the results of Tonal Displacement in phrase medial and phrase final positions.

$\begin{bmatrix} L \\ nę \end{bmatrix} \# \begin{bmatrix} H \\ iN \end{bmatrix}\begin{bmatrix} LL \\ ɲoni \end{bmatrix} - \begin{bmatrix} L \\ i \end{bmatrix}\begin{bmatrix} L \\ a \end{bmatrix}\left(\begin{bmatrix} H \\ \end{bmatrix}\begin{bmatrix} L \\ mi \end{bmatrix}\right) \# \#$ "and my bird"

	H L L H L nę + ɲoni - ya + mi	Mapping Convention etc.
>	H L L H L nę + ɲoni - yaa + mi	Penultimate Mora Creation
>	H L L HH L nę + ɲoni - yaa + mi	Tone Epenthesis
>	L HL L HH L nę + ɲoni - yaa + mi	Tonal Displacement
>	L H L HH L nę + ɲoni - yaa + mi	Mapping Convention
>	n^{h}è:ɲóni ' yá:mì	Long Vowel Realization etc.

$\begin{bmatrix} L \\ nę \end{bmatrix} \# \begin{bmatrix} H \\ iN \end{bmatrix}\begin{bmatrix} LL \\ ɲoni \end{bmatrix} \# \#$ "and a bird"

	H L L nę + ɲoni	Mapping Convention etc.
>	H L L nę + ɲooni	Penultimate Mora Creation
>	H LL L nę + ɲooni	Tone Epenthesis
>	L HLL L nę + ɲo oni	Tone Displacement

> $\overset{L}{n\varepsilon} + \overset{HL\ L}{nooni}$ Mapping Convention

> $n^{\eta}\grave{\varepsilon}nô{:}ni$ Long Vowel Realization, etc.

4.12 Conclusion

This Chapter has discussed the eleven tonological rules of Zulu. In concluding this section and the whole study, it is worth emphasizing three points of major importance that have emerged. The first is that in our formulation many tonal rules require segmental information. This would not be worth mentioning were it not for the fact that we have adopted an autosegmental approach to the representation of tone and this interaction between tiers suggests that the tones and segments have become associated with one another. We have not explored the important question of the ordering of tone association (mapping) relative to the application of tonal rules and have simply allowed association to take place randomly. This is clearly unsatisfactory and the whole question requires further careful study. We have taken the view that this would go well beyond the scope of this essentially descriptive study that is only informally based on some assumptions of Autosegmental Phonology.

The second point is that the application of the tonal rules is frequently conditioned by grammatical facts. At this stage we can do no better than record the particular details for each case. It is possible, however, that future studies may detect deeper regularities which could lead to a more general statement of sub-regularities.

The third point is that a number of functional criteria interact in Zulu derivations to preserve categorical information and regulate the distribution of prominence in surface structures. These criteria may be satisfied by the application of a rule in some cases or indeed

by a rule being blocked in others. It is not surprising therefore that many rules are subject to complex conditions making it difficult to provide simple formulations. Some of these conditions appear to be global rules in the familiar sense of that term, and, it is clear that the description of Zulu tone cannot dispense with this powerful extension to phonological theory. We have not explored the question of alternative analyses that may be able to dispense with global conditions on tonal derivations but, according to our present understanding, the facts of Zulu demand them. This cannot be a surprising conclusion given the functional basis of many rules and the well-known difficulty of stating such rules in phonological theories.

APPENDIX A

Here are the underlying representations of some of the roots that are in common usage in Zulu.

NOUNS

1. Low

[H a][L ba][L ntu] "people"

[H iN][L dlu] "house"

[H i][L li][L zwe] "country"

[H u][L mu][L nwe] "finger"

[H a][L ma][L ŋga] "lies"

[H a][L ma][L ndla] "strength"

[H u][L mu][L zi] "village, homestead"

[H i][L si][L tsha] "dish, vessel"

[H a][L ma][L fu] "clouds"

[H i][L si][L ŋkwa] "bread"

2. High

[H iN][H ja] "dog"

[H i][L li][H zwi] "voice, word"

[H iN][H tho] "thing"

[H iN][H vu] "sheep"

[H ú][L mu][H thi] "tree, medicine"

[H í][L si][H tha] "enemy"

[H iN][H phi] "battle, war, army"

[H í][L si][H tho] "limb"

[H ú][L mu][H sa] "kindness"

[H ú][L bu][H so] "face"

3. Low-Low

[H iN][LL doda] "man"

