

- b. sebenz - iw
 sebenzyw Passive Glide Formation
 setshenzyw Labial Palatalization
 setshenzw Y-Deletion
 setshenzw "work (pass.)"
- c. phapham - iw
 haphamyw Passive Glide Formation
 phaphan yw Labial Palatalization
 phashan yw Labial Palatalization
 phashan w Y-Deletion
 phashanyw "awake (pass.)"

The following sample derivations illustrate that Labial Palatalization does not apply to a verb stem incorporating a [-passive] root.

(68) Sample Derivations

- a. bab-el-iw
 [-pass]
 babelyw Passive Glide Formation
 babelw Y-Deletion
 babelw "be bitter (appl.)(pass.)"
- b. khukhumal-is-iw
 [-pass]
 khukhumalisyw Passive Glide Formation
 khukhumalishw Y-Deletion
 khukhumalishw "swell, rise (pass.)"

4.3.2 The Locative Construction

Labial Palatalization here applies in locative bases ending in a labial consonant and a labial vowel. This is the most straightforward case of labial consonant-labial glide dissimilation. This type of dissimilation has been misunderstood along, because all analysts who have described it have failed to realize that the labial stop -

labial glide' dissimilation resulted in a 'labial stop - non-labial glide' sequence, and that it was this non-labial (i.e. palatal) glide that triggered Labial Palatalization. This analysis also explains why it is that in the passive construction the /w/ surfaces - after all it doesn't participate in the palatalization rule, and yet in the locative construction it is missing because it is the glide that gave rise to the palatal glide which triggered Labial Palatalization and was then deleted by the general Y-Deletion rule. Before supplying a few sample derivations to illustrate the occurrence of palatalization in this construction, let us distinguish between Labial Palatalization as formulated in (51) and in (66).

Let us call the formulation in (51), Labial Palatalization¹, while referring to that in (66) and as Labial Palatalization². We need to distinguish the two applications of Labial Palatalization because Labial Palatalization² is morphophonological i.e. its application is restricted to the passive construction, while Labial Palatalization¹ is general - applying whenever its structural description is met. While Labial Palatalization² may be termed morphophonological and harmonic, Labial Palatalization¹, on the other hand is phonological and non-harmonic. Here are some sample derivations of forms in the locative construction:

(69) Sample Derivations:

a.	e-si-mbo-ini	
	esimboini	Syllabification
	esimboeni	Vowel Lowering
	esimbueni	Labial Glide Formation
	esimbweni	Vowel/Glide Realization
	isimbyeni	Labial Dissimilation
	esimbeni	Y-Deletion
	esimbeni	"pickaxe (loc.)"

- b. e-moto-ini
 emotoini Syllabification
 emotoeni Vowel Lowering
 emotueni Labial Glide Formation
 emotweni Vowel/Glide Realization
 émotwêni "car (loc.)"
- c. e-si-gubhu-ini
 esigubhuini Syllabification
 esigubhwini Vowel/Glide Realization
 esigubhyini Labial Dissimilation
 esigujyini Labial Palatalization¹
 esigujini Y-Deletion
 ésigújini "calabash (loc.)"
- d. e-si-phuphuphu-ini
 esiphuphuphuini Syllabification
 esiphuphuphwini Vowel/Glide Realization
 esiphuphuphyini Labial Dissimilation
 esiphuphushyini Labial Palatalization¹
 esiphuphushini Y-Deletion
 csiphuphúshini "frothing beer (loc.)"

Example (a) illustrates the failure of Labial Palatalization¹ to apply to root-initial labials, while example (b) illustrates the derivation of a stem without a root-final labial consonant. In example (c), Labial Palatalization¹ applies as expected while example (d) illustrates the non-harmonic nature of Labial Palatalization¹, i.e. it fails to apply to the non-root initial labial stop /ph/ in the second syllable.

4.3.3 The Diminutive Construction

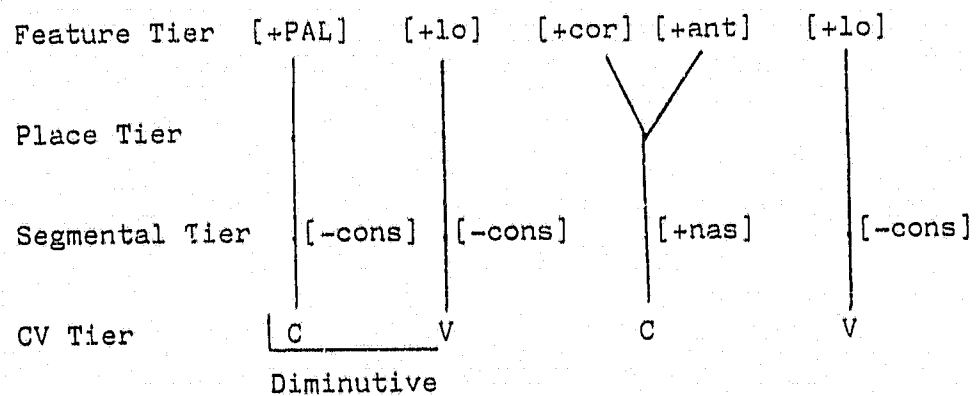
Palatalization in the diminutive construction applies to both labials and alveolars. This is illustrated in the following examples, previously supplied in (47):

(68) Examples:

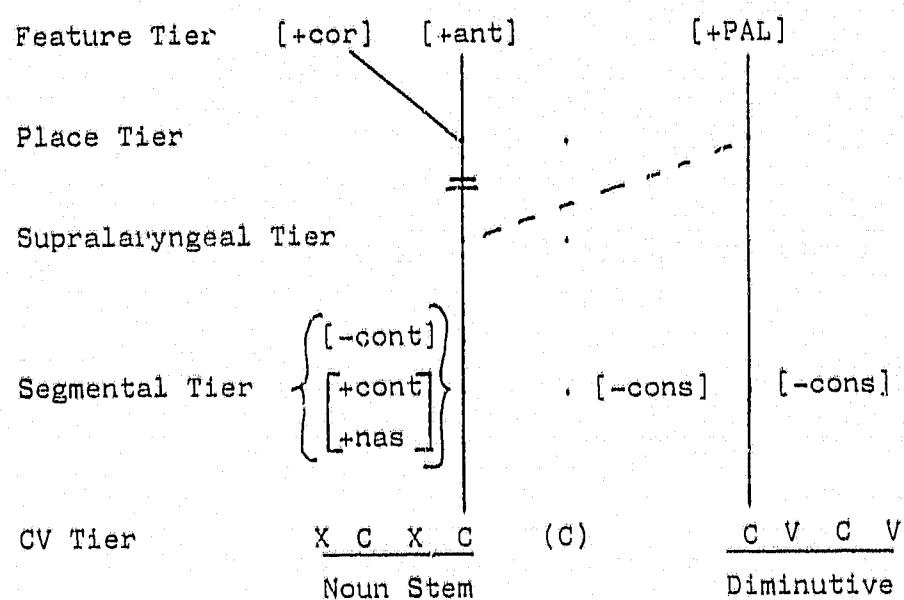
a.	í:kopí	+ í:kotshána	"cup (dim.)"
b.	ísigúbhu	+ ísigújana	"calabash (dim.)"
c.	úmlomo	+ umlónyana	"mouth (dim.)"
d.	í:khwaphá	+ í:khwashána	"armpit (dim.)"
e.	índlebé	+ índletshána	"ear (dim.)"
f.	isígodí	+ isígojána	"district (dim.)"
g.	ímóto	+ ímotshwána	"car (dim.)"
h.	íngáne	+ ínganyâna	"child (dim.)"
i.	ú:phuthú	+ ú:phushwána	"stiff porridge (dim.)"

The claim in the literature is that the diminutive suffix in Zulu is /-ana/ (e.g. Doke 1927:73-4). If that were true, we would be able to derive correct phonetic forms from nouns ending in a bilabial plus /i/, /o/, or /u/. In the case of /i/ it would be realized as a palatal glide and then trigger Labial Palatalization¹ while in the case of /o/ and /u/, first Labial Dissimilation would convert the resultant labial glide to a palatal glide and then again, Labial Palatalization¹ would be triggered. The problem arises with those nouns that end in a bilabial consonant and /e/ or /a/. There is no way in Zulu phonology that we can derive a palatal glide from these vowels. This forces us to reconsider the claim for /ana/ as the diminutive suffix. The trigger to palatalization in the diminutive is located, it seems, in the diminutive suffix rather than in the noun, because palatalization applies irrespective of the quality of the final vowel of the noun.

Fortunately, we do have one example that suggests that in earlier times the diminutive suffix may have incorporated a palatal glide which triggered the palatalization of an alveolar stop situated across a [-cons] segment. The example is an old form of the diminutive derived from the noun /índoda/ "man", viz. /índojeyâna/ "man(dim.)". (We cannot explain the origin of the vowel /e/ in this diminutive, but we feel that it is unlikely to form part of the suffix because if it did, it would surface in those nouns ending in high vowels which would be realized as glides before it). The suffix occurring in this word would seem to be /-yana/. This is the form that we wish to posit as the underlying diminutive suffix in Zulu.

(70) Diminutive Suffix

Again the morphophonological nature of the type of palatalization applying in the Diminutive Construction will be encoded in the [+PAL] autosegment and in the P-bearing segments (vis. anterior stops and nasals) to which it spreads. The palatalization of bilabials in the diminutive does not differ from that applying in the passive and locative, but the palatalization of alveolars will be treated as a different rule which we will term Alveolar Palatalization. The P-segment in Alveolar Palatalization will be represented by the feature [+PAL], while the P-bearing segments will be the root-final non-click alveolar stops or nasals of nominal stems.

(71) Alveolar Palatalization

Condition: The rule does not apply to a root-initial alveolar stop or nasal.

The rule states that the [+PAL] autosegment linked to the initial segment, viz. the glide, of the diminutive suffix spreads to the root-final alveolar stop or nasal. This rule differs from Labial Palatalization² in two respects:

- a. it applies to alveolar stops and nasals instead of labial stops and nasals.
- b. it applies to root-final segments only, not to other non-root initial segments also.

The following examples illustrate that the final vowel of the noun that takes a diminutive suffix is realized as a glide if it is [+bk], otherwise it deletes.

(72)

- | | | | | |
|----|----------------|---|------------------------|---------------------|
| a. | ímoto + yana | > | ímotshwāna | "car (dim.)" |
| b. | ísipúnu + yana | > | ísipúnywana | "spoon (dim.)" |
| c. | ísikéti + yana | > | ísikétsh'ana | "skirt (dim.)" |
| d. | íngéde + yana | > | íngéjana | "honey bird (dim.)" |
| e. | índoda + yana | > | índójana ¹⁴ | "man (dim.)" |

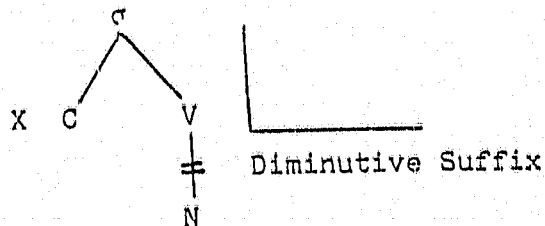
In order to account for this alternation, we propose a rule - Diminutive Delink - that delinks the final vowel of the noun from its nucleus tier as soon as diminutive affixation applies. After Diminutive Delink applies, then all the rules it triggers apply (see (4) Nucleus Delink)

(73) Diminutive Delink

Syllable Tier

CV Tier

Nucleus Tier



(74) Sample Derivations

- a. i-thuba-yana
 ithubayana Diminutive Delink
 ithubyana Vowel Deletion
 ithutsh'yana Labial Palatalization¹
 ithutsh'ana Y-Deletion
 ithútsh'ana "opportunity (dim.)"
- b. i-si-khathi-yana
 isikhathiyana Diminutive Delink
 isikhathyyana Vowel/Glide Realization
 isikhshyyana Alveolar Palatalization
 isikhashyana Y-Deletion
 isikhashana Y-Deletion
 isíkhashána "time (dim.)"

The following sample derivations illustrate that the type of palatalization that applies to labials differs from that applying to alveolars, and this supports our formulation of two different rules.

(75) Sample Derivations:

- a. i-si-gubhu -yana
 isigubhuyana Diminutive Delink
 isigubhwyana Vowel/Glide Realization
 isigubhyyana Labial Dissimilation
 isigujyyana Labial Palatalization¹
 isigujyana Y-Deletion
 isigujana Y-Deletion
 ísigüjana "calabash (dim.)"
- b. u-phuthu-yana
 uphuthuyana Diminutive Delink
 uphuthwyana Vowel/Glide Realization
 uphushwyana Alveolar Palatalization
 uphushwana Y-Deletion
 úphushwána "stiff porridge (dim.)"

- c. u-m-lomo-yana
 umlomoyana Diminutive Delink
 umlomuyana Labial Glide Formation
 umlomwyana Vowel/Glide Realization
 umlomyyana Labial Dissimilation
 umlopyyana Labial Palatalisation¹
 umlopyana Y-Deletion
 umlonyana Y-Deletion
 umlonyana "mouth(dim.)"
- d. i-moto-yana
 imotoyana Diminutive Delink
 imotuyana Labial Glide Formation
 imotwyana Vowel/Glide Realization
 imotsh'wyana Alveolar Palatalization
 imotsh'wāna Y-Deletion
 imotsh'wana "car(dim.)"

The main difference between Labial Palatalization¹ and Alveolar Palatalization illustrated in these sample derivations, is that in the latter a labial glide immediately following the newly formed palatal may surface, while in the former no such labial glide ever surfaces. This would seem to give strong support to the correctness first of Labial Dissimilation, which accounts for the disappearance of the labial glide immediately following a labial stop or nasal, and secondly to the correctness of the formulation of Labial Palatalization¹, where a following palatal glide triggers the palatalization of a preceding labial stop or nasal, and then deletes.

6.4 Conclusion

Our study of palatalization in Zulu has revealed that a non-root initial labial stop or nasal immediately followed by a palatal glide results in the formation of a palatal segment sharing some features with the labial segment, after which both the labial segment and the glide disappear. This we formalize as Labial Palatalization¹, a phonological rule that applies whenever its structural description is met. Labial Palatalization¹ applied in all constructions that we studied viz. the passive, locative and diminutive constructions.

The palatalization of alveolars, and that of bilabials "at-a-distance", we classify as morphophonological rules because they are restricted to the diminutive and passive constructions respectively. Alveolar Palatalization applies either when the palatal glide of the diminutive suffix immediately follows the alveolar stop/nasal, or "at-a-distance", i.e. when the alveolar stop/nasal is separated by the labial glide from the palatal glide triggering the palatalization. In both applications of palatalization "at-a-distance", i.e. Labial Palatalization² or Alveolar Palatalization where the noun ends in a labial vowel, our claim is that only P-bearing segments are 'visible' to the P-segment i.e. [+PAL] feature. We do not have any independent support for this claim, and we want to admit that this is the weak link in our analysis of palatalization in Zulu. Further research is bound to shed a better light on how this phenomenon should be explained.

On the positive side, we claim that this analysis has provided the 'missing' glide which, in each case, triggers palatalization. This provides support for the Givon-Voeltz-Stahlke-Ohala analysis mentioned in 4.1

Labial Palatalization¹ demonstrates that not all occurrences of palatalization are morphophonological, as Herbert (1977a) claims. It is our belief that palatalization cannot be explicated without an understanding of Labial Dissimilation and Y-Deletion.

Let us end by supplying the list of alternating segments in all forms of palatalization.

(76) Alternating Segments

Bilabial	Alveolars
bh - j	d - j
ph - sh	th - sh
p' - tsh'	t' - tsh'
b - tsh'	n - ny
m - ny	nd - nj
mb - nj	nt' - ntsh'
mp' - ntsh'	

NOTES TO CHAPTER 4

1. For vowels there is a redundancy in Zulu in the features [back] and [labial] i.e. [+back] vowels are also [+labial] while [-back] vowels are also [-labial]. This is not the case, however for consonants. When employing the feature [labial], therefore, we will not also use [back] when dealing with vowels:

Vowels	i	e	a	o	u
High	+	-	-	-	+
Labial	-	-	-	+	+
Low	-	-	+	-	-

2. The full form of the underlying locative prefix (i.e. the first morpheme) is /se/, the /s/ deletes when the prefix is word-initial.
3. In most morphological descriptions of Zulu, for instance, the independent possessive initial vowel is presented as /a ~ e ~ o/ with a note on their distribution stating that they occur in independent possessives where the initial vowel of the noun which forms the possessive base is /a, i or u/ respectively.
4. The possessive marker is sometimes referred to as the possessive particle or possessive morpheme.
5. The focus in this thesis is on phonological rules, and not on morphological, i.e. word-formation rules. For that reason, we do not provide all the word-formation rules that apply in the derivations, but we only refer to the application of a word-formation rule when it triggers some phonological rules. We do not even specify the word-formation rule, we just refer to the application of an affixation rule.

6. Doke gives the following rule for the formation of this demonstrative:
 "... prefix /l/ to the relative concord" (Doke 1927: 92).
 Again, this 'underlying structure' already incorporates the output of vowel coalescence.
7. Depressor Shift, a rule we will meet in Chapter 5, does not shift a high tone associated with a bimoric vowel.
8. To represent a bimoric vowel, we will either use a single orthographic letter representing the vowel followed by a colon, as in this example, or just two orthographic letters of the vowel.
9. When, as a consequence of Syllable Delinking, a geminate vowel and a short vowel are co-linked onto one syllable node, it is the geminate structure that survives the deletion of one of the vowels.
10. We have not formalized this rule, but it is a low-level rule that shortens the vowel of the relative marker.
11. See appendix, for a discussion of /be/ "past tense morpheme", /se/ "already", and other tense/aspect morphemes.
12. In fast speech optional Post-lexical Deletion applies with full-word boundaries:
 wâbe usebénza OR wâb'usébenza "You were working"
 ízobe isebénza OR ízob'isebénza "It will be working"
13. 'Root-initial' in this context also includes examples like 47a, where, strictly speaking, the bilabial consonant is the first C in the root. In such an example the initial vowel syllabifies with whatever is prefixed to the root, and the bilabial consonant then functions like a root-initial segment.
14. This form is now more commonly used than "indojoyâna"

CHAPTER 5TONAL RULES1. Introduction

It is not possible, within the confines of one chapter to discuss all the tonal rules of Zulu. We shall, however, attempt to discuss the most important of them by focussing on those tonal rules that apply to the verb. There are two reasons for our choice. First, the majority of the general rules of the language apply in the verbal construction. Secondly, the choice is actually between the nominal and verbal constructions, and we chose the verb because much fewer general rules apply in the nominal construction and, furthermore, the majority of analyses presented so far have had the noun as their focus, e.g. Rycroft (1963) ("Tone in Zulu Nouns"); Laughren (1984) ("Tone in Zulu Nouns") and Clark (forthcoming) ("An Accentual Analysis of the Zulu Noun").

In this study, we will not discuss phonetic realization rules. Any interested reader may refer to Khumalo (1981: Chapter 2) for a detailed discussion of such rules. There is, however, a great difference between the analysis presented in Khumalo (1981), (1982), and this one, in the way phonological rules are perceived. Lexical rules such as Leftward Shift, Leftward Spread, and the post-lexical rules Left Branch Delink, High Dissimilation and Phrase Final Lowering were not used in that analysis, and yet they form the core of the present analysis.

It is the autosegmental framework adopted in this analysis which facilitates the incorporation of these rules which, we believe, are more explanatory than those employed in the previous analysis. In this analysis, we also use extratonicity, which enables us to consider a tone-bearing unit on the periphery to be "invisible" to certain tone rules. We shall attempt, as this analysis develops, to point out the differences in the analyses, and to indicate any advantages of the one over the other. We wish to point out also that a

number of insights of the previous analysis are incorporated in the present description; for instance the notions of "syllable prominence" and the "dominance hierarchy" which will be discussed in due course.

We have attempted in this analysis to supply a solid data base. Many tonal descriptions of South African languages that have appeared recently have been weak in this respect. Some have either had faulty data to analyse or the data has just been incomplete. Some analysts pay no attention, for instance, to the different tonal configurations of words in phrase medial and phrase final positions. Perhaps we have gone to the other extreme of supplying too much data, but that, we feel, will assist the reader in evaluating this analysis, and in enabling him to work out a different analysis.

Three tiers are employed in the autosegmental framework employed here for the description of tone: the tonal tier; the segmental tier, and the tone-bearing unit tier whose members are the V's of the CV tier.

Our tone rules will be of two main types - phonological and phonetic. Phonological rules will be those that apply to tone-bearing units and tones only, with consonants completely invisible. These rules will be the lexical and post-lexical tone rules of the language. Phonetic rules, on the other hand, will be the rules that apply to the tonal and segmental tiers. These will be rules like Depressor Shift, i.e. rules that are affected, for instance, by the presence or otherwise of depressors. But as we previously stated, phonetic realization rules such as Low Tone Raising - the assimilation of low tones to high tones in the environment (see Khumalo 1981: 110-119) will not be discussed.

In the majority of Zulu tonal analyses that have appeared (e.g. Lanham (1960); Rycroft (1963); Cope (1966); Khumalo (1981, 1982); Laughren (1984)), the Zulu tonemic system has been described as comprising two phonological tones, viz. high and low. In the present analysis, we posit only one underlying tone, viz. the high tone. The low tone is the

default tone supplied by a redundancy rule at the conclusion of the phonological component. In other words, phonological rules apply to high tones and vowels only, while phonetic rules apply to high and low tones, and to vowels and consonants. Low Tone Default - the redundancy rule that specifies low tones - forms the line of demarcation between the phonological and phonetic tone rules of Zulu. In her analysis, Clark (forthcoming) also has the high tone as the only underlying tone, deriving the low tone also by a default rule, but her position is that "Zulu is a tonal pitch-accent language with the tonal melody 'H'" (p.7). There is no real difference between her conception and ours of the Zulu tonemic system. The difference lies in the way we conceive of the linking of the tonal and segmental tiers that make up Zulu morphemes. In her analysis, some morphemes are marked "for the position of the tonal accent in relation to the segmental string" (p.7). In other words, the high tone in some morphemes is prelinked to a designated vowel.

In our analysis, all associated tones are prelinked (i.e. linked before the application of any other rule) to designated vowels. In Clark's analysis, the only examples she provides of unspecified linking (i.e. where 'H' is not 'prelinked') are those where the 'H melody' links by Wellformedness conditions to the leftmost tone-bearing unit.

Following Clark, we will also have double-linking (i.e. the linking of a high tone to two tone-bearing units) underlyingly specified. Single linking and double linking then will distinguish the stems which are usually specified as HL and HH stems. (The latter representation, of course, is ruled out by the provisions of the Obligatory Contour Principle¹).

The low tone, as we indicated earlier, is the default tone which is specified by a rule we term Low Tone Default:

(1) Low Tone Default



(where v^1 = a tone-bearing unit not linked to a tone)

This is a rule that applies after all the phonological rules have applied, and it links each unassociated (i.e. unlinked) vowel with a low tone.

The only Well-Formedness Condition required in this analysis is the Crossed Lines Constraint, i.e. association lines do not cross.

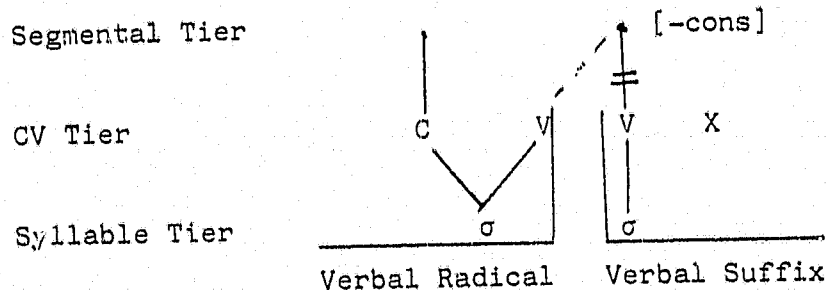
Finally, in this description of verb tonology, we will attempt to discuss the main moods of the verb in the following order: infinitive; indicative participial; indicative principal and then the subjunctive mood. The conditional and imperative 'moods' will be mentioned in passing, but they will not be examined in detail as they do not materially differ in their tonology from that of the main moods. (These moods and tenses are outlined in the Appendix).

2. The Infinitive

We will commence our discussion of Zulu tonology by presenting the different segmental types of verbal radicals as they occur in the infinitive. First of all, we wish to point out that we distinguish between verbal radicals and verbal stems. A verbal stem is made up of a verbal radical² and a tense suffix. Verbal radicals and verbal stems in our analysis both end in a vowel. Verbal radicals in most current descriptions of Zulu segmental and tonal phonology are represented as morphemes ending in a consonant. This runs counter to the notion that the lexical entries of a language should be phonologically well formed. It is a claim of Clements and Keyser (1983) which we share, that morphemes are fully syllabified in the underlying representation. In the case of Zulu, this means that all the syllables of the morpheme must conform to the structure of its core syllables, viz. CV and V. The final syllable of every morpheme, therefore, and that includes verbal radicals, must incorporate a vowel in the case of Zulu. The terminating vowel of a verbal radical, we

claim, is unspecified for place of articulation features, and it acquires these (when the verbal radical and a verbal suffix come together) by a spread rule we term suffixation.

(2) Suffixation



We will use the letter "V" to represent this terminating vowel of the verbal radical. Let us now return to a consideration of verbal radicals in the infinitive construction:

2.1 Infinitive, Positive - Excluding Object Prefix

2.1.1 Phrase-Final Position

(3) Examples:

a.	úku:fá ##	"to die"	(u-ku-f-a)
b.	ukú:wa ##	"to fall"	(u-ku-w-a)
c.	ú ^l kô:na ##	"to spoil, sin"	(u-ku-on-a)
d.	ukwé:hla ##	"to alight"	(u-ku-ehl-a)
e.	ukúhle:ka##	"to laugh"	(u-ku-hlek-a)
f.	úkuhá:mbâ##	"to go"	(u-ku-hamb-a)
g.	úkubô:na##	"to see"	(u-ku-bon-a)
h.	úkwesá:ba##	"to be afraid"	(u-ku-esab-a)
i.	ukwéthu:k ##	"to get a fright"	(u-ku-ethuk-a)
j.	ukúsebé:nzâ##	"to work"	(u-ku-sebenz-a)
k.	uk:hláku:la##	"to weed"	(u-ku-hlakul-a)

The examples in (3) do not present a clear picture of the underlying location of the high tones. The initial high tone in examples (a) - (j) is either associated to the initial vowel or to the vowel of the second syllable of the word, while in

example (k) it is associated with the third syllable of the word. It was Rycroft (1963) who first suggested that this initial high tone is associated with the initial vowel of the noun prefix (he didn't state it as precisely since he claimed that the high tone was associated with the full noun prefix, i.e. the noun prefix incorporating the initial vowel and he specified it as H^{fp} i.e. high tone, full prefix). That this high tone was associated with the full noun prefix he demonstrated by comparing the tonal patterns of nouns with full prefix with those of nouns occurring without the initial vowel, e.g. in vocatives and in forms occurring after negative frames like "akukho ____" ("there isn't/aren't any ____").

Let us consider the tonal patterns of the forms in (3) when they occur without the initial vowel of the infinitive prefix (The infinitive prefix is considered a nominal prefix):

(4) Examples:

- a. akúkho ku:fá##
- b. akúkho ku:wa##
- c. akúkho kô:na##
- d. akúkho kwe:hla##
- e. akúkho kuhle:ka##
- f. akúkho kuhá:mba##
- g. akúkho kubô:na##
- h. akúkho kwesá:ba##
- i. akúkho kwethu:ka##
- j. akúkho kusebé:nzá##
- k. akúkho kuhlaku:la##

In the absence of the initial vowel of the infinitive prefix, there is no high tone associated with the prefix /ku/, nor with the verbal radical in (4)k (in example (4)c, it will be shown later that the high-low tone cluster is associated with the initial vowel of the verb, viz. /o/) This suggests that this initial high tone is underlyingly associated with the initial vowel of the prefix, and that in some environments it shifts by rule either to the prefix /ku/ or to one of the

syllables of the verbal radical. The underlying
 re, ions for the infinitives in (3) would then seem to
 be, following:

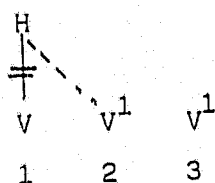
(5) Underlying Representations

- a. $\begin{bmatrix} H \\ | \\ uku \end{bmatrix} \begin{bmatrix} H \\ | \\ fv \end{bmatrix} \begin{bmatrix} a \end{bmatrix}$
- b. $\begin{bmatrix} H \\ | \\ uku \end{bmatrix} \begin{bmatrix} wV \end{bmatrix} \begin{bmatrix} a \end{bmatrix}$
- c. $\begin{bmatrix} H \\ | \\ uku \end{bmatrix} \begin{bmatrix} H \\ \diagdown \diagup \\ onV \end{bmatrix} \begin{bmatrix} a^3 \end{bmatrix}$
- d. $\begin{bmatrix} H \\ | \\ uku \end{bmatrix} \begin{bmatrix} ehV \end{bmatrix} \begin{bmatrix} a \end{bmatrix}$
- e. $\begin{bmatrix} H \\ | \\ uku \end{bmatrix} \begin{bmatrix} hlekV \end{bmatrix} \begin{bmatrix} a \end{bmatrix}$
- f. $\begin{bmatrix} H \\ | \\ uku \end{bmatrix} \begin{bmatrix} H \\ | \\ hambV \end{bmatrix} \begin{bmatrix} a \end{bmatrix}$
- g. $\begin{bmatrix} H \\ | \\ uku \end{bmatrix} \begin{bmatrix} H \\ \diagdown \diagup \\ bonV \end{bmatrix} \begin{bmatrix} a^3 \end{bmatrix}$
- h. $\begin{bmatrix} H \\ | \\ uku \end{bmatrix} \begin{bmatrix} H \\ | \\ esabV \end{bmatrix} \begin{bmatrix} a \end{bmatrix}$

- i. $\begin{bmatrix} H \\ | \\ \text{uku} \end{bmatrix} \begin{bmatrix} \text{ethukV} \\ | \\ a \end{bmatrix}$
- j. $\begin{bmatrix} H \\ | \\ \text{uku} \end{bmatrix} \begin{bmatrix} H \\ | \\ \text{sebenzV} \\ | \\ a \end{bmatrix}$
- k. $\begin{bmatrix} H \\ | \\ \text{uku} \end{bmatrix} \begin{bmatrix} \text{hlakulV} \\ | \\ a \end{bmatrix}$

The high tone on the initial vowel of the prefix shifts in examples (3)b, d, e, i, j and k. In all cases where it shifts, the vowel onto which it shifts is unassociated, and it is followed by another unassociated vowel. As a first approximation, let us represent this lexical rule as follows:

(6) Rightward Shift



Iterative if no other H occurs to the right.

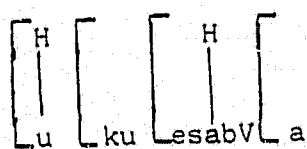
(V^1 = unassociated vowel)

The rule states that an associated high tone spreads onto the unassociated vowel to its right on condition the next vowel to the right is also unassociated. The high tone then detaches from the vowel to which it was originally associated. For the rule to apply, vowel 3 must be unassociated, otherwise, as examples (3) a, f. and g. illustrate, the high tone does not shift. The rule applies iteratively if the high tone is the rightmost in the word (see sample derivation (11)c. where the only high tone in the word (and therefore the rightmost) shifts iteratively). Later, in sample derivation (36), we will illustrate

that a high tone which is not rightmost in the word fails to shift iteratively even when the structural description for Rightward Shift is met.

Rightward Shift does not apply to (3) h. also, as the following derivation illustrates:

(7) Sample Derivation



k u esaba

Suffixation and NP Affixation

k u esaba

Syllabification

k w esaba

Vowel/Glide Realization

u k w esaba

Initial Vowel Affixation

úkwesába

"to be afraid"

In the sample derivation above, the environment for Rightward Shift was removed by the application of the segmental rules in the preceding cycle. Rightward Shift also does not apply to (3)c, whose vowel 2, after the application of segmental rules in the preceding cycle, would be associated with the high tone. The rule applies as expected in examples (3)b, d, and j, but in examples (3)e, i, and k the rule stops one syllable short of our expectation, i.e. the last two syllables in all three examples are unassociated, and one would have expected the high tone to shift iteratively to the penultimate syllable of the word, but it doesn't. In order to explain the failure of Rightward Shift to apply in these three examples, we wish to appeal to the notion of extratonicity: "A constituent at the edge of a tonal domain may be 'invisible' for the purposes of tonal rules." (Pulleyblank 1983: 228).

This notion of peripherality was suggested to us by two of the latest analyses of Nguni tonology. In Goldsmith et al (forthcoming) in some tenses "... the Final vowel is extrametrical for purposes of Accent Placement." (p.13)

In that analysis it is the position of the accent that determines the location of the high tone, i.e. the high tone is associated with the accented syllable as a result of the application of the rule Goldsmith terms Attraction to Accent. In most tenses, in Goldsmith's analysis, Accent Placement locates accent on the penultimate syllable, while in other tenses it places accent on the penultimate syllable when the final syllable of a polysyllabic stem has been marked extrametrical, and therefore invisible to the rule.

In her analysis also, Clark (forthcoming) employs extratonicity: "Mark the final syllable of a multi-syllabic stem as 'extra tonal'" (Clark (forthcoming), p.8). Even though we cannot find any independent support for the notion of extratonicity, yet we employ it because the choice is between it and an Antepenult Shift Rule to account for the high tone in the antepenultimate syllable in examples such as (3)k. The advantage of the incorporation of extratonicity to the analysis is that it generalizes the application of Rightward Shift and rules out the necessity for an extra tonal rule. The verbal radicals undergoing Extratonicity Marking in Zulu are the disyllabic consonant-commencing forms and all other longer radicals. This is how the affected verbal radicals in (3) will be marked at the application of Rightward Shift:

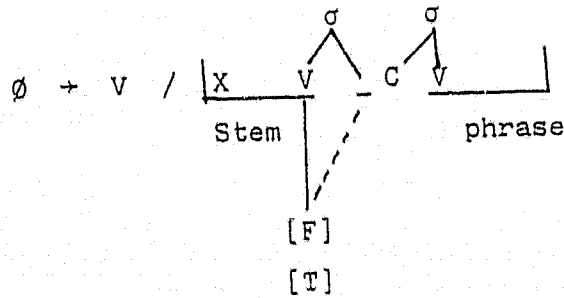
(8) Extratonicity Marking

- a. úkuhle(ka)
- b. úkuhá(mbà)
- c. úkubó(ná)
- d. úkwesá(ba)
- e. úkwethu(ka)
- f. úkusebé(nzā)
- g. úkuhlaku(la)

In order to illustrate the application of Rightward

Shift, we need to consider a post-lexical rule termed Prepausal Lengthening:

(9) Prepausal Lengthening



Condition: All syllables are [-stress]

In this intonational rule, a vowel is epenthesized to the penultimate phrase-final syllable. The epenthesized vowel gets linked to all segmental [F] and tonal [T] features of the tautosyllabic vowel to its left. The [-stress] condition is required because Prepausal Lengthening does not apply to a word incorporating a stressed syllable (see Khumalo 1981: 89-91).

(10) Examples:

- a. Bafúna uba? "Who do they want?" NOT Bafúna*u:ba
 b. Uyabó? "You see?" NOT *Uya:bó?
 c. Láthi ǵilikidi "It (cl.5) fell" NOT Láthi ǵiliki:di

(In the examples in (10), two lines are drawn under the stressed syllable).

Here, now, are a few sample derivations of some of the infinitives in (3).

(11) Sample Derivations:

- a. $\left[\begin{array}{c} \text{H} \\ | \\ \text{uku} \end{array} \right] \left[\begin{array}{c} \text{H} \\ | \\ \text{fv} \end{array} \right] \left[\begin{array}{c} \text{H} \\ | \\ \text{uku} \end{array} \right] \left[\begin{array}{c} \text{H} \\ | \\ \text{wV} \end{array} \right] \left[\begin{array}{c} \text{H} \\ | \\ \text{a} \end{array} \right]$
phrase phrase

úkuufá

úkũũfá

ukúwa

ukúúwa

ùkúúwà

Lexical Component

Rightward Shift

Post-Lexical Component

Prepausal Lengthening

Low Tone Default

b.	$\begin{array}{ c } \hline H \\ \hline \end{array} \begin{array}{ c } \hline \text{uku} \\ \hline \end{array} \begin{array}{ c } \hline \text{hle} \\ \hline \end{array} \begin{array}{ c } \hline V \\ \hline \end{array} \begin{array}{ c } \hline a \\ \hline \end{array} \begin{array}{ c } \hline H \\ \hline \end{array} \begin{array}{ c } \hline \text{uku} \\ \hline \end{array} \begin{array}{ c } \hline \text{sebenz} \\ \hline \end{array} \begin{array}{ c } \hline V \\ \hline \end{array} \begin{array}{ c } \hline a \\ \hline \end{array}$		
	phrase	phrase	
	úkuhle(ka)	úkusebé(nza)	<u>Lexical Component</u>
	ukúhle(ka)	ukúsebé(nza)	Extratonicity Marking
	ukúhleka	ukúsebénza	Rightward Shift
			Removal of Extra- tonality
			<u>Postlexical Component</u>
	ukúhleeka	úkusebéénza	Prepausal Lengthening
	ùkúhlèèkà	ùkúsèbéénzà	Low Tone Default

c.	$\begin{array}{ c } \hline H \\ \hline \end{array} \begin{array}{ c } \hline \text{uku} \\ \hline \end{array} \begin{array}{ c } \hline \text{hlaku} \\ \hline \end{array} \begin{array}{ c } \hline V \\ \hline \end{array} \begin{array}{ c } \hline a \\ \hline \end{array}$		
	phrase		
	úkuhlaku(1a)		<u>Lexical Component</u>
	ukúhlaku(1a)		Extratonicity Marking
	ukuhláku(1a)		Rightward Shift
	ukuhlákula		Rightward Shift
			Removal of Extra- tonality
			<u>Postlexical Component</u>
	ukuhlákuula		Prepausal Lengthening
	ùkúhlákùùlà		Low Tone Default

There is no essential difference between our formulation of the rule, Rightward Shift, and Clark's (forthcoming). Laughren (1984) terms the rule Tonal Metathesis, since in her analysis both high and low tones are recognized in the underlying representation. We consider our formulation more explanatory than Tonal Metathesis because it captures, for instance, the relationship between two Zulu dialects which are distinguished by the application or otherwise of delinking when the high tone spreads from the initial vowel to the basic prefix vowel.

(12) Dialectal Variation⁴

	<u>Dialect A</u>	<u>Dialect B</u>	
a.	ukúwa	úkúwa	"to fall"
b.	ukúgèzà	úkúgèzà	"to wash"
c.	isítsha	ísítsha	"dish"
d.	amádòdà	ámádòdà	"men"
e.	isíbhāmú	ísíbhāmú	"gun"

(Adjacent high tones which result through the failure of delinking to apply after the spread of a high tone are marked by the absence of downstep between them, as is illustrated by all the examples in dialect B).

If we return to the examples in (3), we realize that Rightward Shift and Prepausal Lengthening apply to examples (b), (d), (e), (i), (j) and (k), while only the latter rule applies in (a), (f) and (h). This leaves us with two examples, viz. (3)(c) and (g) to account for. In both examples, a high-low tone cluster occurs on the penultimate syllable of the word.

The evidence at our disposal suggests three possible sources of high-low tone clusters:

- (a) Where the first mora of a bimoric vowel is underlyingly associated with a high tone, e.g. the remote past tense marker ^H/aa/ as in /ngā:hle:ká/ "I laughed".
- (b) Where a high tone associated with a syllable incorporating a depressor is shifted by Depressor Shift (see (64) in this chapter) to a low toned bimoric vowel, as in /izihlā:lo/ "chairs" cf. /isíhla:lo/ "chair".
- (c) Where either lexically or in the course of a derivation, the vowels of the penultimate and final syllables become linked to a single high tone which later rules convert to a high-low tone cluster.

In Zulu there are two types of high-toned CVCV radicals as illustrated in the infinitives /úkuhámbà/ and /úkubōna/. According to Westphal (1951) and Rycroft (1980), radicals of the first type derive from radicals with long vowels in Proto-Bantu while those of

the second type derive from radicals with short vowels in Proto-Bantu. This original dichotomy in high-toned CVCV radicals is maintained in Zulu tonology and manifests itself in the examples cited above. In the underlying structure, the first type of high-toned CVCV radicals had its root vowel associated with a high tone, while in the second type, the high tone is linked to both the root vowel and the terminating 'V' slot. Different rules apply to these structures producing phonetic form which in phrase final position incorporate a single high tone for the first type of high-toned CVCV radicals, and a high-low tone cluster for the second type. (In Goldsmith (forthcoming) those CVCV radicals that we specify as doubly-linked to a high tone, are described as radicals triggering Accent Hopping, a rule which, after placement of accent, shifts that accent to the right). Here are examples from different categories of roots where either one vowel or two vowels are linked to a high tone:

(13)

a. noun $\begin{bmatrix} H \\ | \\ [a] \end{bmatrix} [ma] \begin{bmatrix} H \\ / \backslash \\ [khosi] \end{bmatrix} \rightarrow \acute{a}makh\acute{o}:si$ "kings, chiefs"
phrase

b. noun $\begin{bmatrix} H \\ | \\ [a] \end{bmatrix} [na] \begin{bmatrix} H \\ | \\ [khabe] \end{bmatrix} \rightarrow \acute{a}makh\acute{a}:be$ "watermelons"
phrase

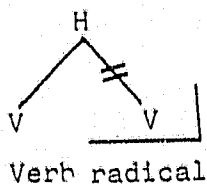
c. noun $\begin{bmatrix} H \\ | \\ [i] \end{bmatrix} [si] \begin{bmatrix} H \\ / \backslash \\ [hlabathi] \end{bmatrix} \rightarrow is\acute{i}hlab\acute{a}:thi$ "sand"
phrase

d. noun $\begin{bmatrix} H \\ | \\ [i] \end{bmatrix} [si] \begin{bmatrix} H \\ | \\ [gebengu] \end{bmatrix} \rightarrow is\acute{i}g\acute{e}b\acute{e}:ng\grave{u}$ "criminal"
phrase

- e. adjective $\begin{bmatrix} H \\ | \\ a: \end{bmatrix} \begin{bmatrix} \bar{b} \end{bmatrix} \begin{bmatrix} H \\ | \\ \text{khulu} \end{bmatrix} \rightarrow \text{ábakhû:lu} \quad \text{"big (cl.2)"}$
- f. adjective $\begin{bmatrix} H \\ | \\ a: \end{bmatrix} \begin{bmatrix} \bar{b} \end{bmatrix} \begin{bmatrix} H \\ | \\ \text{ncane} \end{bmatrix} \rightarrow \text{ábancá:ne} \quad \text{"small (cl.2)"}$
- g. relative $\begin{bmatrix} H \\ | \\ a: \end{bmatrix} \begin{bmatrix} \bar{b} \end{bmatrix} \begin{bmatrix} H \\ | \\ \text{mpofu} \end{bmatrix} \rightarrow \text{áb'ám'pô:fu} \quad \text{"light complexion-} \\ \text{ed (cl.2)"}$
- h. relative $\begin{bmatrix} H \\ | \\ e: \end{bmatrix} \begin{bmatrix} \bar{l} \end{bmatrix} \begin{bmatrix} H \\ | \\ \text{munyu} \end{bmatrix} \rightarrow \text{é'lím'ú:nyu} \quad \text{"sour (cl.5)"}$

In the verbal construction, the distinction between the two types of high-toned CVCV radicals is preserved only in two constructions viz. the infinitive and the indicative participial submood. Elsewhere the two classes collapse into one. We need a rule, therefore, to dissolve the double-linking into the other constructions:

(14) Right Branch Delink

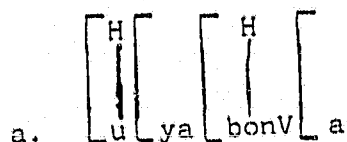


Condition: This rule applies in all environments excepting the infinitive and the indicative participial submood.