[H í][L si][LL hlalo] "chair"

[H iN][LL daba] "story, affair"

[H ú][L m][LL fula] "river"

[H á][L ma][LL phepha] "papers, documents"

[H ú][L m][LL ŋgane] "friend"

[H ú][L m][LL luŋgu] "white person"

[H í][L si][LL Zulu] "the Zulu language"

[H í][L li][LL khofi] "coffee"

[H iN][LL ɲama] "meat"

4. Low-High

[H iN][LH cwadi] "book, letter"

[H u][LH baba] "father"

[H iN][LH khomo] "beast"

[H i][L si][LH khathi] "time"

[H iN][LH thombi] "girl"

[H i][L li][LH gazi] "blood"

[H i][L li][LH bhodwe] "pot"

[H iN][LH mali] "money"

[H u][LH thisha] "teacher"

[H iN][LH bhobo] "hole"

5. Fall-Low

[H i][L li][HLL khaya] "home"

[H u][L bu][HLL hlungu] "pain, sorrow"

[H iN][HLL vula] "rain"

[H i][L si][HLL khwama] "bag"

[H u][L lu][HLL bisi] "milk"

[H i][L li][HLL khanda] "head"

[H i][L ziN][HLL khuni] "firewood"

[H a][L ma][HLL khaza] "cold"

[H iN][HLL dawo] "place"

[u][lu][limi]	"tongue, language"

6. High-Low

[iN][mǫto]	"car"
[i][li][kati]	"cat"
[iN][gane]	"child, baby"
[a][ba][fana]	"boys"
[i][li][jazi]	"coat"
[iN][sizwa]	"young man"
[i][li][senti]	"cent"
[i][li][tiye]	"tea"
[i][li][bhasi]	"bus"
[i][si][tofu]	"stove"

7. Low-Low-Low

[a][ma][zambane]	"potatoes"
[i][li][thikithi]	"ticket"
[i][li][phalishi]	"porridge"
[i][si][timela]	"train"
[i][li][bhodlela]	"bottle"

8. High-Low-High

[H iN][HLH khonjane]	"swallow"
[H i][L li][HLH phoyisa]	"policeman"
[H iN][HLH qhudulu]	"hornless beast"
[H iN][HLH khedama]	"orphan"
[H i][L li][HLH bululu]	"puff adder"

9. Low-High-Low

[H iN][LHL hliziyo]	"heart"
[H i][L si][LHL gebeŋgu]	"criminal"
[H u][L m][LHL godoyi]	"mongrel"
[H i][L li][LHL goboŋgo]	"a wide-mouthed calabash"
[H i][L si][LHL fociya]	"fibre belt worn by women"

10. Low-Low-High

[H iN][LLH jemane]	"palm wine"
[H iN][LLH gulule]	"cheetah"
[H iN][LLH bhabala]	"bush-buck"
[H iN][LLH jomane]	"horse"
[H iN][LLH dikimba]	"subject"

11. Low-Fall-Low

[H u][LHL malume]	"maternal uncle"
[H u][L mu][LHL phongolo]	"barrel"
[H iN][LHL thondolo]	"wether"
[H iN][LHL khonane]	"calf"
[H i][L si][LHL hlabathi]	"sand"

RELATIVES

1. High

[H ze]	"empty, naked"
[H nco]	"speckled red and white"

2. Low-Low

[LL qotho]	"honest"
[LL nzima]	"heavy"
[LL banzi]	"wide"
[LL nsundu]	"brown"

3. High-Low

[HL ngcono]	"better"
[HL thile]	"certain"
[HL duma]	"tasteless"

4. Low-High

LH [bomvu]	"red"
LH [njani]	"how"

5. Fall-Low

HLL [lula]	"light"

VERBS

1. Low

L [hlw+a]	"become dark"	L [sh+o]	"say so, mean"
L [b+a]	"be, become"	L [ny+a]	"excrete"
L [lw+a]	"fight"	L [w+a]	"fall"
L [n+a]	"rain"	L [y+a]	"go (to)"
L [mb+a]	"dig"	L [z+a]	"come (to)"
L [th+i]	"say"	L [s+a]	"take (to)"

2. High

H [dl+a*]	"eat"	H [f+a*]	"die"
H [kh+a*]	"draw, pick"	H [ph+a*]	"give"
H [s+a*]	"dawn"	H [sh+a*]	"burn"
H [m+a*]	"stand, stop"	H [zw+a*]	"hear, feel"