Before supplying sample derivations to illustrate the application of the rule above, we wish to point out that the distinction between these two types of high-toned roots is never neutralized in non-verbal constructions such as those illustrated in (13).

Right Branch Delink is a very early lexical rule.

(15) Sample Derivations



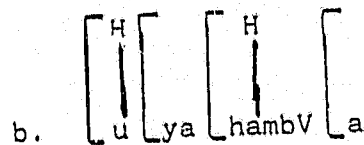
úyabóná

Suffixation

úyabóna

Right Branch Delink

úyabóna "he sees"



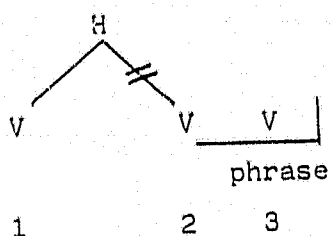
úyahám̃ba

Suffixation

úyahám̃bà "he goes"

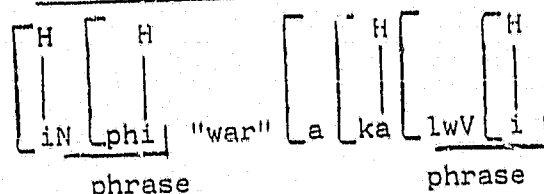
In the post-lexical component of the phrase-final forms, in addition to Prepausal Lengthening, we need two other rules in the derivation of examples (5)(c) and (g).

(16) High Dissimilation

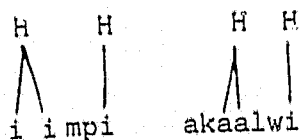


Condition: Vowel 3 must also be associated with a high tone.

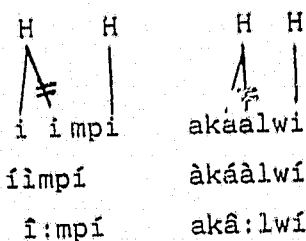
Vowel 3 may either be individually linked to a high tone as in the examples in (17), or it may be co-linked to the high tone of a vowel of the penultimate syllable as we shall see in (19). This is the reason for the condition. We call this rule High Dissimilation because in a phrase-final sequence of three high tones, the one in the middle dissimilates from the other two by delinking from the high tone node.

(17) Sample Derivations

"he does not fight"

Post-lexical Component

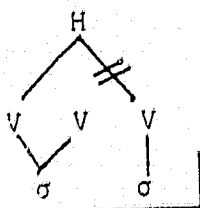
Prepausal Lengthening



High Dissimilation

Low Tone Default

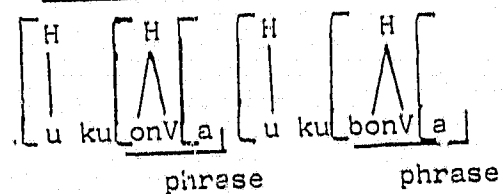
Examples where the final vowel shares the same high tone with the vowels of the penultimate syllable will be supplied after Phrase Final Lowering has been introduced.

(18) Phrase Final Lowering

phrase

This rule delinks the right branch of a high tone co-linked to a vowel of the penultimate syllable and that of a final syllable, on condition the root in which they occur is in phrase final position.

(To indicate phrase final and phrase medial positions, we will mark the boundaries 'phrase' and 'word' respectively.)

(19) Sample Derivations

úkuóná	úkubóná
úkuóná	—
úkwóná	—
úkyóná	—
úkóná	—

Lexical Component

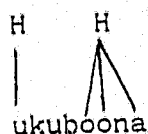
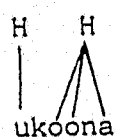
Suffixation

Syllabification

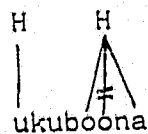
Vowel/Glide Realization

Labial Dissimilation

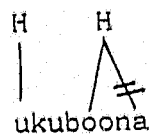
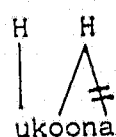
Y-Deletion

Post-Lexical Component

Prepausal Lengthening



High Dissimilation



Phrase Final Lowering

úkóðná

úkùbóðná

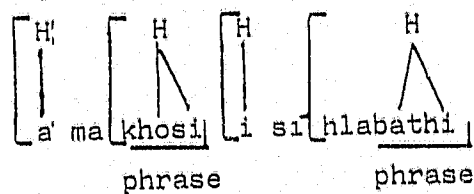
Low Tone Default

úk'ò:na

úkubò:na

"to spoil, sin" "to see"

These rules apply in non-verbal constructions as well:

(20) Sample Derivations

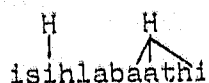
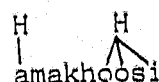
ámakhó(sí)	isihlabá(thí)
—	isihlabá(thí)
ámakhósi	isihlabáthi

Lexical Component

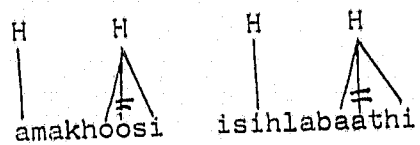
Extratonicity Marking

Rightward Shift

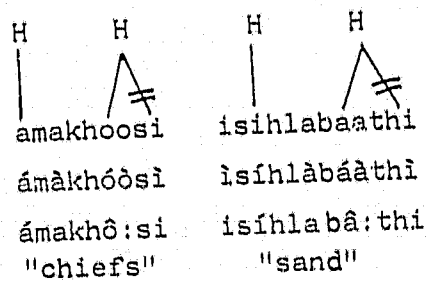
Removal of Extratonicity

Post-lexical Component

Prepausal Lengthening



High Dissimilation

Phrase Final Lowering
Low Tone Default

Right Branch Delink conditions dialectal variation in the infinitive because in that construction it does apply in the Natal Coast dialects.

(21) CVCV - Dialectal Variation

KwaZulu Dialects	Natal Coast Dialects	Gloss
úkubô:na	úkubó:na	"to see"
úkufû:na	úkufú:na	"to want"
úkuthâ:ndâ	úkuthá:ndâ	"to like"

Let us now list all the tonal rules that have applied to positive infinitives in phrase final position.

(22) Rule Summary

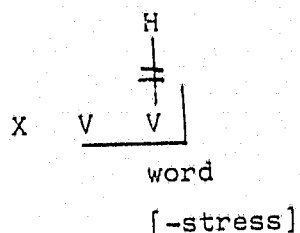
- a. Lexical Rules:
- i. Right Branch Delink
 - ii. Extratonicity Marking
 - iii. Rightward Shift
 - iv. Removal of Extratonicity
- b. Post-Lexical Rules:
- i. Prepausal Lengthening
 - ii. High Dissimilation
 - iii. Phrase Final Lowering
- c. Default Rule: Low Tone Default

2.2.1 Infinitives - Positive - Phrase Medial Position

(23) Examples:

a.	úkuma##	"to stand, stop"
b.	ukúlwa##	"to fight"
c.	úkweba##	"to steal"
d.	ukwénzâ##	"to do"
e.	ukúpheka##	"to cook"
f.	úkuphúza##	"to drink"
g.	úkubona##	"to see"
h.	úkwethúka##	"to insult, abuse"
i.	ukwéthuka##	"to get a fright"
j.	ukúkhulúma##	"to talk"
k.	ukuthákatha##	"to bewitch"

We need two more post-lexical rules to account for the infinitives above. The first of these rules we will call Phrase Medial Lowering.

(24) Phrase Medial Lowering

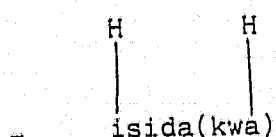
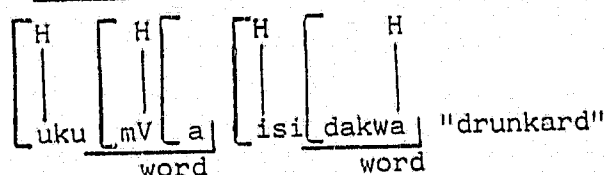
The rule states that a word-final high tone on an unstressed syllable of a word in phrase medial position, delinks from the vowel to which it is associated.

This rule may be explained in terms of syllable prominence. Prominence, which is discussed at length in Khumalo (1981) pp.59-61, is manifested through stress, tone (i.e. high tone), duration (i.e. vowel length) and penultimate syllable position.

"Penultimate syllable prominence (PSP) which is marked with the feature [+prominence], is a lexical feature of stems. The distinct features of [+stress] ... 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. bimoric) vowel or

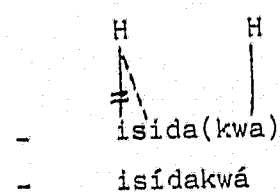
of a stressed vowel takes precedence over PSP and consequently [+prominence] deletes in the presence of [+stress] or of a final bimoric syllable." (Khumalo 1981 : 59). It is further stated that on the whole the tonal rules of Zulu are rules that regulate the occurrence of tonal prominence. In phrase-final forms, a high tone in the final syllable does not create any imbalance in prominence because the penultimate syllable has both penultimate syllabic prominence and vowel length prominence. Tonal prominence on the final syllable when the penultimate syllable is short, however, does create an imbalance in prominence which is corrected by removing it (i.e. tonal prominence) from the final syllable by delinking the high tone from the final syllable.

(25) Sample Derivations



Lexical Component

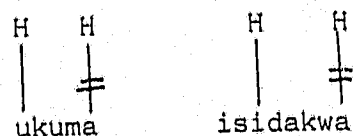
Extratonicity Marking



Rightward Shift

Removal of Extratonicity

Postlexical Component



Phrase Medial

Lowering

Low Tone Default

úkùma

isídàkwà

In (25), we have provided sample derivations for a verb and a noun in order to illustrate that Phrase Medial Lowering applies generally, and is not restricted to verbs.

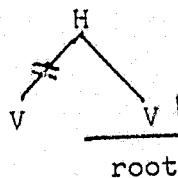
The [-stress] provision in the structural description of Phrase Medial Lowering is stipulated because on a stressed final syllable the high tone does not delink:

(26) únjěngaló babá "he is like this man"

The reason why Phrase Medial Lowering does not apply in this case has been provided in our discussion of the restrictions on the co-occurrence of prominence above.

The second post-lexical rule we need is termed Left Branch Delink.

(27) Left Branch Delink

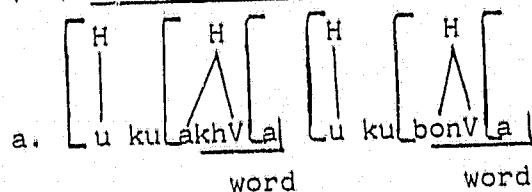


Condition: The root must occur phrase-medially or word-medially, i.e. with a suffix or in a compound.

This post-lexical rule delinks the left branch of a high tone co-linked to a penultimate and final vowel of a word in non-final position. In phrase final position, it will be recalled, it was the right branch that was delinked by the rule we called Phrase Final Lowering. Left Branch Delink actually removes tonal prominence from the penultimate syllable, but Phrase Medial Lowering resolves the imbalance by delinking the high tone now linked to the final vowel. This is the case, of course, when the root occurs phrase medially; when it occurs word-medially, however, the high tone on the final root syllable survives, unless it is moved by a different rule.

Let us commence by illustrating Left Branch Delink in its application to roots in phrase-medial position:

(28) Sample Derivations



H H
| ^
ukubona

Suffixation

Syllabification

Vowel/Glide Realization

Post-lexical Component

H H
| A
ukubona

Left Branch Delink

H H
| ≠
ukwakha
úkwàkhà

H H
| ≠
ukubona
úkùbònà

Phrase Medial Lowering

Low Tone Default

H H
| ^
amakho(si)

H H
| /
imiphongo(lo)

Lexical Component

Extratonicity Marking

H H
imiphongo(10)

Rightward Shift

$$\begin{array}{cc} \text{H} & \text{H} \\ | & \wedge \\ \text{amakhosi} & \end{array}$$

imiphongolo

Removal of Extraterritoriality

Post-lexical Component

H H
| A
amakhosi

imiphongolo

Left Branch Delink

H H
| |
| ≠
amakhosi
ámàkhòsì

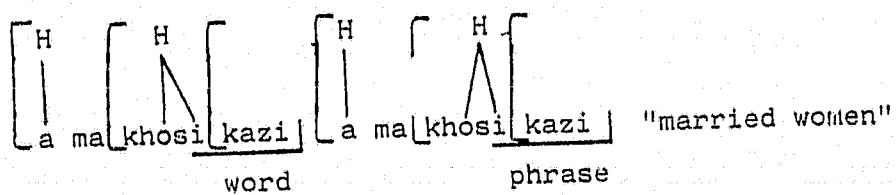
imiphongolo
imiphongòlò

Phrase Medial Lowering

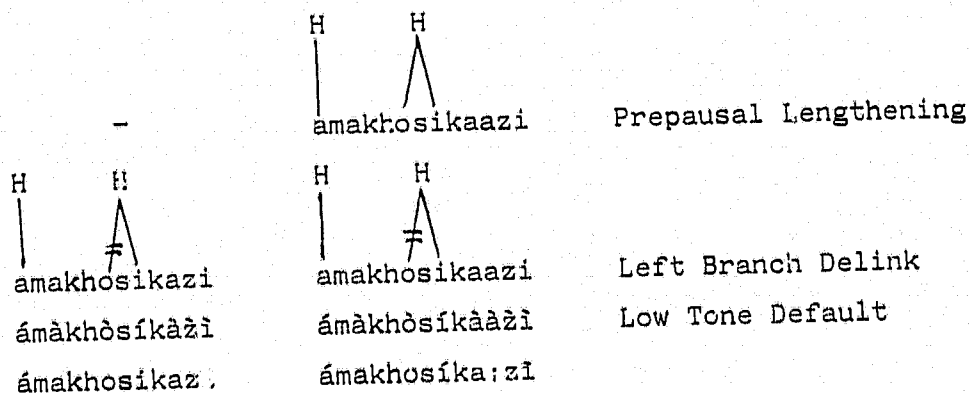
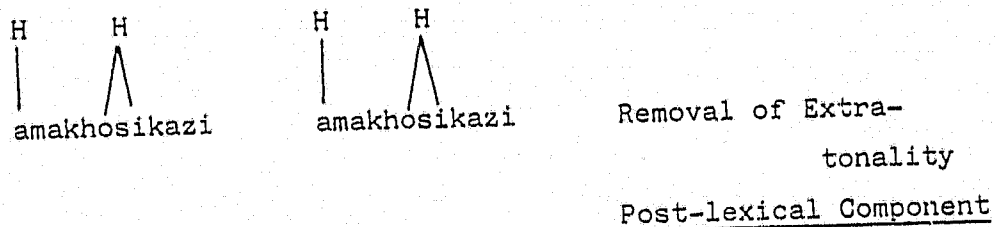
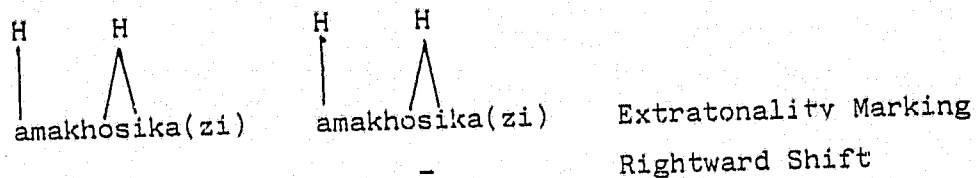
Low Tone Default

The 'word-medial' output of Left Branch Delink is not affected by the phrase position of the word incorporating it:

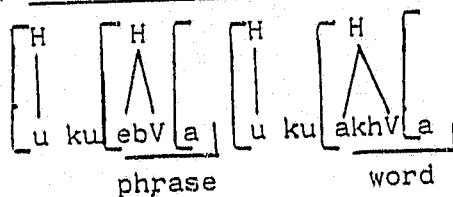
(29) Sample Derivations:



Lexical Component



It is to be noted that Left Branch Delink also accounts for dialectal variation. In the Natal Coast dialects, for instance, Left Branch Delink applies as a lexical rule to VCV radicals. (The Natal Coast dialects tend to dissolve high-low clusters wherever possible; recall that in the infinitive, Right Branch Delink applied to CVCV verbal radicals (see (15)).

(30) Sample Derivations - Natal Coast Dialects

úkuébá

úkuákhá

úkuébá

úkuákhá

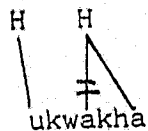
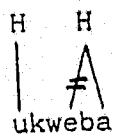
úkwébá

úkwákhá

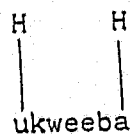
Lexical Component

Suffixation

Syllabification

Vowel/Glide Realiza-
tion

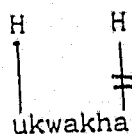
Left Branch Delink

Postlexical Component

-

Prepausal Lengthening

úkwèèbá



úkwàkhà

úkwe:bá

úkwakha

"To steal"

"To build"

Phrase Medial Lowering
Low Tone Default

In (30), we provided two sample derivations, one of the VCV verbal radical in phrase-final position, the second of another VCV verbal radical, but in phrase-medial position. The phrase-final form has a different phonetic form from that of the KwaZulu dialects which have /úkwè:ba/, but the phonetic form of the phrase-medial form is the same. The lexical application of Left Branch Delink manifests itself in the surface forms of phrase-final forms only.