3. High-Low (VC+V)

[H*L akh+a]	"build"	[H*L om+a]	"become dry, thirsty"
[H*L al+a]	"refuse"	[H*L on+a]	"spoil, sin"
[H*L aŋg+a]	"kiss"	[H*L oth+a]	"warm oneself by a fire"
[H*L az+a]	"know"	[H*L ond+a]	"become thin"
[H*L eb+a]	"steal"	[H*L ey+a]	"despise"

4. Low (VC+V)

[L ab+a]	"apportion"	[L eq+a]	"jump"
[L and+a]	"increase"	[L oph+a]	"bleed"
[L ehl+a]	"alight"	[L ondl+a]	"nourish"
[L end+a]	"get married"	[L oŋg+a]	"save"
[L enz+a]	"make"	[L os+a]	"roast, grill"

5. High-Low (CVC+V)

[H*L bhal+a]	"write"	[H*L fun+a]	"want"
[H*L bon+a]	"see"	[H*L qal]	"begin"
[H*L dlal+a]	"play"	[H*L sind+a]	"be heavy"
[H*L khal+a]	"cry"	[H*L thand+a]	"like"

6. High (CVC+V)

[H* buz+a]	"ask"	[H* phuz+a]	"drink"

[H* fund+a]	"read"	[H* ŋgen+a]	"enter"
[H* hamb+a]*	"go"	[H* sind+a]	"escape, recover"
[H* lal+a]	"sleep"	[H* vuk+a]	"get up"

7. Low (CVC+V)

[L bamb+a]	"catch, hold"	[L hlek+a]	"laugh"
[L bhem+a]	"smoke"	[L phek+a]	"cook"
[L gez+a]	"wash"	[L sind+a]	"apply cow-dung on the floor"
[L hlal+a]	"sit, live"	[L val+a]	"close"

8. High (VCVC+V)

[H* ehlul+a]	"overcome"	[H* enway+a]	"scratch"
[H* encik+a]	"lean against"	[H* enuk+a]	"ascend]
[H* enek+a]	"spread out"	[H* esab+a]	"fear"

9. Low (VCVC+V)

[L elaph+a]	"cure"	[L emboz+a]	"cover"
[L eluk+a]	"plait, knit"	[L ethuk+a]	"get a fright"
[L embath+a]	"wear"	[L ozel+a]	"be drowzy"

10. High (CVCVC+V)

[H* sebenz+a]	"work"	[H* jabul+a]	"be happy"
[H* khulum+a]	"speak"	[H* khathal+a]	"become tired"

[H* fund+a]	"read"	[H* ŋgen+a]	"enter"
[H* hamb+a]*	"go"	[H* sind+a]	"escape, recover"
[H* lal+a]	"sleep"	[H* vuk+a]	"get up"

7. Low (CVC+V)

[L bamb+a]	"catch, hold"	[L hlek+a]	"laugh"
[L bhem+a]	"smoke"	[L phek+a]	"cook"
[L gez+a]	"wash"	[L sind+a]	"apply cow-dung on the floor"
[L hlal+a]	"sit, live"	[L val+a]	"close"

8. High (VCVC+V)

[H* ehlul+a]	"overcome"	[H* enway+a]	"scratch"
[H* encik+a]	"lean against"	[H* enuk+a]	"ascend]
[H* enek+a]	"spread out"	[H* esab+a]	"fear"

9. Low (VCVC+V)

[L elaph+a]	"cure"	[L emboz+a]	"cover"
[L eluk+a]	"plait, knit"	[L ethuk+a]	"get a fright"
[L embath+a]	"wear"	[L ozel+a]	"be drowzy"

10. High (CVCVC+V)

[H* sebenz+a]	"work"	[H* jabul+a]	"be happy"
[H* khulum+a]	"speak"	[H* khathal+a]	"become tired"

[H bul*ál+a] "kill"

[H dub*úl+a] "shoot"

11. Low (CVCVC+V)

[L gijim+a] "run"

[L dabul+a] "tear"

[L cabaŋg+a] "think"

[L vilaph+a] "be lazy"

[L ŋgabaz+a] "doubt"

[L goduk+a] "go home"

APPENDIX B

The following schema for Zulu tenses constitutes a modified version of that set up by P D Beuchat and D F Gowlett for lecture notes in the Department of African Languages, University of the Witwatersrand, Johannesburg. (The verbal radical $[\overset{H}{d}l\overset{*}{a}]$ means "eat".)