To conclude this section, let us list the rules we have encountered so far:

(31) Rule SummaryLexical Rules

- a. Right Branch Delink
- b. Extratonicity Marking
- c. Rightward Shift
- d. Removal of Extratonicity

Default Rules

Low Tone Default

Postlexical Rules - Phrase-Final
Position

- a. Prepausal Lengthening
- b. High Dissimilation
- c. Phrase-Final Lowering

Postlexical Rules - Phrase-Medial
Position

- a. Left Branch Delink
- b. Phrase-Medial Lowering

2.1.3 Infinitives Incorporating Object Prefixes - (Positive
conjugation)

2.1.3.1 Phrase-Final Position

(32) Examples

- | | |
|---------------------|-----------------------|
| a. úkuyí:dlà## | "to eat it" |
| b. úkuyí:lwa## | "to fight it" |
| c. úkuyâ:kha## | "to build it" |
| d. úkulé:nzà## | "to make it" |
| e. ukúbahlé:ka## | "to laugh at them" |
| f. ukúbuphú:zà## | "to drink it" |
| g. ukúlifû:na## | "to want it" |
| h. ukúmesá:ba## | "to be afraid of him" |
| i. ukúsikhulú:ma## | "to speak it" |
| j. ukúbatháka:tna## | "to bewitch them" |

We need two more lexical rules to account for the forms in (32), and both these rules require some discussion. The first of these rules we term Leftward Lowering - a dissimilation rule that delinks the high tone of the leftmost of two adjacent 'toned' verbal morphemes. (Within the phonological component, the terms , 'tonally associated' and 'high toned' refer to a morpheme or tone-bearing unit which is associated with a high tone, while 'untuned', 'tonally unassociated' and 'low toned' refer to a morpheme or tone-bearing unit not associated with a high tone). This type of dissimilation is described in greater detail in Khumalo (1981) in terms of prominence: "If tonally

This is to be interpreted as stating that prefixes are lower than roots which are lower than suffixes." (Khumalo 1981: 60-1)

"We will call this rule Meeussen's Rule ...

$$\begin{array}{c} \text{V} \\ | \\ \text{H} \end{array} \quad \begin{array}{c} \text{V} \\ | \\ \textcircled{\text{H}} \end{array} \rightarrow \emptyset''$$

(Goldsmith et al (forthcoming): 9)

(33) Examples:

a. $\begin{array}{c} \text{[} \begin{array}{c} \text{[} \begin{array}{c} \text{[} \text{H} \end{array} \text{]} \text{]} \text{]} \\ \text{[} \text{a} \text{]} \text{[} \text{k} \text{]} \text{[} \text{a} \text{]} \text{[} \text{r} \text{]} \text{[} \text{V} \text{]} \text{[} \text{a} \text{]} \text{[} \text{n} \text{]} \text{[} \text{g} \text{]} \end{array} \text{]} \text{]} \text{]}^5$ + akafàngà "he did not die"

b. $\begin{bmatrix} \begin{bmatrix} \begin{bmatrix} \text{a} \end{bmatrix} \end{bmatrix} \begin{bmatrix} \begin{bmatrix} \text{k} \end{bmatrix} \end{bmatrix} \begin{bmatrix} \begin{bmatrix} \text{l} \end{bmatrix} \end{bmatrix} \begin{bmatrix} \begin{bmatrix} \text{w} \end{bmatrix} \end{bmatrix} \end{bmatrix} \begin{bmatrix} \begin{bmatrix} \text{a} \end{bmatrix} \end{bmatrix} \begin{bmatrix} \begin{bmatrix} \text{n} \end{bmatrix} \end{bmatrix} \begin{bmatrix} \begin{bmatrix} \text{g} \end{bmatrix} \end{bmatrix} \end{bmatrix}$ → aká'lwángà "he did not fight"

- c. $\left[\begin{array}{c} \left[\begin{array}{c} \text{H} \\ | \\ \text{a} \end{array} \right] \left[\begin{array}{c} \text{H} \\ | \\ \text{ka} \end{array} \right] \left[\begin{array}{c} \text{H} \\ | \\ \text{onV} \end{array} \right] \end{array} \right] \text{anga} \rightarrow \text{akonángã} \quad \text{"he did not sin"}$
- d. $\left[\begin{array}{c} \left[\begin{array}{c} \text{H} \\ | \\ \text{a} \end{array} \right] \left[\begin{array}{c} \text{H} \\ | \\ \text{ka} \end{array} \right] \left[\begin{array}{c} \text{H} \\ | \\ \text{ehlV} \end{array} \right] \end{array} \right] \text{anga} \rightarrow \text{aké}^{\text{h}} \text{hlángã} \quad \text{"he did not alight"}$
- e. $\left[\begin{array}{c} \left[\begin{array}{c} \text{H} \\ | \\ \text{a} \end{array} \right] \left[\begin{array}{c} \text{H} \\ | \\ \text{ka} \end{array} \right] \left[\begin{array}{c} \text{H} \\ | \\ \text{hlekV} \end{array} \right] \end{array} \right] \text{anga} \rightarrow \text{akáhlekángã} \quad \text{"he did not laugh"}$
- f. $\left[\begin{array}{c} \left[\begin{array}{c} \text{H} \\ | \\ \text{a} \end{array} \right] \left[\begin{array}{c} \text{H} \\ | \\ \text{ka} \end{array} \right] \left[\begin{array}{c} \text{H} \\ | \\ \text{hambV} \end{array} \right] \end{array} \right] \text{anga} \rightarrow \text{akahambángã} \quad \text{"he did not go"}$
- g. $\left[\begin{array}{c} \left[\begin{array}{c} \text{H} \\ | \\ \text{a} \end{array} \right] \left[\begin{array}{c} \text{H} \\ | \\ \text{ka} \end{array} \right] \left[\begin{array}{c} \text{H} \\ | \\ \text{bonV} \end{array} \right] \end{array} \right] \text{anga} \rightarrow \text{akabonángã} \quad \text{"he did not see"}$
- h. $\left[\begin{array}{c} \left[\begin{array}{c} \text{H} \\ | \\ \text{a} \end{array} \right] \left[\begin{array}{c} \text{H} \\ | \\ \text{ka} \end{array} \right] \left[\begin{array}{c} \text{H} \\ | \\ \text{esabV} \end{array} \right] \end{array} \right] \text{anga} \rightarrow \text{akesubángã} \quad \text{"he did not fear"}$
- i. $\left[\begin{array}{c} \left[\begin{array}{c} \text{H} \\ | \\ \text{a} \end{array} \right] \left[\begin{array}{c} \text{H} \\ | \\ \text{ka} \end{array} \right] \left[\begin{array}{c} \text{H} \\ | \\ \text{enabV} \end{array} \right] \end{array} \right] \text{anga} \rightarrow \text{akénabángã} \quad \text{"he did not stretch his legs"}$
- j. $\left[\begin{array}{c} \left[\begin{array}{c} \text{H} \\ | \\ \text{a} \end{array} \right] \left[\begin{array}{c} \text{H} \\ | \\ \text{ka} \end{array} \right] \left[\begin{array}{c} \text{H} \\ | \\ \text{khulumV} \end{array} \right] \end{array} \right] \text{anga} \rightarrow \text{akakhulumángã} \quad \text{"he did not speak"}$
- k. $\left[\begin{array}{c} \left[\begin{array}{c} \text{H} \\ | \\ \text{a} \end{array} \right] \left[\begin{array}{c} \text{H} \\ | \\ \text{ka} \end{array} \right] \left[\begin{array}{c} \text{H} \\ | \\ \text{hlakulV} \end{array} \right] \end{array} \right] \text{anga} \rightarrow \text{akáhlakulángã} \quad \text{"he did not weed"}$

The examples in (33) suggest that it is the rightmost high tone that survives in all such cases. Examples (33)(b), (d), (e), (i) and (k) demonstrate that the high tone on a morpheme surfaces when the adjacent morpheme is not also associated with a high tone. But when two adjacent morphemes are both high toned, then it is the high tone of the rightmost morpheme that survives, as examples (33)(a), (c), (f), (g), (h) and (j) illustrate. If, for the moment, we consider two examples only, viz. (33) (a) and (b), it seems reasonable to argue that the delinking of the high tone on /ka/ in (a) is conditioned by the high tone on the verbal radical /f/. After all, this is the only tonal difference between the two underlying forms.

Once we accept this argument, then we can extend it to account for the low tones on /ka/ in examples (33)(c), (f), (g), (h) and (j) (i.e. we claim that in each case the high tone associated with the prefix /ka/ has delinked in dissimilation to the high tone associated with the verbal radical).

Next we consider the examples where the high tone associated with the verbal radical has delinked. These are examples (33)(c), (f), (g), (h) and (j) (we are leaving out 33(a) because there is no evidence that the high tone associated with the verbal radical delinks). In these examples, also, it seems reasonable to assume that the high tone associated with each verbal radical has delinked in dissimilation to the high tone on the suffix /anga/. The following examples provide supporting evidence that a high toned suffix causes the high tone associated with the verbal radical to delink:

(34) Examples:

a. $\begin{array}{c} \text{H} \quad \text{H} \\ | \quad | \\ \text{[u]khulumV[ile]} \end{array} \rightarrow \text{úkhulúmile} \quad \text{"he spoke"}$

b. $\begin{array}{c} \quad \text{H} \\ \quad | \\ \text{[u]khulumV[ile]} \end{array} \rightarrow \text{ukhulúmile} \quad \text{"you spoke"}$

c. $\begin{array}{c} \boxed{H} \\ | \\ e \end{array} \begin{array}{c} H \\ | \\ khulumV \end{array} \begin{array}{c} \boxed{H} \\ / \backslash \\ ile \end{array} \rightarrow ekhulumfile \quad \text{"he spoke(participial)"}^6$

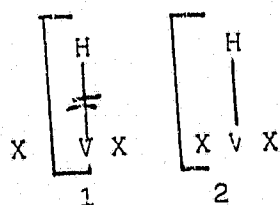
d. $\begin{array}{c} \boxed{H} \\ | \\ u \end{array} \begin{array}{c} H \\ | \\ khulumV \end{array} \begin{array}{c} \boxed{H} \\ / \backslash \\ ile \end{array} \rightarrow ukhulumfile \quad \text{"you spoke(participial)"}^6$

In (34)(a) and (b), the high tone associated with the verbal radical surfaces because, we claim, the suffix is low toned. In (34)(c) and (d), however, the verbal high tone delinks in dissimilation to the high tone associated with the suffix. (We shall see later in (100) that the prefixal high tone in (34)(a) surfaces because the indicative, principal subject prefix high tone is exempt from leftward lowering).

Our conclusion, therefore, is that in a similar way to what occurred in examples (34)(c) and (d), the verbal high tone in examples (33)(c), (f), (g), (h) and (j) delinks in dissimilation to the suffixal high tone. Our claim is that all such dissimilations apply in a left to right order, i.e. the high tone on /ka/ dissimilates from the high tone on the verbal radical, and thereafter the verbal high tone dissimilates from the high tone associated with the suffix /anga/. Such an analysis would account for all the surface forms in (33).

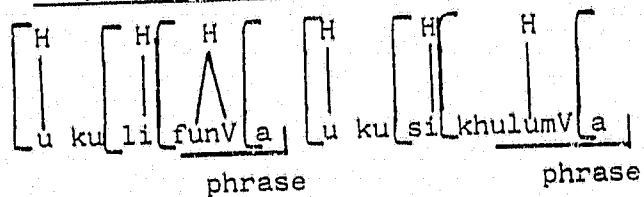
In the analysis employing Meeussen's Rule, we could also apply the rule in a left to right order and this would lower all the high toned verbal radicals, and then it would not apply to the suffix because of the intervening low toned morpheme. But then we would also need another rule to lower the high tone on /ka/ in just those cases where the verbal radical was originally high toned. Meeussen's Rule, does not embody the generalization underlying the facts in (33).

Let us now formalize Leftward Lowering - the rule that regulates tonal prominence in adjacent high toned verbal morphemes within the lexical component.

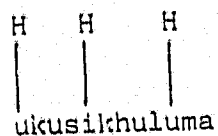
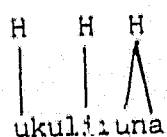
(35) Leftward Lowering

Condition: If 1 = SP or OP, then 2 = verbal radical
 If 1 = verbal radical, then 2 = verbal suffix.

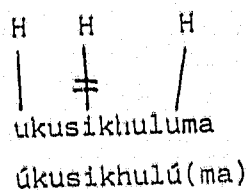
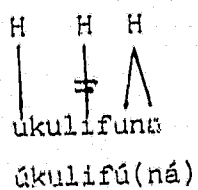
The rule states that of any two adjacent 'toned' morphemes of the type specified in the condition, the leftmost dissimilates (i.e. the high tone of the leftmost delinks).

(36) Sample Derivations

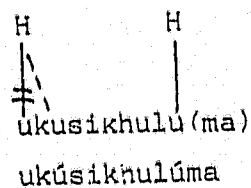
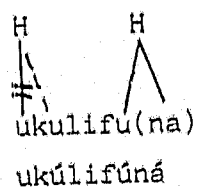
Lexical Component



Suffixation



Leftward Lowering
 Extratonicity Marking



Rightward Shift
 Removal of Extra-
 tonality

Postlexical Component

H H
| / \
ukulifuuna

H H
| / \
ukusikhuluuma

Prepausal Lengthening

H H
| / \
ukulifuuna

High Dissimilation

H H
| / \
ukulifuuna

Phrase Final Lowering

ùkúlifúûnâ

ùkúsikhûlúúmâ

Low Tone Default

ukúlifû:na

ukúsikhulú:ma

"to want it"

"to speak it"

In the sample derivation above, Leftward Lowering stands in a feeding relationship to Rightward Shift, i.e. if Leftward Lowering did not apply first and create the environment for Rightward Shift, the latter could not apply. This is the strongest evidence for their ordering relationship, viz. Leftward Lowering is ordered before Rightward Shift.

The second example also illustrates the failure of Rightward Shift to apply iteratively when the high tone is not the rightmost high tone in the word. This is a condition of Rightward Shift stated in (6), which we could not illustrate until now.

Before we discuss the next rule we need for deriving the forms in (32), we need to address a problem regarding the application of Rightward Shift. This problem concerns the derivation of example (32)(e), viz. /ukúbahlé:ka/. In this example, it would seem that the high tone associated with the object prefix /ba/ has shifted onto the verbal radical, which has triggered Rightward Shift from /u/ to /ku/. The problem with the shifting of the high tone from /ba/ to /hle/ is that, for purposes of Rightward Shift, Extratonicity Marking applies rendering the final syllable /ka/ 'invisible', thus not

providing the correct environment for the application of Rightward Shift. After the application of Extratonicity Marking the verb should be /úkubáhle(ka)/, which should not permit the high tone to shift from /ba/ to /hle/, and ,et it does.

does.

This, of course, could be the application of a different rule, but we think that it is Rightward Shift that applies here. There is some regularity about tonally unassociated (i.e. low-toned) CVCV verbal radicals which is clearly eluding us. This is not the only area where tonally unassociated CVCV verbal radicals behave exceptionally. In the negative of the infinitive, for example, these radicals behave exceptionally in blocking the application of Leftward Spread (see (58)). In the positive subjunctive incorporating object prefix these radicals again block the application of Leftward Spread. In the imperative construction, they are the only polysyllabic verbal radicals that associate the floating high tone of the imperative morpheme with the final syllable, all other polysyllabic stems associate it with the penultimate syllable:

(37) Examples:

- a. $\begin{bmatrix} \text{hlekV} \\ \text{a} \end{bmatrix} \begin{bmatrix} \text{H (imp.)} \end{bmatrix} \rightarrow \text{hleká} \quad \text{"laugh (imp.)"}$
- b. $\begin{bmatrix} \text{H} \\ | \\ \text{hambV} \\ \text{a} \end{bmatrix} \begin{bmatrix} \text{H (imp.)} \end{bmatrix} \rightarrow \text{hámǎ} \quad \text{"go (imp.)"}$
- c. $\begin{bmatrix} \text{phuthumV} \\ \text{a} \end{bmatrix} \begin{bmatrix} \text{H (imp.)} \end{bmatrix} \rightarrow \text{phuthúma} \quad \text{"hurry (imp.)"}$
- d. $\begin{bmatrix} \text{H} \\ | \\ \text{sebenzV} \\ \text{a} \end{bmatrix} \begin{bmatrix} \text{H (imp.)} \end{bmatrix} \rightarrow \text{sebénzǎ} \quad \text{"work (imp.)"}$

- e. $\left[\begin{array}{c} \text{H} \\ | \\ \text{hlabelelV} \end{array} \right] \left[\begin{array}{c} \text{a} \end{array} \right] \xrightarrow{(\text{H imp.})} \text{hlabeléla} \quad \text{"sing (imp.)"}$

In the example /ukúbahléka/ we believe that Rightward Shift has applied and that the tonally unassociated CVCV verbal radical /hlek/ behaves exceptionally with regard to Extratonicity Marking. This exceptional behaviour is restricted to environments where the verbal radical is immediately preceded either by the subject or object prefix, as the following examples illustrate:

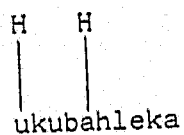
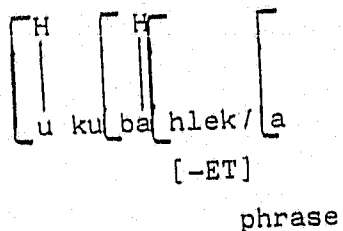
(38)

- a. $\left[\begin{array}{c} \text{H} \\ | \\ \text{u} \end{array} \right] \left[\begin{array}{c} \text{ku} \end{array} \right] \left[\begin{array}{c} \text{hlekV} \end{array} \right] \left[\begin{array}{c} \text{a} \end{array} \right] \rightarrow \text{ukúhleka} \quad \text{"to laugh"}$
- b. $\left[\begin{array}{c} \text{H} \\ | \\ \text{u} \end{array} \right] \left[\begin{array}{c} \text{ya} \end{array} \right] \left[\begin{array}{c} \text{hlekV} \end{array} \right] \left[\begin{array}{c} \text{a} \end{array} \right] \rightarrow \text{uyáhleka} \quad \text{"he laughs"}$
- c. $\left[\begin{array}{c} \text{a} \end{array} \right] \left[\begin{array}{c} \text{nga} \end{array} \right] \left[\begin{array}{c} \text{H} \\ | \\ \text{dakwV} \end{array} \right] \left[\begin{array}{c} \text{a} \end{array} \right] \rightarrow \text{angádàkwa} \quad \text{"he may get drunk"}$
- d. $\left[\begin{array}{c} \text{H} \\ | \\ \text{uma} \end{array} \right] \left[\begin{array}{c} \text{H} \\ | \\ \text{e} \end{array} \right] \left[\begin{array}{c} \text{hlekV} \end{array} \right] \left[\begin{array}{c} \text{a} \end{array} \right] \rightarrow \text{úma ehléka} \quad \text{"if he laughs"}$
- e. $\left[\begin{array}{c} \text{H} \\ | \\ \text{uma} \end{array} \right] \left[\begin{array}{c} \text{H} \\ | \\ \text{e} \end{array} \right] \left[\begin{array}{c} \text{H} \\ | \\ \text{ba} \end{array} \right] \left[\begin{array}{c} \text{hlekV} \end{array} \right] \left[\begin{array}{c} \text{a} \end{array} \right] \rightarrow \text{úma ébahléka} \quad \text{"If he laughs at them"}$

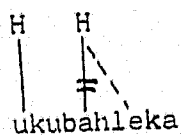
In examples (38)(d) and (e), the high tone on the subject prefix and object prefix respectively shifts onto the verbal

radical, while in examples (38) (a) and (b), the high tone shifts only to the antepenultimate syllable indicating that the final syllable is 'invisible' to the rule. In (c) also the high tone does not shift onto the radical. The behaviour of these radicals in this instance is not exceptional when viewed in terms of the notion of the dominance hierarchy. It would be expected that tonal prominence would shift from a lower ranking to a higher ranking morpheme. The argument would be that the high tone does not shift from /ku/, /ya/ and /nga/ in (a), (b) and (c) respectively because these morphemes are neither SP nor OP, therefore they are not affected by the dominance hierarchy. The complication, however, arises in that the OP high tone shifts onto the penultimate syllable in CVCV verbal radicals but onto the antepenultimate syllable in longer verbal radicals such as the one in example (32)(j). In the latter example Extratonicity Marking applies. We have indicated this exceptional behaviour of tonally unassociated CVCV radicals in terms of the exceptional non-application of Extratonicity Marking in this environment. We wish to state again that we can provide no explanation for this exceptional behaviour of tonally unassociated CVCV radicals.

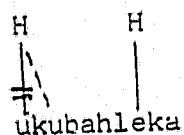
However, this exceptional behaviour can be expressed in the form of an ad hoc condition on Extratonicity Marking. In the section immediately preceding (8) Extratonicity Marking was expressed in the form of a statement: "Mark the final syllable of a multi-syllabic stem as 'extratonic'". This statement has now to be modified as follows: "Mark the final syllable of a multi-syllabic stem (excepting a tonally unassociated CVCV stem immediately preceded by SP or OP) as 'extratonic'". Wherever a CVCV stem is immediately preceded by SP or OP, we will mark it [-ET] to remind the reader of this condition.

(39) Sample Derivation

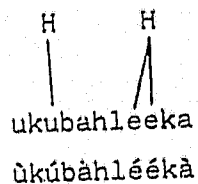
Suffixation



Rightward Shift



Rightward Shift

Postlexical Component

Prepositional Lengthening

Low Tone Default

The next rule that we need is one that shifts a high tone leftwards from the rightmost morpheme. To the best of our knowledge, such a rule has never been postulated in Zulu tonology. We call this rule Leftward Spread. In order to get a better understanding of this rule, let us consider for a while the types of monosyllabic tense suffixes that occur in Zulu. As might be expected, there are two types of such affixes viz. tonally unassociated and tonally associated. The first type presents no problems - it is the latter type that presents some complexities. There would seem to be three types of tonally associated monosyllabic suffixes:

- a. those that undergo the rule we call Leftward Spread,
- b. those that undergo a different rule, which we will call Leftward Shift, and
- c. one that neither undergoes Leftward Spread nor Leftward Shift and that is the subjunctive /-e^H/, when the verb occurs without the object prefix.

(40) Examples:

- a. ukúze` báha:mbé## "so that they go"
- b. ukúze` bábo:né## "so that they see"
- c. ukúze` basébe:nzé## "so that they work"
- d. ukúze` bahláku:lé## "so that they weed"

In these examples in (40), the high tone associated with the subjunctive suffix /e^H/ surfaces in the suffix syllable. The suffixes /-i^H/, /-e^H/ and /-a^H/ of the indicative principle present, the conditional present and the subjunctive past negative tenses respectively, all undergo Leftward Shift. These suffixes will be marked [+LSH]

(41) Examples:

- a. $\left[\begin{array}{c} \text{H} \\ \left[\text{a} \left[\text{ka} \right] \text{hlakulV} \left[\text{i} \right] \right] \end{array} \right] \text{ [+LSH]} \rightarrow \text{akáhlakúli}$ "he doesn't weed"
phrase
- b. $\left[\begin{array}{c} \text{H} \\ \left[\text{ba} \right] \text{ngée} \text{hlakulV} \left[\text{e} \right] \right] \text{ [+LSH]} \rightarrow \text{bangé:hlakúle}$ "they wouldn't weed"
phrase
- c. $\left[\begin{array}{c} \text{H} \text{ H} \\ \left[\text{a} \left[\text{si} \right] \text{aa} \right] \text{hlakulV} \left[\text{a} \right] \right] \text{ [+LSH]} \rightarrow \text{asâ:hlakúla}$ "and we didn't weed"
phrase

In these examples in (41), the high tone associated with the suffix shifts one to the left. The suffixes that undergo Leftward Spread, however, are in the great majority, and these will be discussed in a later section. Here we will only use three such suffixes in our examples, viz. the $\begin{smallmatrix} H \\ -i/ \end{smallmatrix}$ of the indicative, participial present negative, the $\begin{smallmatrix} H \\ -a/ \end{smallmatrix}$ of the remote past positive, and $\begin{smallmatrix} H \\ -a/ \end{smallmatrix}$ of the indicative present "passive" negative. These suffixes are marked [+LSp].

(42) Examples:

a. $\begin{bmatrix} H \\ | \\ e \end{bmatrix} \begin{bmatrix} \\ | \\ \text{nga} \end{bmatrix} \begin{bmatrix} \\ | \\ \text{hlakulV} \end{bmatrix} \begin{bmatrix} H \\ | \\ i \end{bmatrix} + [\text{LSp}] \rightarrow \text{éngáhlakû:li}$ "(he) not weeding"
phrase

b. $\begin{bmatrix} H & H \\ | & | \\ u & aa \end{bmatrix} \begin{bmatrix} \\ | \\ \text{hlakulV} \end{bmatrix} \begin{bmatrix} H \\ | \\ a \end{bmatrix} + [\text{LSp}] \rightarrow \text{wâ:hlakû:la}$ "he weeded"
phrase

c. $\begin{bmatrix} \\ | \\ a \end{bmatrix} \begin{bmatrix} H \\ | \\ yi \end{bmatrix} \begin{bmatrix} \\ | \\ \text{hlakulV} \end{bmatrix} \begin{bmatrix} \\ | \\ iw \end{bmatrix} \begin{bmatrix} H \\ | \\ a \end{bmatrix} + [\text{LSp}] \rightarrow \text{ayíhlakû:lwa}$ "it is not weeded"
phrase

To sum up, we claim that in the examples in (40), the high tone on the suffix remains there, whereas in the examples in (41), it spreads leftwards to the penultimate syllable and delinks from the final vowel, while in the examples in (42), it spreads like it does in (41), but unlike the examples in (41), it does not delink from the final vowel. The rule that applies in (41), we term Leftward Shift while that applying in (42) is termed Leftward Spread.

In some environments, the high tone associated with a monosyllabic verbal radical spreads leftwards onto the vowel of the subject or object prefix. This spread follows the application of Leftward Lowering:

(43) Examples:

a. $\begin{array}{|c|c|c|} \hline H & H & H \\ \hline \end{array}$
 $\begin{array}{|c|c|c|} \hline \text{uma} & \text{e} & \text{dlv} & \text{a} \\ \hline \end{array} \rightarrow \text{úma é:dlà} \quad \text{"If he eats"}$
word phrase

b. $\begin{array}{|c|c|c|c|} \hline H & H & H & H \\ \hline \end{array}$
 $\begin{array}{|c|c|c|c|} \hline \text{uma} & \text{e} & \text{yi} & \text{dlv} & \text{a} \\ \hline \end{array} \rightarrow \text{úma é'yí:dlà} \quad \text{"If he eats it"}$
word phrase

c. $\begin{array}{|c|c|c|c|} \hline H & H & H & H \\ \hline \end{array}$
 $\begin{array}{|c|c|c|c|} \hline \text{u} & \text{ku} & \text{yi} & \text{dlv} & \text{a} \\ \hline \end{array} \rightarrow \text{úkuyí:dlà} \quad \text{"To eat it"}$
phrase

In the examples above, we claim that after Leftward Lowering has applied, the high tone on the monosyllabic verbal radical spreads onto the SP/OP, and the co-linked high tone surfaces as the high-low tone cluster after the application of the relevant postlexical rules.

(44) Examples

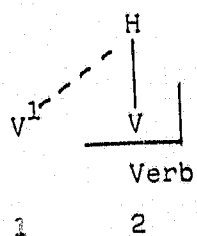
a. $\begin{array}{|c|c|c|c|} \hline H & H & H & H \\ \hline \end{array}$
 $\begin{array}{|c|c|c|c|} \hline \text{uma} & \text{e} & \text{nga} & \text{yi} & \text{lwV} & \text{i} \\ \hline \end{array} [+LSp] \rightarrow \text{úma éngâyí:lwí} \quad \text{"If he doesn't fight it"}$
word phrase

b. $\begin{array}{|c|c|c|c|} \hline H & H & H & H \\ \hline \end{array}$
 $\begin{array}{|c|c|c|c|} \hline \text{uma} & \text{e} & \text{nga} & \text{mu} & \text{phV} & \text{i} \\ \hline \end{array} [+LSp] \rightarrow \text{úma éngâmû:phí} \quad \text{"If he doesn't give him"}$
word phrase

In the examples in (44), there is no evidence of the application of Leftward Spread in example (b). We claim that it does apply in this example, but, as we discuss in a separate article⁷, its application is obscured by the exceptional application of Tone Simplification to the high tone associated

with the negative suffix. However, we will not repeat the arguments in that article, as they have no bearing on the present discussion. The examples in (43), we believe, clearly point to the leftward spread of the high tone associated with the monosyllabic verbal radical, while those in (42) point to the leftward spread of a negative suffix high tone.

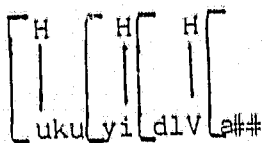
(45) Leftward Spread



Condition: If 1 = SP/OP vowel then 2 = monosyllabic verb vowel.
 If 1 = polysyllabic verb vowel then 2 = [+LSp] suffix.

In this lexical rule, a high tone on a monosyllabic verb spreads leftwards onto the SP|OP vowel or the high tone on a monosyllabic [+LSp] suffix vowel spreads leftwards onto the vowel of a polysyllabic verb. Leftward Spread and Leftward Shift, which we will consider in (126) are lexical rules that apply in the verbal construction only. The motivation for these two rules is again penultimate syllable prominence. It is worth noting that the dominance hierarchy and penultimate syllable prominence are not mutually exclusive. Leftward Lowering, which is a dominance hierarchy rule, applies before and is in a feeding relationship with Leftward Spread and Leftward Shift, which are penultimate syllable prominence rules.

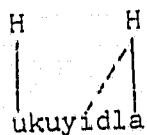
(46) Sample Derivation



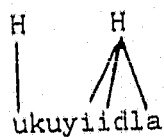
H H H
 | | |
 ukuyidla

Lexical Component

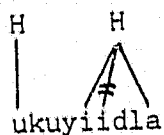
Leftward Lowering



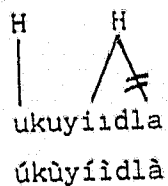
Leftward Spread
Post-lexical Component



Prepausal Lengthening



High Dissimilation



Phrase Final Lowering
Low Tone Default

This finally brings us to the end of our discussion of infinitives incorporating object prefixes and occurring in phrase final position.

2.1.3.2 Phrase Medial Position

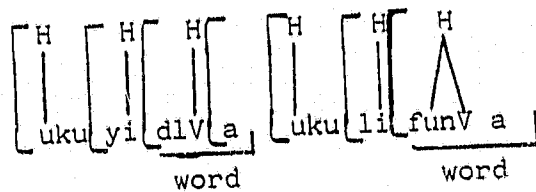
Here are positive infinitives incorporating object prefixes, now occurring in phrase medial position:

(47) Examples:

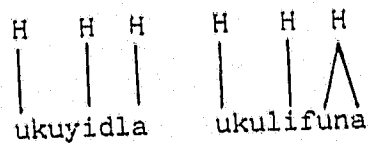
- | | | |
|----|----------------|--------------------|
| a. | úkuyidlâ# | "to eat it" |
| b. | úkuyilwa# | "to fight it" |
| c. | úkuyakha# | "to build it" |
| d. | úkulénzâ# | "to make it" |
| e. | ukúbahléka# | "to laugh at them" |
| f. | ukúbuphúzá# | "to drink it" |
| g. | ukúlifuna# | "to want it" |
| h. | ukúmesába# | "to fear him" |
| i. | úkuléluka# | "to knit it" |
| j. | ukúsikhulúma# | "to speak it" |
| k. | ukúbathákatha# | "to bewitch them" |

There are no new rules required for the derivation of the infinitives above.

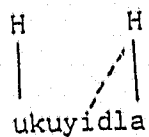
(48) Sample Derivations



Lexical Component



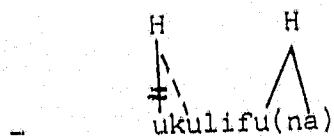
Leftward Lowering



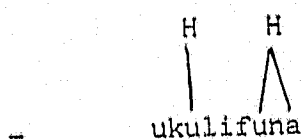
Leftward Spread

- úkulifú(ná)

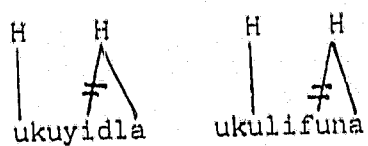
Extratonicity Marking



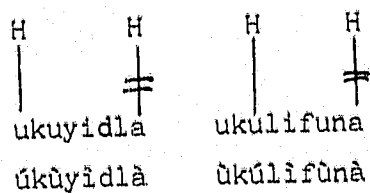
Rightward Shift



Removal of Extratonicity
Post-lexical Component



Left Branch Delink



Phrase Medial Lowering
Low Tone Default

The sample derivations in (48) provide some evidence on rule ordering in the lexical component. Clearly, Leftward Lowering must precede Leftward Spread since the former feeds the latter, as is illustrated in the derivation of /ukuyidla/. Leftward Spread must precede Rightward Shift. In the derivation of /ukuyidla/ Leftward Spread applies first and bleeds Rightward Shift. If Rightward Shift applied first, both would apply resulting in the wrong form /*ukú'yí:dla/.

Here is the list of the rules we have met so far:

(49) Rule Summary

a. Lexical Component

- | | |
|-------------------------|------------------------------|
| i. Right Branch De'link | iv. Extratona'ity Marking |
| ii. Leftward Lowering | v. Rightward Shift |
| iii. Leftward Spread | vi. Removal of Extratona'ity |

b. Post-lexical Component

Phrase Final Position

- | | |
|----------------------------|------------------------|
| i. Prepausal Lengthening | ii. High Dissimilation |
| iii. Phrase Final Lowering | |

Phrase Medial Position

- | | |
|-----------------------|----------------------------|
| i. Left Branch Delink | ii. Phrase Medial Lowering |
|-----------------------|----------------------------|

c. Phonetic Rules

- i. Low Tone Default

2.1.4 Negative Infinitives

2.1.4.1 Negative Infinitives without Object Prefixes

(50) Examples:

a. i. ukúngâ:fí## "not to die"

ii. ukúngâfí #

$$\begin{array}{c} \boxed{H} \quad \boxed{H} \quad \boxed{H} \\ | \quad | \quad | \\ u \quad ku \quad nga \quad [fV] \quad i \quad [+LSp] \end{array}$$

b. i. ukúngâlwi## "not to fight"

ii. ukúngâlwi#

$$\begin{array}{c} \boxed{H} \quad \boxed{H} \quad \boxed{H} \\ | \quad | \quad | \\ u \quad ku \quad nga \quad [lWV] \quad i \quad [+LSp] \end{array}$$

- c. i. ukúngô:ni## "not to spoil" $\begin{bmatrix} H \\ | \\ u \end{bmatrix} \begin{bmatrix} H \\ | \\ ku \end{bmatrix} \begin{bmatrix} H & H \\ \wedge & | \\ onV & i \end{bmatrix} [+LSp]$
- ii. ukúngóní# "
- d. i. ukúngô:sí## "not to roast" $\begin{bmatrix} H \\ | \\ u \end{bmatrix} \begin{bmatrix} H \\ | \\ ku \end{bmatrix} \begin{bmatrix} H \\ | \\ nga \end{bmatrix} \begin{bmatrix} H \\ | \\ osV & i \end{bmatrix} [+LSp]$
- ii. ukúngôsí# "
- e. i. ukúngàhle:ki## "not to laugh" $\begin{bmatrix} H \\ | \\ u \end{bmatrix} \begin{bmatrix} H \\ | \\ ku \end{bmatrix} \begin{bmatrix} H \\ | \\ nga \end{bmatrix} \begin{bmatrix} H \\ | \\ hlekV & i \end{bmatrix} [+LSp]$
- ii. ukúngàhleki# "
- f. i. ukúngàphû:zi## "not to drink" $\begin{bmatrix} H \\ | \\ u \end{bmatrix} \begin{bmatrix} H \\ | \\ ku \end{bmatrix} \begin{bmatrix} H \\ | \\ nga \end{bmatrix} \begin{bmatrix} H \\ | \\ phuzV & i \end{bmatrix} [+LSp]$
- ii. ukúngàphuzi# "
- g. i. ukúngàbô:ni## "not to see" $\begin{bmatrix} H \\ | \\ u \end{bmatrix} \begin{bmatrix} H \\ | \\ ku \end{bmatrix} \begin{bmatrix} H & H \\ \wedge & | \\ bonV & i \end{bmatrix} [+LSp]$
- ii. ukúngàboni# "
- h. i. ukúngèsâ:bi## "not to be afraid" $\begin{bmatrix} H \\ | \\ u \end{bmatrix} \begin{bmatrix} H \\ | \\ ku \end{bmatrix} \begin{bmatrix} H \\ | \\ nga \end{bmatrix} \begin{bmatrix} H \\ | \\ esabV & i \end{bmatrix} [+LSp]$
- ii. ukúngèsabi# "
- i. i. ukúngènabí## "not to stretch out" $\begin{bmatrix} H \\ | \\ u \end{bmatrix} \begin{bmatrix} H \\ | \\ ku \end{bmatrix} \begin{bmatrix} H \\ | \\ nga \end{bmatrix} \begin{bmatrix} H \\ | \\ enabV & i \end{bmatrix} [+LSp]$
- ii. ukúngènabi# "
- j. i. ukúngàkhulû:m## "not to talk" $\begin{bmatrix} H \\ | \\ u \end{bmatrix} \begin{bmatrix} H \\ | \\ ku \end{bmatrix} \begin{bmatrix} H \\ | \\ nga \end{bmatrix} \begin{bmatrix} H \\ | \\ khulumV & i \end{bmatrix} [+LSp]$
- ii. ukúngàkhulum:## "
- k. i. ukúngàhlakû:l## "not to weed" $\begin{bmatrix} H \\ | \\ u \end{bmatrix} \begin{bmatrix} H \\ | \\ ku \end{bmatrix} \begin{bmatrix} H \\ | \\ nga \end{bmatrix} \begin{bmatrix} H \\ | \\ hlakulV & i \end{bmatrix} [+LSp]$
- ii. ukúngàhlakuli# "

One look at the examples in (50) is sufficient to indicate that the negative suffix /-i/ in this construction, is a suffix that undergoes Leftward Spread (see our discussion covering (43) to (46)). In derivations, therefore, this suffix will be specified /^Hi[+LSp]/.

Before considering these examples in detail, let us pay some attention to the morphological structure of verbs. In terms of their morphological structure, verbs may be divided into two types: those that consist of a root and affixes, and those that derive from two verbal complexes - the first a deficient verb root and its affixes, and a complement verb root and its affixes:

(51) Examples:

- a. $\left[\begin{array}{c} \left[\begin{array}{c} H \\ | \\ ma \end{array} \right] \left[\begin{array}{c} H \\ | \\ ka \end{array} \right] \left[\begin{array}{c} H \\ | \\ yi \end{array} \right] \left[\begin{array}{c} \\ | \\ \text{gezV} \end{array} \right] \left[\begin{array}{c} H \\ | \\ e \end{array} \right] \end{array} \right]$ $maká'yigè:zě$ "let him wash it"
root
- b. $\left[\begin{array}{c} \left[\begin{array}{c} H \\ | \\ u \end{array} \right] \left[\begin{array}{c} H \\ | \\ be \end{array} \right] \left[\begin{array}{c} H \\ \wedge \\ \text{thandV} \end{array} \right] \left[\begin{array}{c} \\ | \\ a \end{array} \right] \end{array} \right]$ $ubethâ:ndâ$ "he wanted to"
root root

In (a) above, /ma/, /ka/ and /yi/ are prefixes, but in (b) /be/ is a deficient verb with its own subject prefix, and it conditions a complement in the participial submood, i.e. the complement verb root /thand/ whose tonal pattern⁸ and subject prefix⁹ indicate that the verb is in the indicative participial submood. The phonetic 'prefixes' that condition complements are /be/, and those illustrated in (52):

(52)

- a.

H	H	H	H
u	se	e	hambV

 a
- use¹hambà
- "he is already leaving"
- root root

- b. [H] [] []
[u zo] [ku yV] a → úzôya/úzòkuya "he will go"
root root
- c. [H] [H] [H] [H]
[a be e se e hambV] a → abésehámba "and then he leaves"
root root root
- d. [H] [] []
[ba yo] [ku sho] → báyosho/báyokusho "they will tell"
root root
- e. [H] [H] []
[ba] [boo] [ku sho] → babô:sho/babô:kusho "They should tell"
root root

In other words, the phonetic 'prefixes' that clearly condition complements in Zulu are the following:

(53)

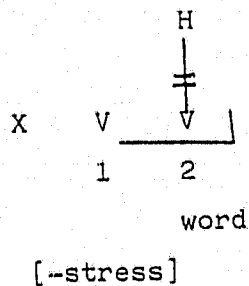
- | | | |
|----|---------------------|-----------------------|
| a. | /be/ | past tense marker |
| b. | /se ^H / | "already" |
| c. | /se/ | "and then" |
| d. | /zo/ | future (immediate) |
| e. | /yo/ | future (remote) |
| f. | /bo ^H o/ | exhortative (see 6.1) |

These are the only prefixes which we will treat as underlying deficient verbs. An attempt to bring tonal evidence to bear on this issue (see Khumalo 1982: 35-39) has proved inconclusive, and it has been abandoned. Further research is bound to shed a better light on this complex issue.

To return to the examples in (50), first of all we wish to focus on the negative prefix /nga/. There is something about

the tonological behaviour of this prefix that we cannot explain, viz. a phonological rule delinking a high tone fails to apply to a monosyllabic morpheme immediately preceded by the negative prefix /nga/. In examples (50) (a)(ii), (b)(ii), (c)(ii) and (d)(ii) we notice that Phrase Medial Lowering fails to apply to the syllables immediately succeeding /nga/. Presently, in (60) we will again notice /nga/ blocking the application of Leftward Lowering to object prefixes to its immediate right. Let us include this tonological effect of /nga/ in the structural description of Phrase Medial Lowering.

(54) Phrase Medial Lowering

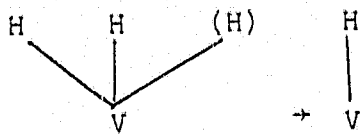


Condition: Vowel 1 must not be part of the syllable of the negative prefix /nga/.

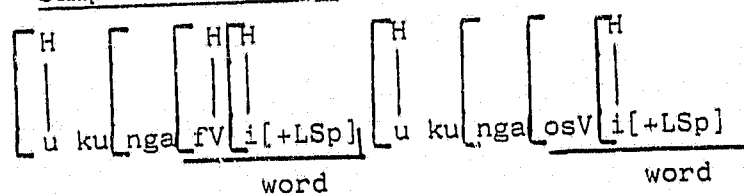
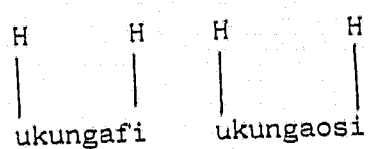
But for the addition of this condition, the rule in (54) is the same as the rule presented in (24).

Before supplying a few sample derivations, let us formalize a tone simplification rule we hinted at in our discussion of example (44)(b):

(55) Tone Simplification



This is a type of Wellformedness Condition which states that if a single tone-bearing unit is associated with more than one high tone, the high tones are reduced to one high tone. This rule, affecting high tones only, applies in the lexical and postlexical components.

(56) Sample DerivationsLexical Component

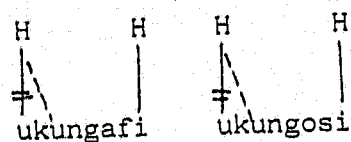
Suffixation and Tone

Simplification

Syllabification

Vowel Deletion

— úkungaosí
— úkungosí



Rightward Shift

Postlexical Component

Low Tone Default

úkúngàfí úkúngòsí
ukúngàfí ukúngòsí

"not to die" "not to roast"

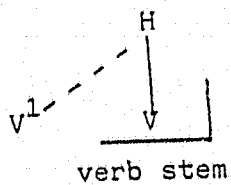
In the sample derivations above, it is the negative prefix /nga/, we claim, that blocks the application of Phrase Medial Lowering.

Another matter that merits a discussion in the examples in (50) is the failure of Leftward Spread to apply to the tonally unassociated CVCV and VCVCV verbal radicals in examples (50) (e)(i) and (i)(i). The forms should surface as /*ukúngahlê:ki/ and /*ukúngenâ:bi/ instead of /ukúngahlekí/ and /ukúngenabí/ respectively, if Leftward Spread had applied to them.

But Leftward Spread has not applied, and we ascribe this to the exceptional behaviour of CVCV verbal radicals, which we hinted at, in the discussion that led to sample derivation (39). We also wish to point out that many Zulu speakers carry the wrong forms represented by /*ukúngahlê:ki/ and

/*ukúngenâ:bi/ late into their teens, which confirms the exceptional nature of the correct forms. In other words, in their speech, they apply Leftward Spread regularly, and learn much later of the exceptional behaviour of these verbal radicals. Let us include the exceptional behaviour of the verbs into the structural description of the rule:

(57) Leftward Spread

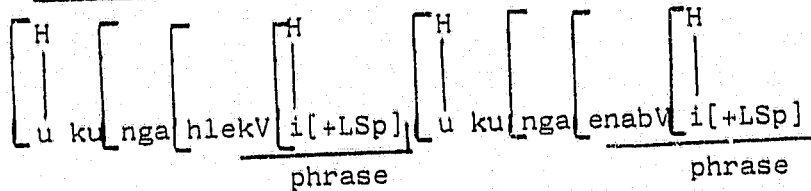


1 2

Condition: If 1 = SP/OP vowel, then 2 = Terminating monosyllabic verb stem vowel.