Abbreviations

Pr.	=	Present
Pa.	=	Past
Re.	=	Remote
Fu.	=	Future
St.	=	Stative
R	=	Verbal Radical
SP^p	=	Subject prefix, participial sub-mood
SP^s	=	Subject prefix, subjunctive
SP^c	=	Subject prefix, conditional

TENSES OF THE VERB

1. The Indicative Mood

A. The Principal Sub-Mood

	Positive	Negative
a. Present		
1. Present:	SP-R-a / SP-ya-R-a	ą+SP-R-a
e.g.	údlà úyà:dlá	ąkâ:dlí
2. Pa. Pr.:	SP-be+SP^p-R-a	SP-be+SP^p-nga-R-i
e.g.	ùbê:dlà	ùbéŋgà:dlí
3. Re.Pa.Pr.:	SP-a:-be+SP^p-R-a	SP-a:+be+SP^p-ŋga-R-i
e.g.	wâ:yê:dlà	wâyéŋgà:dlí

b. Future

1. Future:	SP-zo-(ku)-R-a	ą+SP-zu-(ku)-R-a
e.g.	úzò:dlá	ąkázùkû:dlá
2. Pa.Fu.:	SP-be+SP^{p}-zo-(ku)-R-a	SP-be+SP^{p}-ŋga-zu-(ku)-R-a
e.g.	ùbézòkù:dlá	ùbéŋgèzùkû:dlá
3. Re.Pa.Fu.:	SP-a:-be+SP^{p}-zo-(ku)-R-a	SP-a:-be+SP^{p}-ŋga-zu-(ku)-R-a
e.g.	wâ:yézòkù:dlá	wâ:yéŋgèzùkû:dlá

c. Stative

1. Stative:	SP-R-e: / SP-R-ile	ą+SP-R-ile
e.g.	ùdlê : údlí:le	ąkàdlî:lé
2. Pa.St.:	SP-be+SP^{p}-R-ile	SP-be+SP^{p}-ŋga-R-ile
e.g.	ùbèdlî:lè	ùbéŋgàdlî:lé
3. Re.Pa.St.:	SP-a:-be+SP^{p}-R-ile	SP-a:-be+SP^{p}-ŋga-R-ile
e.g.	wâ:yèdlî:lè	wâ:yéŋgàdlî:lé

d. Past

1. Past:	SP-R-e: / SP-R-ile	ą-SP-R-aŋga
e.g.	ùdlê: údlí:le	ąkàdlá:ŋga
2. Pa.Pa.:	SP-be+SP^{p}-R-ile	SP-be+SP^{p}-ŋga-R-aŋga
e.g.	ùbèdlî:lè	ùbéŋgàdlá:ŋgà
3. Re.Pa.Pa.:	SP-a:-be+SP^{p}-R-ile	SP-a:-be+SP^{p}-ŋga-R-aŋga
e.g.	wâ:yèdlî:lè	wâ:yéŋgàdlá:ŋgà

e. Remote Past

1. Re.Pa.:	SP-a:-R-a	
e.g.	wâ:dlá	

B. The Participial Sub-Mood

	Present	Negative
a. Present		
1. Present:	SP^{p}-R-a	SP^{p}-ŋga-R-i
e.g.	ê:dlà	éŋgà:dlí

2. Pa.Pr.:	SP^p-be+SP^p-R-a	SP^p-be+SP^p-ŋga-R-i
e.g.	èbê:dlà	èbéŋgà:dlí
3. Re.Pa.Pr.:	SP^p-a:-be+SP^p-R-a	SP^p-a:-be+SP^p-ŋga-R-i
e.g.	à:yêdlà	à:yéŋgà:dlí

b. Future

1. Future:	SP^p-zo-(ku)-R-a	SP^p-ŋga-zu-(ku)-R-a
e.g.	ézò:dlá	éngèzùkû:dlá
2. Pa.Fu.:	SP^p-be+SP^p-zo-(ku)-R-a	SP^p-be+SP^p-ŋga-zu-(ku)-R-a
e.g.	èbézò:dlá	èbéŋgèzùkû:dlá
3. Re.Pa.Fu.:	SP^p-a:-be+SP^p-zo-(ku)-R-a	SP^p-a:-be+SP^p-ŋga-zu-(ku)-R-a
e.g.	à:yézòkù:dlá	à:yéŋgèzùkû:dlá

c. Stative

1. Stative:	SP^p-R-e:/SP^p-R-ile	SP^p-ŋga-R-ile
e.g.	èdlê: /èdlî:le	éŋgàdlî:lé
2. Pa.St.:	SP^p-be+SP^p-R-ile	SP^p-be+SP^p-ŋga-R-ile
e.g.	èbèdlî:lè	èbéŋgàdlî:lé
3. Re.Pa.St.:	SP^p-a:-be+SP^p-R-ile	SP^p-R-a:-be+SP^p-ŋga-R-ile
e.g.	à:yèdlî:lè	à:yéŋgàdlî:lé

d. Past

1. Past:	SP^p-R-e:/SP^p-R-ile	SP^p-ŋga-R-aŋga
e.g.	èdlê: /èdlî:lè	éŋgàdlá:ŋgà
2. Pa.Pa.:	SP^p-be+SP^p-R-ile	SP^p-be+SP^p-ŋga-R-aŋga
e.g.	èbèdlî:lè	èbéŋgàdlá:ŋgà
3. Re.Pa.Pa.:	SP^p-a:-be+SP^p-R-ile	SP^p-a:-be+SP^p-ŋga-R-aŋga
e.g.	à:yèdlî:lè	à:yéŋgàdlá:ŋgà

e. Remote Past

1. Re.Pa.:	SP^p-a:-R-a
e.g.	à:dlá

2. The Conditional Mood

A. The Principal Sub-Mood

	Positive	Negative
Present		
1. Present:	SP^{C}-ŋga-R-a	SPc-ŋge:-R-e
e.g.	àŋgâ:dlá	àŋgê:dlé
2. Pa.Pr.:	SP-be+SP^{p}-ŋga-R-a	SP-be+SP^{p}-ŋge:-R-e
e.g.	ùbéŋgâ:dlá	ùbéŋgê:dlé
3. Re.Pa.Pr.:	SP-a:-be+SP^{p}-ŋga-R-a	SP-a:-be+SP^{p}-ŋge:-R-e
e.g.	wâ:yéŋgâ:dlá	wâ:yéŋgê:dlé

B. The Participial Sub-Mood

	Positive	Negative
Present		
1. Present:	SP^{p}-ŋga-R-a	SP^{p}-ŋge:-R-e
e.g.	èŋgâ:dlá	éŋgê:dlé
2. Pa.Pr.:	SP^{p}-be+SP^{p}-ŋga-R-a	SP^{p}-be+SP^{p}-ŋge:-R-e
e.g.	èbéŋgâ:dlá	èbéŋgê:dlé
3. Re.Pa.Pr.:	SP^{p}-a-:be+SP^{p}-ŋga-R-a	SP^{p}-a:-be+SP^{p}-ŋge:-R-e
e.g.	à:yéŋgâ:dlá	à:yéŋgê:dlé

3. Subjunctive Mood

1. Present:	SP^{S}-R-e	SP^{S}-ŋga-R-i
e.g.	á:dlè	áŋgà:dlí
2. Exhortative:	SP^{S}-bo:-(ku)-R-a	SP^{S}-ŋga-bo:-(ku)-R-a
e.g.	àbô:kù:dlá	áŋgàbô:kù:dlá
3. Past (Narrative):	SP-a-R-a	ą-SP-ŋga:-R-a
e.g.	wâ:dlá	ąkáŋgâ:dlá
		ąkâ:dlá

TENSES OF THE COPULATIVE

1. The Indicative Mood

A. The Principal Sub-Mood

	Present	Negative
a. Present		
1. Present:	SP-ba+Stem	ą-SP-bi+Stem
e.g.	úbà qò:thò	ąkábí qò:thó
2. Pa.Pr.:	SP-be+SP^{p}-ba+Stem	SP-be+SP^{p}-ŋga-bi+Stem
e.g.	ùbébà qò:thò	ùbéŋgàbí qò:thò
3. Re.Pa.Pr.:	SP-a:-be+SP^{p}-ba+Stem	SP-a:-be+SP^{p}-ŋga-bi+Stem
e.g.	wâ:yébà qò:thò	wâ:yéŋgàbí qò:thò
b. Future		
1. Future:	SP-zo-(ku)-ba+Stem	ą-SP-zu-(ku)-ba+Stem
e.g.	úzòbà qò:thò	ąkázùkúbà qò:thò
2. Pa.Fu.:	SP-be+SP^{p}-zo-(ku)-ba+Stem	SP-be+SP^{p}-ŋga-zu-(ku)-ba+Stem
e.g.	ùbézòbà qò:thò	ùbéŋgèzùkúbà qò:thò
3. Re.Pa.Fu.:	SP-a:-be+SP^{p}-zo-(ku)-ba+Stem	SP-a:-be+SP^{p}-ŋga-zu-(ku)-ba+Stem
e.g.	wâ:yézòbà qò:thò	wâ:yéŋgèzùkúbà qò:thò
c. Stative		
1. Stative:	SP-Stem	ą-SP-Stem
e.g.	úqò:thò	ąkàqò:thó
2. Pa.St.:	SP-be+SP^{p}-Stem	SP-be+SP^{p}-ŋga-Stem
e.g.	ùbê:qò:thò	ùbéŋgèqò:thó
3. Re.Pa.St.:	SP-a:-be+SP^{p}-Stem	SP-a:-be+SP^{p}-ŋga-Stem
e.g.	wâ:yê:qò:thò	wâ:yéŋgèqò:thó
d. Past		
1. Past:	SP-be:+Stem	ą-SP-b-aŋga+Stem
e.g.	úbê: qò:thò	ąkábáŋgà qò:thò