If 1 = polysyllabic verb vowel (other than that of tonally unassociated CVCV or VCVCV verb), then 2 = [+LSp] suffix vowel.

(58) Sample Derivations



úkungahlekí

úkungaenabí

Lexical Component

Suffixation and

Syllabification

Vowel Deletion

Extratonicity Marking

úkungahle(kí)

úkungena(bí)

úkungahle(kí)

úkungena(bí)

Rightward Shift

Removal of Extratonicity

Postlexical Component

Prepausal Lengthening

Low Tone Default

úkúngahleekí

úkúngenaabí

úkúngâhlèèkí

úkúngênââbí

It is worth noting that Rightward Shift does not apply iteratively in the sample derivations above because, as we stated in (6), it is only the rightmost high tone in the word that shifts iteratively. The discussion and sample derivations above have accounted for examples (50)(a), (b), (d), (e) and (i). In all other examples Leftward Spread applies without exception.

2.1.4.2 Negative Infinitives Incorporating Object Prefixes

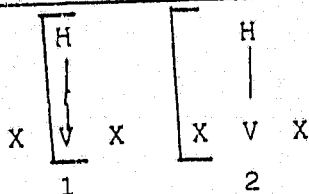
(59) Examples:

- | | | | |
|----|------|--------------------------------|------------------------|
| a. | (i) | ukúngâmû:phí## | "Not to give him" |
| | (ii) | ukúngâmúphi# | " " |
| b. | (i) | ukúngâyí:lwí## | "Not to fight it" |
| | (ii) | ukúngâyílwí# | " " |
| c. | (i) | ukúngâyô:ni## | "Not to spoil it" |
| | (ii) | ukúngâyoni# | " " |
| d. | (i) | ukúngâyô:sí## | "Not to roast it" |
| | (ii) | ukúngâyósi# | " " |
| e. | (i) | ukúngábáhle:kí## | "Not to laugh at them" |
| | (ii) | ukúngábáhleki# | " " |
| f. | (i) | ukúngábú ¹ phû:zi## | "Not to drink it" |
| | (ii) | ukúngábúphuzi# | " " |
| g. | (i) | ukúngábá ¹ bô:ni## | "Not to see them" |
| | (ii) | ukúngábáboni# | " " |
| h. | (i) | ukúngâyé ¹ sâ:bi## | "Not to fear it" |
| | (ii) | ukúngâyésabi# | " " |
| i. | (i) | ukúngâyélu:kí## | "Not to knit it" |
| | (ii) | ukúngâyéluki# | " " |
| j. | (i) | ukúngásíkhulû:mi## | "Not to speak it" |
| | (ii) | ukúngásíkhulumi# | " " |
| k. | (i) | ukúngâyíhlakû:li## | "Not to weed it" |
| | (ii) | ukúngâyíhlakuli# | " " |

We have the rules that apply to the infinitives in (59) above; the only problem is that Leftward Lowering does not seem to apply as expected to the object prefixes of all high toned

verbal prefixes, e.g. we would expect (59) (j)(i) to surface as /ukúngasikhulû:mi/, with the high tone associated with the object prefix /si/ dissimilating to the high tone of the verbal radical. Leftward Lowering just does not apply to an object prefix which occurs immediately after negative prefix /nga/. We do not know how to express this tonological restriction except as an extra condition on the application of Leftward lowering, which will not be formalized as follows:

(60) Leftward Lowering



- Conditions: 1. If 1 = SO/OP, then 2 = verbal radical.
 If 1 = verbal radical, then 2 = verbal suffix.
 2. The rule does not apply to the object prefix immediately preceded by the negative prefix /nga/.

This "/nga/ negative" condition we consider exceptional, like the /nga/ condition in the Phrase Medial Lowering rule formulated in (54), because both pronunciations tend to be mastered late, and some adult speakers in areas where Zulu is not the redominant language do not acquire these pronunciations. It is quite common to hear teenagers and urban Zulus use the following pronunciations:

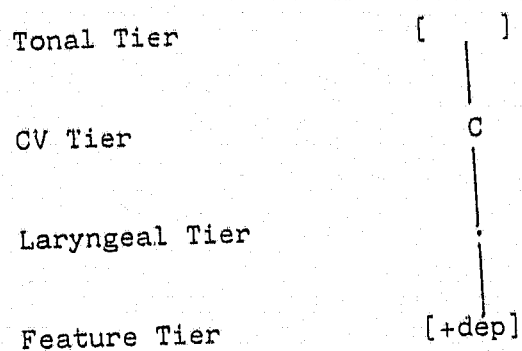
(61)

- a. ukúngābuphû:zi##
- b. ukúngābabô:ni##
- c. ukúngāsikhulû mi##
- d. ukúngābuhlê:ki##

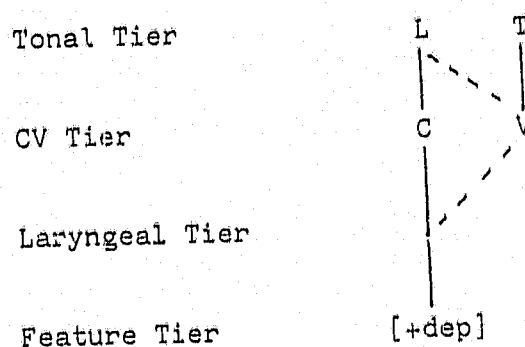
The list of tonal rules we have thus far encountered is the same as that presented in (49), except for the addition of the Wellformedness Condition we called Tone Simplification.

3. Depressor Shift

Before considering the next construction, we wish to introduce the phonetic tone rule we termed Depressor Shift. In (54) of Chapter 3, the depressor was characterized as a segment underlyingly associated to a low tone:

(62) Depressor Consonant

Since low tones are only specified with the application of Low Tone Default, the representation in (62) is true of the depressor consonant before the application of Low Tone Default, after its application then the consonant is associated with a low tone. The laryngeal features and the low tone, as we indicated in Chapter 3, always spread onto the tautosyllabic vowel to the right.

(63) Depressor Assimilation

The claim that we are making here is that the low tone associated with the consonant is co-articulated with the tone associated with the tautosyllabic vowel. Recall that in Chapter 3 we indicated that the low tone associated with the

depressor has the phonetic quality [+extra - low]. This means that if the tautosyllabic vowel is associated with a low tone, then the syllable becomes associated with an extra-low - low tone sequence which, after the application of a low-level assimilation rule surfaces as an extra-low -extra-low tone sequence.

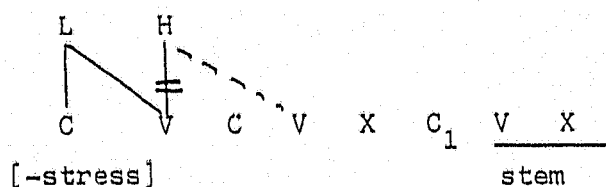
If, on the other hand, the tautosyllabic vowel is associated with a high tone, then the syllable becomes associated with an extra-low-high tone sequence. This extra-low-high tone cluster surfaces only when Depressor Shift cannot apply to it, otherwise it also surfaces as an extra-low -extra-low tone cluster.

In Zulu tonology, low - high tone clusters are highly marked. Recall that up to the present moment the only tone clusters that have occurred with bimoric vowels either in underlying representations or in the course of derivations have been low-low, high-high and high-low. If the low-high tone sequence is a highly marked tone cluster in Zulu tonology - created here by the unusual circumstance of a low tone associated with a consonant - then the motivation for Depressor Shift - a rule that dissolves such clusters - becomes evident.

(64) Depressor Shift

Tonal Tier

CV Tier



The rule shifts the high tone of a low-high tone cluster associated with an unstressed syllable, to the vowel of the syllable to its immediate right, on condition that that vowel is not in a word-final syllable. The rule, of course, will not apply if the consonant to the immediate right of the high tone is a depressor, since, in that case, the depressor will be associated with a low tone, and Depressor Shift could not apply without violating the Crossed Lines Constraint.

The syllable to which Depressor Shift applies must be [-stress] because the rule does not apply to stressed syllables. The ideophone /gilikidi/¹⁰ "falling down" provides a suitable example of the effect of stress on Depressor Shift. The high tone associated with the initial syllable does not shift to the next syllable, even though the second syllable in neither word-final nor does it incorporate a depressor. Our claim is that it is the feature [+stress] (represented by the double lines) in the first syllable of the ideophone above that blocks the application of Depressor Shift.

The following sample derivation illustrates the failure of Depressor Shift to apply when the consonant to the immediate right of the high tone is also a depressor:

(65) Sample Derivation:

H
|
u ku gijimV a "to run"
 phrase

ûkugiji(ma)

Lexical Component

Extratonicity Marking

H
|
ûkugiji(ma)
ukugijima

Rightward Shift (iterative)

Removal of Extratonicity

Post-lexical Component

H
|
ukugijiima

Prepausal Lengthening

ûkûgijîimâ
ûkûgijîimâ
ukugijî:ma

Phonetic Component

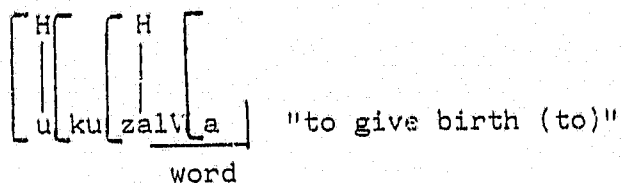
Low Tone Default

Depressor Assimilation

In the derivation above, Depressor Shift fails to shift the high tone of the low-high tone cluster on /gi/ to the syllable to the right, i.e. /ji/ because the latter incorporates the depressor /j/. Depressor Assimilation spreads the segmental and tonal features of depressors /g/ and /j/ onto the tautosylla vowels. There is no practical way of representing the fact that the low tones associated with the depressors are co-articulated with both the consonants and the vowels. Whenever the reader meets a low-high or low-low tone cluster marking, he is to interpret that to mean that the low tone component to the left is associated with both the vowel and the consonant to its immediate left.

In the next derivation, Depressor Shift fails to apply because its application would result in shifting the high tone to the word-final syllable:

(66) Sample Derivation:



úkùžálà

úkùžálà

úkuzála

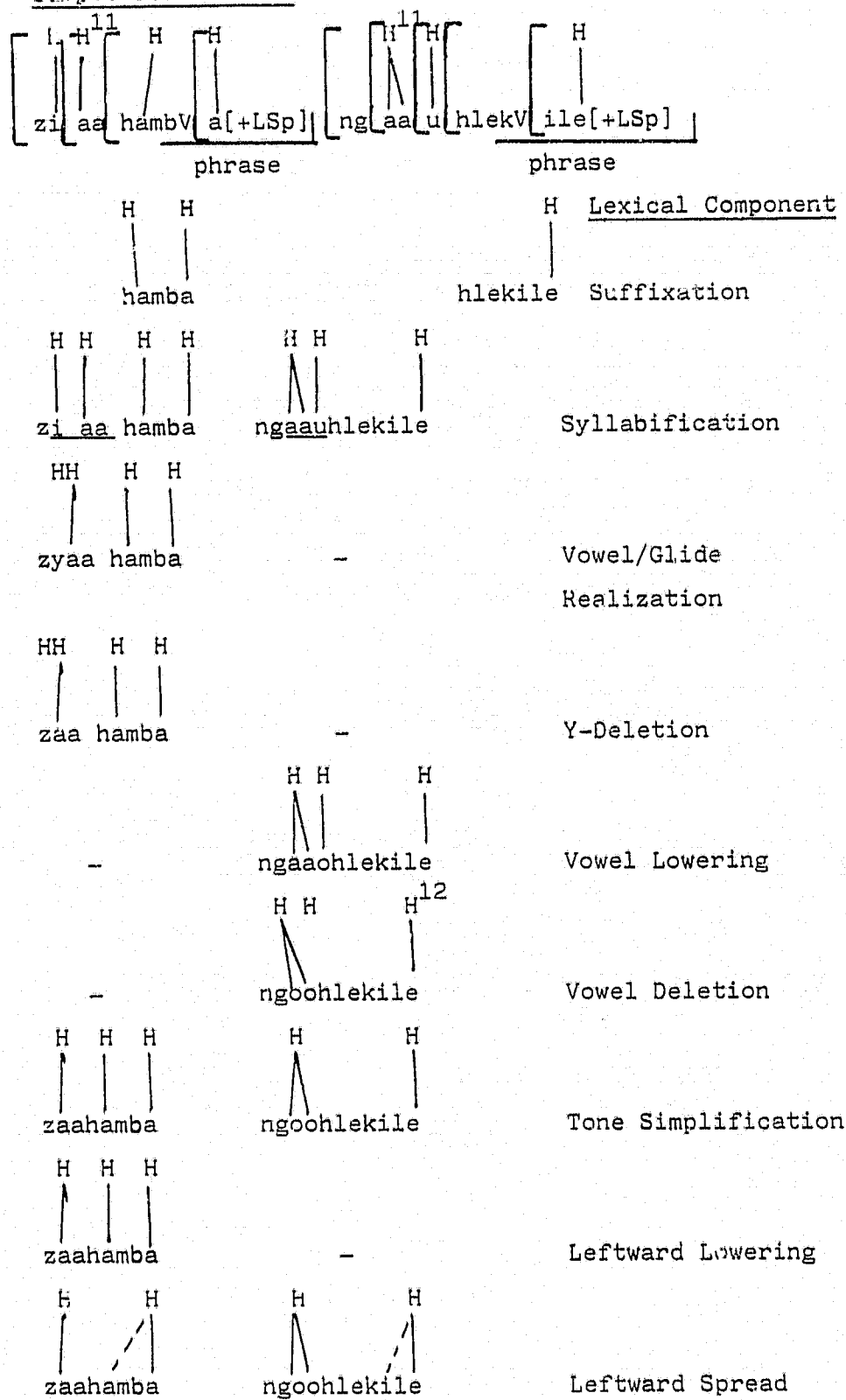
Phonetic Component

Low Tone Default

Depressor Assimilation

In the example above, we claim that the high tone on /za/ did not shift to /la/ because the latter is a word-final syllable.

The following sample derivations illustrate that Depressor Shift does not apply to a high tone on a bimoric vowel.

(67) Sample Derivations

Postlexical Component

$\begin{array}{c} \text{H} \quad \text{H} \\ \quad \diagup \diagdown \\ \text{zaahaamba} \end{array}$	$\begin{array}{c} \text{H} \quad \text{H} \\ \quad \diagup \diagdown \\ \text{ngoohlekiile} \end{array}$	Prepausal Lengthening
$\begin{array}{c} \text{H} \quad \text{H} \\ \quad \diagup \diagdown \\ \text{zaahaamba} \end{array}$	$\begin{array}{c} \text{H} \quad \text{H} \\ \quad \diagup \diagdown \\ \text{ngoohlekiile} \end{array}$	High Dissimilation
$\begin{array}{c} \text{H} \quad \text{H} \\ \quad \diagup \diagdown \\ \text{zaahaamba} \end{array}$	$\begin{array}{c} \text{H} \quad \text{H} \\ \quad \diagup \diagdown \\ \text{ngoohlekiile} \end{array}$	Phrase Final Lowering

Phonetic Component

záàháàmhà	ngóóhlekíilè	Low Tone Default
zǎ:hā:mbà	ngǒ:hlekí:le	
"they left"	"it is the one who laughed"	

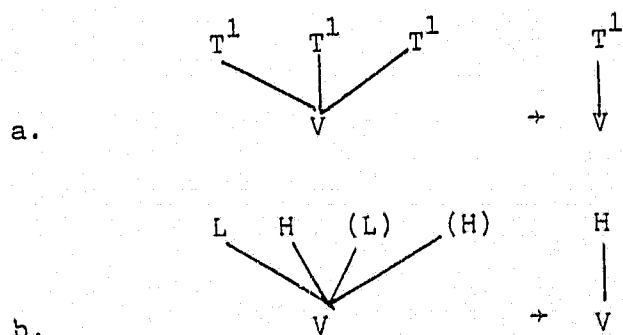
In the examples above, Depressor Shift has failed to apply to the bimoric vowels of the first syllable. The reason is clearly evident: shifting the high tone onto the rightmost mora of a bimoric vowel would not dissolve the low-high tone cluster since the mora originally associated with the high tone would then become associated with a low tone at the application of Low Tone Default. That is why this rightmost mora of a bimoric vowel was not made the target of Depressor Shift.

Leftward Lowering also does not apply to the subject prefix high tone in the first example because of the intervention of the remote past tense marker /aa/. All the other rules apply as expected.

In the last three sample derivations, we have illustrated the different environments that block the application of Depressor Shift; in (65) it was the occurrence of another depressor in the syllable to the immediate right; in (66) the target syllable was the word-final syllable; and in (67) the syllable incorporating the depressor and the high tone to be shifted was bimoric. Now before supplying a sample derivation where Depressor Shift does apply, we need to return to Tone

Simplification to consider how it applies after Low Tone Default has specified the low tones.

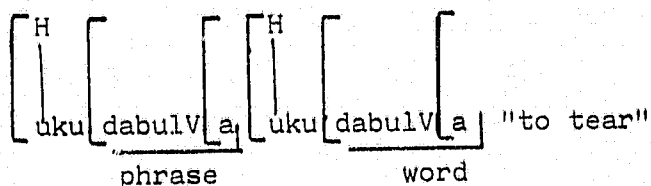
(68) Tone Simplification



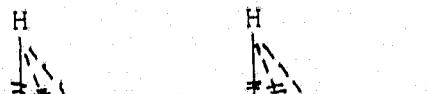
Condition: This rule does not apply to the low tone linked to both a vowel and a depressor.

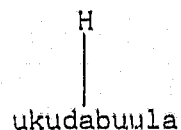
This rule is in the form of two statements: if two or more similar tones cluster on a vowel, then they are simplified to one such tone. If, on the other hand, a sequence of unlike tones cluster on one vowel, then the vowel will associate with one high tone. A low tone linked also to a depressor, however, is exempt from the application of this rule.

(69) Sample Derivations



ú kudabu(1a) ú kudabu(1a)


 ukudabu(1a) ukudabu(1a)
 ukudábula ukudábula


 ukudabuula

Lexical Component

Extratonicity Marking

Rightward Shift (iterative)

Removal of Extratonicity

Postlexical Component

Prepausal Lengthening

		Phonetic Component
ùkùdábùulà	ùkùdábùlā	Low Tone Default
ùkùdábùulā	ùkùdábùlā	Depressor Assimilation
L LL HLL L ukudabuula	L LLH L L ukudabula	Depressor Shift
L LL HL L ukudabuula	L LL H L ukudabula	Tone Simplification
ukudàbù:la	ukudàbùlā	

Depressor Shift which in earlier studies like those of Lanham (1960), Cope (1966) and Khumalo (1982) is termed Tonal Displacement, has always been considered to have, as its motivating factor, the incompatibility of a high tone and a depressor consonant. This is the first study, we think, that proposes the dissolution of an unfavoured cluster as the motivation.

One final point on the tonal effect of depressors concerns what is sometimes referred to as Depressor Lowering. A depressor conditions the lowering of the pitch of any sequence of low tones within which it occurs, and this we refer to as Depressor Lowering. Compare the surface tones of these two words whose underlying tonal structure is identical:

(70)

- a. isiphukuphuku "fool" H
 [- - - -] < isi phukuphuku#
- b. iziphukuphuku "fools" H
 [- - - -] < izi phukuphuku#

The same lexical and post-lexical rules apply to both examples above (i.e. Rightward Shift following Extratonicity Marking, and the relevant post-lexical rules). The only difference between these two forms is tonetic, viz. the first three tones

in (70)(b) are low tones of fairly low pitch, having assimilated to the extra-low pitch associated with the depressor in the second syllable. This is what is referred to as Depressor Lowering - a low-level phonetic rule, in our opinion. To other analysts, however, Depressor Lowering is a phonological rule. Clark (forthcoming) concurs with Laughren (1984) that "depressor consonants project tonal features ... the features for extra-low tone ... onto the tonal tier. Evidence that Depressor Lowering involves the insertion of a tonal autosegment, rather than simply a phonetic influence from the consonant (as proposed by Lieber (ms.)), is provided by the interaction of this rule with other tonal phenomena ... for example, by the fact that the rule is blocked in nouns such as the following, which belong to the tonal class of ámà - khósí "chief":

(41)

a. úm-[!]fází
 V V
 H H

b. íí[!]nkúnzí
 V V
 H H

c. úbú[!]hlúngú
 V V
 H H

d. íí[!]khándá
 V V
 H H

(Clark (forthcoming))"

Depressor Lowering would not apply to the examples supplied by Clark above because all the tones in the environment are high. This rule, as we indicated earlier, conditions the low tones in the environment of a depressor to assimilate to its [+extra low] tone. Even more important, we question the very data that Clark presents in (41) for analysis. Clark and Laughren (1984) quote Rycroft and Cope as their sources for them. The surface forms analysed in Clark's (41) do not occur in any Zulu dialect that we know. To the best of our knowledge, the only possible surface forms for the nouns in Clark's (41) are the following:

(71)

(i) Most KwaZulu and Natal Coast dialects - phrase finally

- a. úmfâ:zí ~ úm¹fâ:zí "woman"
- b. í¹nkû:nzí "bull"
- c. úbuhlû:ngû ~ úbú¹hlû:ngû "pain"
- d. í:khâ:ndâ "head"

(ii) Some Natal Coast dialects - phrase finally

- b. úmfa:zí ~ úmfa:zí
- b. í¹nkû:nzí
- c. úbuhlu:ngû ~ úbú¹hlû:ngû
- d. í:kha:ndâ

(iii) All dialects - phrase medially

- a. úmfazí ~ úmfazí
- b. í¹nkunzí
- c. úbuhlungû ~ úbú¹hlungû
- d. í:khandâ

We feel that Clark and Laughren would have provided different analyses if instead, they had the data in (71) at their disposal. To conclude, we reaffirm our position that Depressor Lowering is a low-level phonetic rule where a sequence of low tones assimilate to the [+extra low] tone of a depressor in the environment. This brings to a conclusion our discussion of Depressor Shift and the tonological effect of depressors.

4. Indicative, Participial, Present Tense

We will break up our discussion of this construction into four sections: 'toned' stems with SP/OP; 'untuned' stems with SP/OP; 'toned' stems with be/se and 'untuned' stems with be/se.

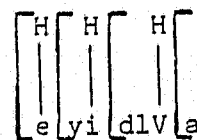
4.1 'Toned' Stems with SP/OP4.1.1 Phrase Final Position

(72) Examples:

a. úma ê:dlà## "if he eats"



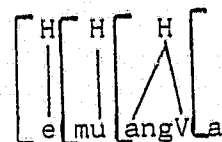
b. úma é'yî:dlà## "if he eats it"



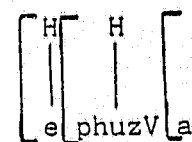
c. úma ângà## "if he kisses"



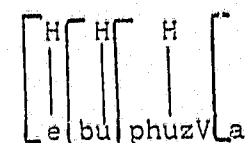
d. úma é'mâ:ngà## "if he kisses her"



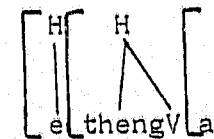
e. úma ephú:zà## "if he drinks"



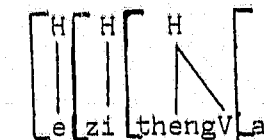
f. úma ébuphú:zà## "if he drinks it"



g. úma ethê:ngà## "if he buys"



h. úma ézithê:ngà## "if he buys them"



- i. úma esá:ba## "if he is afraid" $\left[\begin{array}{c} H \\ | \\ e \end{array} \right] \left[\begin{array}{c} H \\ | \\ esabV \end{array} \right] a$
- j. úma émesá:ba## "if he fears him" $\left[\begin{array}{c} H \\ | \\ e \end{array} \right] \left[\begin{array}{c} H \\ | \\ mu \end{array} \right] \left[\begin{array}{c} H \\ | \\ esabV \end{array} \right] a$
- k. úma ekhumú:la## "if he undresses" $\left[\begin{array}{c} H \\ | \\ e \end{array} \right] \left[\begin{array}{c} H \\ | \\ khumulV \end{array} \right] a$
- l. úma élikhumú:la## "if he takes it off" $\left[\begin{array}{c} H \\ | \\ e \end{array} \right] \left[\begin{array}{c} H \\ | \\ li \end{array} \right] \left[\begin{array}{c} H \\ | \\ khumulV \end{array} \right] a$

We have met all the rules that apply in the examples above. Leftward Lowering followed by Leftward Spread apply in (72)(a) and (b), while in all the other examples only the former applies. The segmental and postlexical rules applying have also all been met and illustrated in a number of sample derivations.

4.1.2 Phrase Medial Position

(73) Examples

- a. úma edlà#
- b. úma éyidlà#
- c. úma angà#
- d. úma émangà#
- e. úma ephúzà#
- f. úma ébuphúzà#
- g. úma ethengà#
- h. úma ézithengà#
- i. úma esába#
- j. úma émesába#
- k. úma ekhumúla#
- l. úma élikhumúla#

We have met all the tonal rules that apply in (73).

4.2 'Untoned' Stems with SP/OP4.2.1 Phrase Final Position

(74) Examples:

a. úma e:lwa ##

"if he fights"

$$\begin{array}{|c|} \hline H \\ \hline | \\ \hline e_lwV \\ \hline \end{array} a$$

b. úma é'yí:lwa##

"if he fights it"

$$\begin{array}{|c|} \hline H \\ \hline | \\ \hline e_yi_lwV \\ \hline \end{array} a$$

c. úma ó:sa##

"if he roasts"

$$\begin{array}{|c|} \hline H \\ \hline | \\ \hline e_osV \\ \hline \end{array} a$$

d. úma é'yó:sa##

"if he roasts it"

$$\begin{array}{|c|} \hline H \\ \hline | \\ \hline e_yi_osV \\ \hline \end{array} a$$

e. úma ephé:ka##

"if he cooks"

$$\begin{array}{|c|} \hline H \\ \hline | \\ \hline e_phekV \\ \hline \end{array} a$$

f. úma ékuphé:ka##

"if he cooks it"

$$\begin{array}{|c|} \hline H \\ \hline | \\ \hline e_ku_phe:kV \\ \hline \end{array} a$$

g. úma élu:ka ##

"if she knits"

$$\begin{array}{|c|} \hline H \\ \hline | \\ \hline e_lukV \\ \hline \end{array} a$$

h. úma é'lélu:ka##

"if she knits it"

$$\begin{array}{|c|} \hline H \\ \hline | \\ \hline e_li_lukV \\ \hline \end{array} a$$

i. úma behláku:la## "if they weed"

$\left[\begin{array}{c} H \\ | \\ be \end{array} \right] hlakuV \left[a \right]$

j. úma béyihláku:la## "if they weed it"

$\left[\begin{array}{c} H \\ | \\ be \end{array} \right] \left[\begin{array}{c} H \\ | \\ yi \end{array} \right] hlakuV \left[a \right]$

We have met all the rules that apply to the examples in (74). In (a), (b), (c) and (d) no lexical tone rules apply, while Rightward Shift applies in examples (e) and (f). It will be recalled that in the discussion leading to (39), it was indicated that a tonally unassociated CVCV verbal radical immediately preceded by the subject or object prefix is exceptionally exempt from Extratonicity Marking. That is the reason why Rightward Shift applies to the examples in (e) and (f), but not to those in (g) and (h). It may be confusing that after the application of segmental rules these two types of verbal radicals (i.e. CVCV and VCVCV) seem to assume the same shape, i.e. XVCVCV, and yet morphologically they remain distinct since the high toned vowel to the left is the SP/OP in examples (e) and (f), whereas it is neither SP nor OP in examples (g) and (h).

Otherwise, Rightward Shift applies as expected, i.e. after Extratonicity Marking, in examples (i) and (j).

(75) Sample Derivation:

$\left[\begin{array}{c} H \\ | \\ e \end{array} \right] elukV \left[a \right] \left[\begin{array}{c} H \\ | \\ e \end{array} \right] phukV \left[a \right] \left[\begin{array}{c} H \\ | \\ e \end{array} \right] gijimV \left[a \right]$
 phrase [-ET] phrase phrase

Lexical Component

H			
eeluka	-	-	Syllabification
H			
eluka	-	-	Vowel Deletion
élu(ka)	[-ET]	égi(ji)(ma)	Extratonicity Marking

	H epheka	H egiji(ma)	Rightward Shift
-	-	egijima	Removal of Extra- tonality
éluka			<u>Postlexical Component</u>
H eluuka	H epheeka	H egijiima	Prepausal Lengthening
			<u>Phonetic Component</u>
éluùkà	èphéékà	эгíjìimà	Low Tone Default
-	-	эгíjìimà	Depressor
			Assimilation
élu:ka	ephé:ka	egíjì:ma	

There is, however, a small class of tonally unassociated CVCV verbal radicals where Rightward Shift fails to apply, even though the environment seems correct. The verbs /suk/ and /hlal/ are representative of this class, as illustrated below:

(76) Exceptional 'untoned' CVCV Roots

- a. /úma ésuka/ instead of /uma *esúka/ "if he sets off"
 b. /úma éhlala/ instead of /uma *ehlála/ "if he sits"

Rightward Shift ought to apply to these verbs in the same manner in which it applied to /phek/ in (74)(e) and (f), and yet it does not. This suggests that for some tonal rules, this small class of CVCV verbal roots behave like underlying VCVCV verbal radicals (cf. úma éluka in (74)(g) and (h)). The opening formula for Zulu folktales, viz. /kwê:sukû:la/ "once upon a time", suggests that /suk/ in earlier times was /esuk/, otherwise this opening formula would be /*kw.:sukê:la/. For the other verbs in this class, the tonal evidence is the only one that suggests a possible earlier VCVCV form for these verbs.

4.2.2 Phrase Medial Position

(77) F

- a. úm. . #
- b. úma é^lyílwa#
- c. úma ósa#
- d. úma é^lyósa#
- e. úma ephéka#
- f. úma ékuphéka#
- g. úma éluka#
- h. úma é^lléluca#
- i. úma egǐjima#
- j. úma éligǐjima#

The same lexical rules that applied to the examples in (74) also apply to the examples in (77). There is no essential difference between these examples and those in (74) except for the application of Prepausal Lengthening in the latter.

4.3 'Toned' Stems with/be/ and /se/

4.3.1 Introduction

The objective in this section is to study verbal complexes that incorporate more than just the subject and object prefixes. In the discussion preceding (52), we indicated that phonetic verbal prefixes are of two types, those that are underlying prefixes and a few that are underlying deficient verbs. In Khumalo (1982) all phonetic verbal prefixes except the subject and object prefixes, present tense marker /ya/ and 'hortative'¹³ prefix /(m)a/ are considered underlying deficient verbs. This division was made in an endeavour to capture some tonological generalizations. In that analysis, for instance, Leftward Lowering in its application to subject prefixes was described as a separate rule viz. SP-Dissimilation. Five prefixes, viz. /be/, /se/, /se^H/, /sa^H/ and /bo^H/ also cause a subject prefix to their immediate left to delink from its high tone. In an attempt to generalize, all

4.2.2 Phrase Medial Position

(77) Examples:

- a. úma élwa#
- b. úma é'yílwa#
- c. úma ósa#
- d. úma é'yósa#
- e. úma ephéka#
- f. úma ékuphéka#
- g. úma éluka#
- h. úma é'léluka#
- i. úma egǐjima#
- j. úma éligǐjima¹⁴

The same lexical rules that applied to the examples in (74) also apply to the examples in (77). There is no essential difference between these examples and those in (74) except for the application of Prepausal Lengthening in the latter.

4.3 'Toned' Stems with/be/ and /se/

4.3.1 Introduction

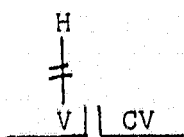
The objective in this section is to study verbal complexes that incorporate more than just the subject and object prefixes. In the discussion preceding (52), we indicated that phonetic verbal prefixes are of two types, those that are underlying prefixes and a few that are underlying deficient verbs. In Khumalo (1982) all phonetic verbal prefixes except the subject and object prefixes, present tense marker /ya/ and 'hortative'¹³ prefix /(m)a/ are considered underlying deficient verbs. This division was made in an endeavour to capture some tonological generalizations. In that analysis, for instance, Leftward Lowering in its application to subject prefixes was described as a separate rule viz. SP-Dissimilation. Five prefixes, viz. /be/, /se/, /se/, /sa/ and /bóo/ also cause a subject prefix to their immediate left to delink from its high tone. In an attempt to generalize, all

these instances of SP-lowering were treated as one rule, and all the morphemes to the immediate right of the subject prefixes were considered underlying 'toned' deficient verbs. That analysis presents a number of problems:

- a. We need a rule to associate /be/ and /se^H/ with high tones before the application of SP-Dissimilation, and thereafter we need another rule to delink that same high tone. This is extremely artificial.
- b. The prefix /sa^H/ is very problematic to handle under such an analysis because 'e, for purposes of SP-Dissimilation it may function as an underlying deficient verb, for purposes of other lexical rules, e.g. Rightward Shift it functions as a prefix, i.e. its high tone undergoes Rightward Shift in the lexical component.
- c. A number of verbal prefixes, e.g. negative prefix /nga/ and Conditional prefix /nga/ do not cause the SP to their immediate left to delink from their high tones.
- d. Crucially, the prefixes /be/, /se/, /se^H/ and /sa^H/ cause the SP high tone to delink in the indicative principal submood, the environment where, as we shall see later, Leftward Lowering does not apply. (i.e. where regular verbs do not condition the SP delinking).

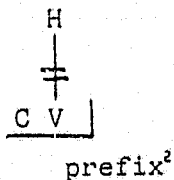
These are the reasons why in the discussion relating to (51) we decided to use different criteria for classifying some phonetic prefixes as underlying deficient verbs and prefixes. We, therefore, need to formulate special rules that apply to some of these prefixes:

(78) SP-Lowering



SP Prefix¹
where prefix¹ = /be/, /se^H/, /sa^H/, /aa^H/ or /boo^H/.

This rule states that a subject prefix immediately preceding prefix /be/, /se^H/, /sa^H/, /aa^H/ or /boo^H/ delinks from its high tone.

(79) Participial Lowering

Indicative, participial submood
 where prefix² = prefixes /se/ and /aa/

This rule is an allomorphy rule for the morpheme /se/ and remote past /aa/, i.e. they are high-toned in all environments excepting the indicative, participial sub-mood.

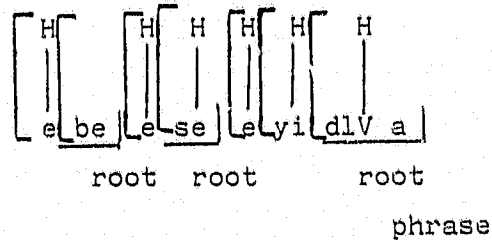
After this long deviation, let us now return and consider toned stems incorporating /be/ or /se/.

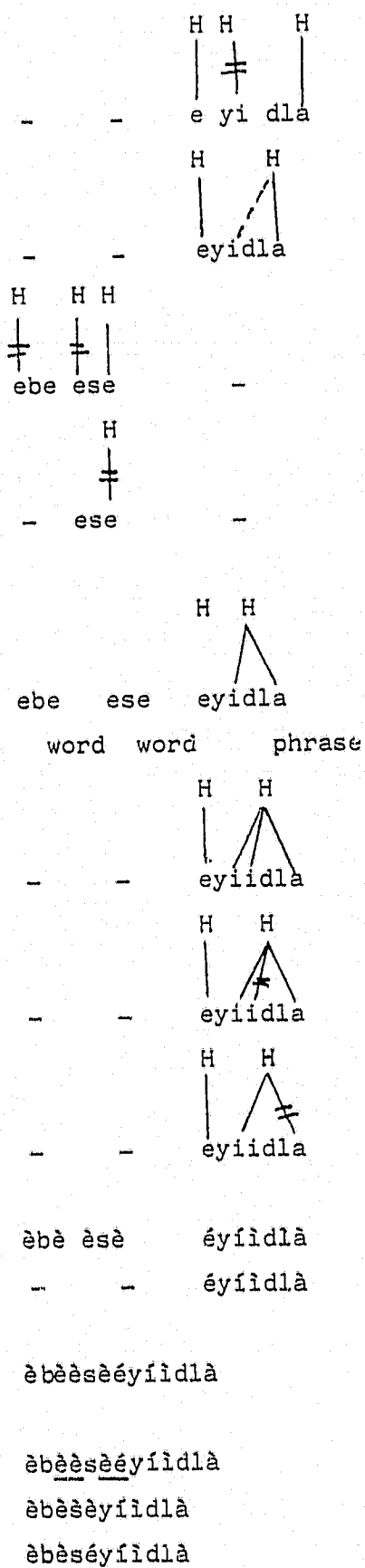
4.3.2 Phrase Final Forms

(80) Examples:

- | | | |
|----|----------------------------------|--------------------------------------|
| a. | úma ebesé ¹ yí:dlà## | "If he was already eating it" |
| b. | nóma besengā ² :zì ## | "although I already knew" |
| c. | úma ibisihá:mbà ## | "If it was already leaving" |
| d. | nóma ubusuthā:ndà## | "Even though you already wanted to" |
| e. | úma sengèsá:ba ## | "If I'm already scared" |
| f. | úma ebesébadûbú:la## | "If he was already shooting at them" |

The only new rules that will apply to the verbs above are the two special rules we have just described.

(81) Sample Derivation

Lexical Component

Leftward Lowering

Leftward Spread

SP-Lowering

Participial Lowering

Postlexical Component

Prepausal Lengthening

High Dissimilation

Phrase Final Lowering

Phonetic Component

Low Tone Default

Depressor

Assimilation

Word Boundary

Deletion

Syllabification

Postlexical Deletion

Tone Simplification

Participial Lowering is sometimes one's only cue for distinguishing certain minimal pairs, e.g.

(82) Examples:

- a. sé^lbéfikî:le, nîngàphá:ka ## "They have arrived, you may dish up"
- b. sebéfikî:le, nîngàphá:ka ## "when they have arrived, you may dish up"

Example (82)(a) is in the indicative principal sub-mood, and that is why the prefix /se/^H surfaces with a high tone. Example (82)(b) on the other hand, is in the indicative participial, where Participial Lowering has applied to the prefix /se/. (The conditioning conjunction /uma/-"when" optionally deletes in (82)(b)).

4.3.3 Phrase Medial Forms

(83) Examples:

- a. úma ebeséyidlâ #
- b. noma besengâzî #
- c. úma ibisihâmbâ #
- d. noma ubusuthandâ #
- e. úma sengèsâba #
- f. úma ebesébadûbûla #

Predictably, the tonal patterns of Examples (83)(a), (b) and (d) differ from those of their phrase final counterparts, but we have met all the rules that apply to all the forms in (83).

4.4 Untoned Stems with be/se

4.4.1 Phrase Final Forms

(84) Examples:

- a. nŏma ebesé:lwa ## "Although he was already fighting"
- b. nŏma besengě:hla## "Although I was already alighting"
- c. nŏma bəsesəphé:ka## "Although we were already cooking"
- d. úma ebeséna:ba ## "If he was already stretching his legs"
- e. nŏma ibisigíjî:ma## "Although it was already running"

There are no problems in these examples, the relevant 'verbal prefix' rules apply in each case. In all the examples, the high tone on the final subject prefix surfaces because low verbal stems do not trigger Leftward Lowering. The high tone on the final subject prefix surfaces on the subject prefix vowel in (84)(a), in (b) and (d) it surfaces on the initial vowel of the verb, after the application of the relevant segmental rules. In examples (c) and (e), it shifts onto the verbal stem through the application of Rightward Shift.

4.5 Conclusion

Excepting for SP-Lowering and Participial Lowering - rules that are not general, but that apply only in the context of verbal prefixes - the general tone rules that applied to infinitives also applied to verbs in the participial. Leftward Lowering, in its application to prefixes, as we shall see later, is almost entirely restricted to the participial.

5. The Indicative, Principal, Present Tense

Now we will discuss all the verbal radicals under four headings: phrase final stems with SP/OP; phrase medial stems with SP/OP; phrase final stems with /sa^H/; and phrase medial stems with /sa^H/.

5.1 Phrase Final Stems with SP/OP

5.1.1 Toned Stems

(85) Examples:

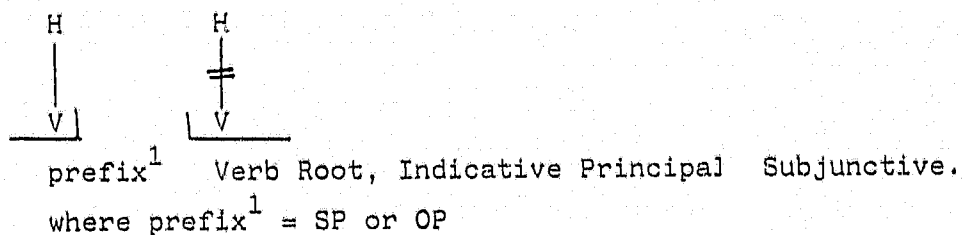
a.	úya:phá ##	"He gives"
b.	úyamú:pha ##	"He gives him"
c.	ú ^l yó:na ##	"he spoils"
d.	úyamó:na ##	"He spoils him"
e.	úyafú:ndà ##	"He reads"
f.	uyáyifú:ndà##	"He reads it"
g.	úyabó:na ##	"He sees"
h.	uyábabó:na ##	"He sees them"

- | | | |
|----|-----------------|------------------------|
| i. | úyesá:ba## | "He is afraid" |
| j. | uyábesá:ba## | "He is afraid of them" |
| k. | liyádûbû:la## | "He shoots" |
| l. | liyábadûbû:la## | "He shoots at them" |

We will need a rule to delink the high tone from the monosyllabic root /ph / in (85)(b). This will be a rule that is triggered by a high tone in the preceding syllable, since it does not apply in (85)(a). Our new rule will have to be ordered to apply before Leftward Lowering, otherwise the latter rule would bleed it by delinking the high tone of the preceding subject or object prefix. Finally, the rule will have to be triggered by a high tone associated with an SP/OP prefix only, since a high tone associated with another prefix does not trigger this rule, as forms like /usâ:phá/ "he still gives" illustrate.