2. Pa.Pa.:	SP-be+SP^{p}-be:+Stem	SP-be+SP^{p}-ŋga-b-aŋga+Stem
e.g.	ùbébê: qò:thò	ùbéŋgàbáŋgà qò:thò
3 Re.Pa.Pa.:	SP-a:-be+SP^{p}-be:+Stem	SP-a:-be+SP^{p}-ŋga-b-aŋga+Stem
e.g.	wâ:yébê: qò:thò	wâ:yéŋgàbáŋgà qò:thò

e. Remote

1. Re.Pa.:	SP-a:-ba+Stem	
e.g.	wâ:bá qòthò	

B. Participial Sub-Mood

	Positive	Negative
a. Present		
1. Present:	SP^{p}-ba+Stem	SP^{p}-ŋga-bi+Stem
e.g.	ébà qò:thò	éŋgàbí qò:thò
2. Pa.Pr.:	SP^{p}-be+SP^{p}-ba+Stem	SP^{p}-be+SP^{p}-ŋga-bi+Stem
e.g.	èbébà qò:thò	èbéŋgàbí qò:thò
3. Re.Pa.Pr.:	SP^{p}-a:-be+SP^{p}-ba+Stem	SP^{p}-a:-be+SP^{p}-ŋga-bi+Stem
e.g.	à:yébà qò:thò	à:yéŋgàbí qò:thò
b. Future		
1. Future:	SP^{p}-zo-(ku)-ba+Stem	SP^{p}-ŋga-zu-(ku)-ba+Stem
e.g.	ézòbà qò:thò	éŋgèzùkúbà qò:thò
2. Pa.Fu.:	SP^{p}-be+SP^{p}-zo-(ku)-ba+Stem	SP^{p}-be+SP^{p}-ŋga-zu-(ku)-ba+Stem
e.g.	èbézòbà qò:thò	èbéŋgèzùkúbà qò:thò
3. Re.Pa.Fu.:	SP^{p}-a:-be+SP^{p}-zo-(ku)-ba+Stem	SP^{p}-a:-be+SP^{p}-ŋga-zu-(ku)-ba+Stem
e.g.	à:yézòbà qò:thò	à:yéŋgèzùkúbà qò:thò
c. Stative		
1. Stative:	SP^{p}:-Stem	SP^{p}-ŋga-Stem
e.g.	ê:qò:thò	éŋgèqò:thó

2. Pa.St.:	SP^p-be+SP^p:-Stem	SP^p-be+SP^p-ŋga-Stem
e.g.	èbê:qò:thò	èbéŋgèqò:thó
3. Re.Pa.St.:	SP^p-a:be+SP^p:-Stem	SP^p-a:-be+SP^p-ŋga-Stem
e.g.	à:yê:qò:thò	à:yéŋgèqò:thò

d. Past

1. Past:	SP^p-be:+Stem	SP^p-ŋga-b-aŋga+Stem
e.g.	ébê: qò:thò	éŋgàbáŋgà qò:thò
2. Pa.Pa.:	SP^p-be+SP^p-be:+Stem	SP^p-be:SP^p-ŋga b-aŋga+Stem
e.g.	èbébê: qò:thò	èbéŋgàbáŋga qò:thò
3. Re.Pa.Pa.:	SP^p-a:-be+SP^p-be:+ Stem	SP^p-a:-be+SP^p-ŋga-b-aŋga+ Stem
e.g.	à:yébê: qò:thò	à:yéŋgàbáŋgà qò:thò

e. Remote Past

1. Re.Pa.:	SP^p-a:-ba+Stem
e.g.	à:bá qò:thò

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