The rule for lowering the monosyllabic high toned radical in (85)(b) we will term Monosyllabic Lowering. It is a rule with very limited application - it will be triggered by the subject prefix or the object prefix in just a few constructions.

(86) Monosyllabic Lowering



Condition: The rule does not apply when the prefix is the object prefix in the subjunctive.

The rule, as we have just stated, will lower a high toned monosyllabic verb if it is immediately preceded by a high toned SP/OP in the indicative principal or subjunctive mood.

(87) Sample Derivation:

$$\begin{array}{c} \boxed{H} \quad \boxed{H} \quad \boxed{H} \\ | \quad | \quad | \\ \boxed{u} \boxed{ya} \boxed{mu} \boxed{phV} \boxed{a} \# \# \end{array}$$
Lexical Component

$$\begin{array}{c} H \quad H \quad H \\ | \quad | \quad | \\ uyamupha \end{array}$$
Monosyllabic LoweringPostlexical Component

$$\begin{array}{c} H \quad H \\ | \quad / \\ uyamuupha \end{array}$$
Prepausal LengtheningPhonetic Component

úyàmúúphâ

Low Tone Default

It is worth noting that Monosyllabic Lowering conditions dialectal variation in the infinitive since some Natal Coast dialects apply the rule to verbs in the infinitive:

(88) Examples:

<u>KwaZulu dialects</u>	<u>Natal Coast dialects</u>	
úkumú:pha	úkumú:pha	"to give him"
úkuyí:dlà	úkuyí:dlà	"to eat it"

In the examples above, Leftward Spread has applied to the forms in the KwaZulu dialect, but in the Natal Coast dialects Monosyllabic Lowering has applied. By now it should be evident that the major difference in the tonology of the KwaZulu dialects and the Natal Coast dialects is that the former dialects favour the high-low tone cluster while the latter dissolve such clusters whenever possible. With toned VCV verbal radicals, the Natal Coast dialects employ Left Branch Delink (a post-lexical rule) in the lexical component in order to avoid the formation of the high-low tone cluster. In toned CVCV verbal radicals, it is Right Branch Delink that is employed lexically to avoid the cluster, while in the examples in (88) it is Monosyllabic Lowering that is employed.

(89)	<u>KwaZulu Dialects</u>	<u>Natal Coast Dialects</u>	
	úk'ô:na	úko:ná	"to spoil, sin"
	úk'wê:ba	úkwe:bá	"to steal"
	úkubô:na	úkubó:na	"to see"
	úkuthâ:nda	úkuthá:ndà	"to like, love"
	úkuyî:dla	úkuyí:dlà	"to eat it"

1. get back to the examples in (85), the derivation in (87) accounts for Example (85)(b). Examples (85)(c) and (d) as well as (g) and (h) illustrate the application of Right Branch Delink (see (14)) which neutralizes the tonological distinction between the high toned stems of the (e), (f) type and those of the (g), (h) type.

No lexical tone rules apply in examples (85)(a), (e) and (i) while Rightward Shift applies in example (85)(k). In (85)(c) and (g), Right Branch Delink applies while in (85)(d) both Right Branch Delink and Leftward Lowering apply, and in (85)(h) three lexical tone rules apply, viz. Right Branch Delink, Leftward Lowering and Rightward Shift. In examples (85)(f), (j) and (l), Leftward Lowering and Rightward Shift apply.

5.1.2 Untoned Stems

(90) Examples:

a.	uyá:lwa ##	"He is fighting"
b.	úyayí:lwa ##	"He fights it"
c.	bayô:sa ##	"They are roasting"
d.	báyayó:sa ##	"They are roasting it"
e.	ngiyaphe:ka ##	"I am cooking"
f.	ngiyakuphé:ka ##	"I am cooking it"
g.	uyémbâ:tha ##	"He dresses"
h.	úyayémbâtha ##	"He wears it"
i.	bayaqábu:la ##	"They kiss"
j.	bayábáqábu:la ##	"They kiss them"

Low roots are relatively straightforward. No lexical tone rules apply in (90)(b), (d), (e) and (h) while Rightward Shift applies in all other cases.

5.2 Phrase Medial Stems with SP/OP

5.2.1 Toned Stems

(91) Examples:

a.	údlâ #	"He eats"
b.	uyídlâ #	"He eats it"
c.	wóna #	"He spoils"
d.	uyóna #	"He spoils it"
e.	baphúza #	"They drink"
f.	babuphúza #	"They drink it"
g.	libóna #	"He sees"
h.	libabóna #	"He sees them"
i.	wesába #	"He fears"
j.	umesába #	"He fears him"
k.	ukhutháza #	"He encourages"
l.	ubakhutháza #	"He encourages them"

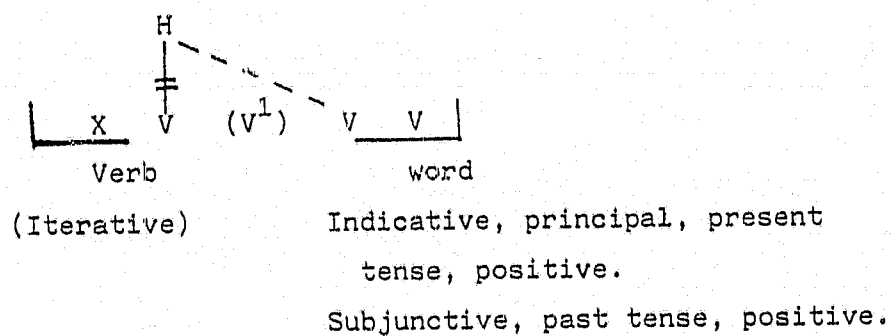
There is a special tonal configuration that characterizes verbs in phrase medial position in the indicative, principal, present tense, positive conjugation, viz. if the verb has one or more morphemes associated with a high tone, in this construction only one high tone will surface, and that tone will be associated with the penultimate syllable. This pattern is even more dramatically illustrated in verbs incorporating other toned prefixes:

(92) Examples:

a.	$\begin{bmatrix} \text{H} & \text{H} & \text{H} \\ & & \\ \text{u} & \text{sa} & \text{li} \end{bmatrix} \text{culV} \text{a} \rightarrow \text{usalicúla}$	"he still sings it"
b.	$\begin{bmatrix} \text{H} & \text{H} & \text{H} & \text{H} \\ & & & \\ \text{u} & \text{sa} & \text{bu} & \text{phuzV} \end{bmatrix} \text{a} \rightarrow \text{usabuphúzâ}$	"he still drinks it"

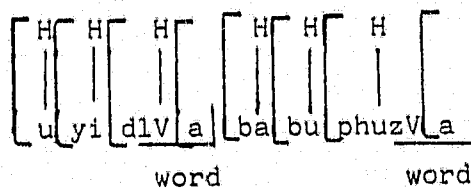
We need an iterative rule that attracts all high tones to the left of the penult vowel onto that vowel in this construction. After the high tones have shifted to the penult vowel then Tone Simplification applies.

(93) Penult Shift

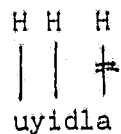


The rule states that within a verb in phrase medial position, the high tone to the left of the penultimate syllable shifts onto the vowel of that syllable in the positive conjugation of the present tense, indicative, principal submood and past subjunctive. This rule applies iteratively. The rule is a postlexical rule since it is sensitive to a phrase boundary.

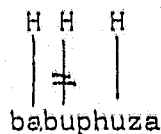
(94) Sample Derivations



Lexical Component



Monosyllabic Lowering



Leftward Lowering

Postlexical Component

H H
 | |
 + |
 uyidla

H H
 | |
 + |
 babuphuza

Penult Shift

H
 |
 uyidla

H
 |
 babuphuza

Tone Simplification

Phonetic Component

ùyidlà
 ùyidlā

bàùphùzà
 bàùphùzā

Low Tone Default

Depressor Assimilation

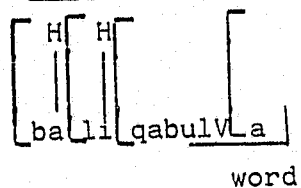
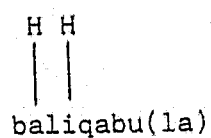
The motivation for this rule will again be penultimate syllable prominence.

5.2.2 Untoned Stems

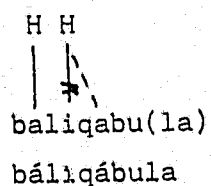
(95) Examples:

- | | | |
|----|-------------|---------------------|
| a. | ngilwa# | "I fight" |
| b. | ngiyilwa# | "I fight it" |
| c. | wosa# | "You roast" |
| d. | uyósa# | "You roast it" |
| e. | babhěka# | "They look at" |
| f. | bababhěka# | "They look at them" |
| g. | wembătha# | "He wears" |
| h. | uyembătha# | "He wears it" |
| i. | l qabúla# | "They kiss" |
| j. | baliqabúla# | "They kiss it" |

We have met all the rules that apply to these verbs, but we will supply a derivation since the iterative application of Penult Shift had not been illustrated.

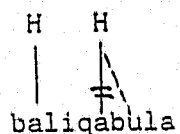
(96) Sample Derivation:Lexical Component

Extratonicity Marking

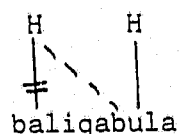


Rightward Shift

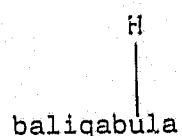
Removal of Extratonicity

Postlexical Component

Penult Shift



Penult Shift



Tone Simplification

Phonetic Component

bàliqàbùlà

Low Tone Default

5.3 Phrase Final Stems with /sa/5.3.1 Toned Stems(97) Examples:

- a. usâ:dlǎ ##
 b. usá'yí:dlà ##
 c. sisé:ba##
 d. sisá'yé:ba ##
 e. basá'phú:zà ##

"He is still eating"

"He is still eating it"

"We still steal"

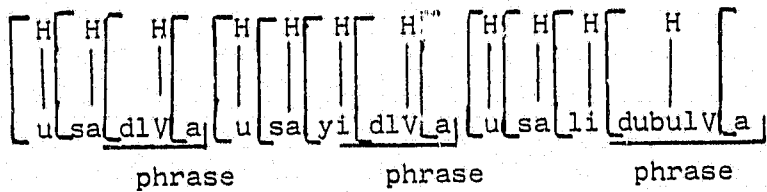
"We still steal it"

"They still drink"

- | | | |
|----|-----------------------------|-----------------------------|
| f. | basábuphú:zá## | "They still drink it" |
| g. | basá ¹ thé:ngà## | "They still buy" |
| h. | basáwathó:ngà## | "They still buy them" |
| i. | usé ¹ sá:ra## | "He is still afraid" |
| j. | usámesá:ba## | "He 's still afraid of him" |
| k. | asádùbú:la## | "They sti l shoot" |
| l. | asásidùbú:la## | "They sti_l shoot at us" |

Let us supply a few sample derivations to illustrate the application of rules in the verbs above:

(98) Sample Derivations:



Lexical Component

	H H H H		
	≠		
-	usayidla	-	Monosyllabic Lowering
H H H	H H H	H H H H	
≠	≠	≠	
usadla	usayidla	usalidubula	SP-Lowering

$$\begin{array}{ccc} H & H & H \\ | & | & | \\ \text{us} & \text{alidubula} & \end{array}$$
 Leftward Lowering
Postlexical Component




 Prepausal Lengthening

$\begin{array}{cc} \text{H} & \text{H} \\ | & | \\ \text{A} & \text{I} \\ \text{A} & \text{I} \\ \text{usaadla} & \text{---} \end{array}$

High Dissimilation
Phonetic Component

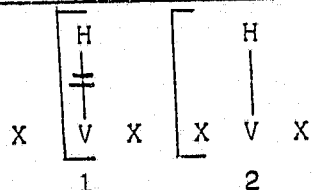
ũsáãdlá ũsáyídlá ũsáíldũbúúlá Low Tone Default
 usâ:dlá usá'yí:dlá usáíldũbú:la

One of the main reasons we advanced in 4.3.1. for distinguishing between SP-Lowering and Leftward Lowering was that they applied in different environments viz. Leftward Lowering does not apply in the indicative principal sub-mood, while SP-Lowering does. At the time Leftward Lowering was not yet formulated to incorporate this condition. The indicative, principal, present tense, i.e. the tense of the verbal stems we have been considering in this whole section, does not provide clear evidence on this issue. The clearest evidence on the difference between SP-Lowering and Leftward Lowering is provided in the indicative, principal, perfect tense:

(99) Examples:

- a. $\acute{u}m\acute{i}:le$ "he is standing" $\begin{bmatrix} H & H \\ | & | \\ u & mV \\ \end{bmatrix} ile$
- b. $us\acute{a}m\acute{i}:le$ "he is still standing" $\begin{bmatrix} H & H & H \\ | & | & | \\ u & sa & mV \\ \end{bmatrix} ile$
- c. $\acute{u}sebenz\acute{i}:le$ "he has worked" $\begin{bmatrix} H & & H \\ | & & | \\ u & & sebenzV \\ \end{bmatrix} ile$
- d. $us\acute{a}sebenz\acute{i}:le$ "he has still worked" $\begin{bmatrix} H & H & & H \\ | & | & & | \\ u & sa & & sebenzV \\ \end{bmatrix} ile$

In examples (99)(a) and (c), the subject prefix is to the immediate left of a toned verbal stem and yet Leftward Lowering fails to apply. Our claim is that it is the principal sub-mood that blocks the application of Leftward Lowering, and yet, as examples (99)(b) and (d) illustrate, SP-Lowering applies in this sub-mood. This situation calls for a reformulation of Leftward Lowering:

(100) Leftward Lowering

Condition: 1. If 1 = SP/OP, then 2 = verbal radical.
 If 1 = verbal radical, then 2 = verbal suffix.

2. The rule does not apply to the subject prefix in the positive conjugation of the indicative, principal submood and the subjunctive mood.

3. The rule does not apply to an OP immediately preceded by the negative prefix /nga/.

We will illustrate the failure of Leftward Lowering to apply in the subjunctive, when we discuss that construction (see 6.2).

There are no further complications in the examples in (92), all the other rules that apply we have encountered and discussed.

5.3.2 Untoned Stems

(101) Examples:

a.	basá:lwa ##	"They are still fighting"
b.	basá'yí:lwa ##	"They are still fighting it"
c.	basó:sa ##	"They still roast"
d.	basá'yó:sa ##	"They still roast it"
e.	baságè:zà ##	"They still wash"
f.	basáyigèzà ##	"They still wash it"
g.	basémbà:tha ##	"They still dress"
h.	basá'yémbà:tha ##	"They still wear it"
i.	basahláku:la ##	"They still weed"
j.	basáyihláku:la ##	"They still weed it"

We have met all the rules that apply to the examples in (101), but there are two examples that merit some discussion, viz. examples (e) and (f). In the discussion immediately preceding (39) we indicated that tonally unassociated CVCV verbal radicals immediately preceded by SP/OP are exempt from Extratonicity Marking and as a result undergo Rightward Shift. This is the reason for the tonal difference between these two examples, i.e. in /basáǵè:zà/ Extratonicity Marking has applied, blocking the application of Rightward Shift, while in /basáyigě:zà/, Extratonicity Marking does not apply and this paves the way for the application of Rightward Shift.

(102) Sample Derivations

a.	$\begin{array}{ c c c } \hline H & H & \\ \hline & & \\ \hline ba & sa & gezV \\ \hline \end{array}$	$\begin{array}{ c c c c } \hline H & H & H & \\ \hline & & & \\ \hline ba & sa & yi & gezV \\ \hline \end{array}$	
	phrase	[-ET] phrase	
			<u>Lexical Component</u>
	$\begin{array}{ c c } \hline H & H \\ \hline & \\ \hline \neq & \\ \hline \end{array}$	$\begin{array}{ c c c } \hline H & H & H \\ \hline & & \\ \hline \neq & & \\ \hline \end{array}$	SP-Lowering
	basageza	basayigeza	Extratonicity Marking
	basáǵe(zǎ)	-	
		$\begin{array}{ c c } \hline H & H \\ \hline & \\ \hline & \neq \\ \hline \end{array}$	Rightward Shift
	basáǵeza	-	Removal of Extratonicity
			<u>Postlexical Component</u>
	etc. etc. etc.		
	basáǵè:zà	basáyigě:zà	

b.	$\begin{array}{c} \text{H} \quad \text{H} \\ \quad \\ \text{ba} \text{sa} \text{hlaku} \text{V} \text{a} \\ \text{phrase} \end{array}$	<u>Lexical Component</u>
	$\begin{array}{c} \text{H} \quad \text{H} \\ \quad \\ \neq \end{array}$	SP-Lowering
	basahlakula	Extratonicity Marking
	basáhlaku(1a)	
	$\begin{array}{c} \text{H} \\ \\ \neq \end{array}$	Rightward Shift
	basahláku(1a)	Removal of Extratonicity
	basahlákula	
	etc. etc. etc.	

Sample derivation (b) was provided to illustrate that /sa/ does not block Rightward Shift.

5.4 Phrase Medial Stems with /sa/

5.4.1 Toned Stems

(103) Examples:

a.	usápha#	"He still gives"
b.	usabápha#	"He still gives them"
c.	usákha#	"He still builds"
d.	usayákha#	"He still builds it"
e.	usafúna#	"He still wants"
f.	usayifúna#	"He still wants it"
g.	usaphúzà#	"He still drinks"
h.	usabuphúzà#	"He still drinks it"
i.	usakhulúma#	"He still speaks"
j.	usasikhulúma#	"He still speaks it"

The examples above illustrate very graphically the tonal pattern of verbs in phrase medial position in the indicative, principal, present tense, positive conjugation - if there is at least one high tone on the penultimate syllable or to the left of it, then that high tone will surface on the penultimate

syllable, and all other high tones will delink. This tonal pattern comes about through the application of the rule that we termed Penult Shift.

5.4.2 Untoned Stems

(104) Examples:

a.	basémbâ #	"they still dig"
b.	basayímbâ #	"they still dig it"
c.	basába #	"they still distribute"
d.	basawába #	"they still distribute them"
e.	basakhétha #	"they still prefer"
f.	basayikhétha #	"they still prefer it"
g.	baselúka #	"they still knit"
h.	basalelúka #	"they still knit it"
i.	basaphendúla #	"they still answer"
j.	basayiphendúla #	"they still answer it"

We have met all the rules that apply to all the examples in (104).

Let us conclude this section by listing all the tone rules we have encountered so far:

(105) Tonal Rules

Lexical Rules

1. Right Branch Delink
2. Monosyllabic Lowering
3. Leftward Lowering
4. SP-Lowering
5. Participial Lowering
6. Leftward Spread
7. Extratonicity Marking
8. Rightward Shift
9. Removal of Extratonicity
10. Tone Simplification

Post-Lexical RulesPhrase Final Position

1. Prepausal Lengthening
2. High Dissimilation
3. Phrase Final Lowering
4. Tone Simplification

Phrase Medial Position

1. Penult Shift
2. Left Branch Delink
3. Phrase Medial Lowering
4. Tone Simplification

Phonetic Rules

1. Low Tone Default
2. Depressor Shift
3. Depressor Assimilation
4. Tone Simplification

6. Subjunctive Mood - Present Tense6.1 Introduction

In our discussion of the subjunctive, present tense, we shall discuss toned and untoned stems occurring without object prefixes, and thereafter we will discuss toned and untoned stems incorporating object prefixes. Other verbal prefixes do not occur in the subjunctive, present tense, excepting for the 'exhortative' /bô/ which occurs in what is sometimes referred to as the "Exhortative Subjunctive", but in that case the verb complement is the infinitive, occurring without the initial vowel of the infinitive prefix, while the basic prefix /ku/ also deletes in most environments. The main significance of this conjugation is that of exhorting someone or some people to do something at some future time.

(106) Examples:

- a. nibô:ku:yá ## "do go" (at some future time)
- b. abô:ku:dlǎ ## "he should please eat" (at some future time)
- c. babô:sebé:nzà ## "they should please work"
- d. nibô:hambâ ## "you should please leave"

SP-Lowering applies in all the examples, and thereafter the tonology is that of verb infinitives, which we have already studied.

The other subjunctive 'tense' is what some term the past subjunctive while others argue that it is not a subjunctive at all, but a "narrative" tense of the indicative, principal sub-mood. The latter group take their stand from the fact that structurally this tense is indicative, principal, i.e. subject prefixes, terminating vowel etc. are those of the indicative, principal sub-mood. The tonology also is similar to that of the indicative principal present tense, with Penult Shift also applying phrase medially in the construction. Here is a past subjunctive paradigm:

(107) Examples:

a.	wâ:dlǎ ##	"and he ate"
b.	wé:dlǎ #	"
c.	wá:lwa ##	"and he fought"
d.	wálwa #	"
e.	bé:ba ##	"and they stole"
f.	béba #	"
g.	ló:sa ##	"and it roasted"
h.	lósa #	"
i.	báphe:ka ##	"and they cooked"
j.	baphéka #	"
k.	bá ^l phú:zá ##	"and they drank"
l.	baphúzá #	"
m.	básebé:nzá ##	"and they worked"
n.	basebénzá #	"
o.	bahláku:la ##	"and they weeded"
p.	bahlakúla #	"

The other subjunctive (tense) is the present tense, which we shall discuss in the rest of this section.

6.2 Toned Stems in Phrase Final Position

(108) Examples:

- | | | |
|----|--------------------|----------------------|
| a. | ukúzé bá:fe ## | "so that they die" |
| b. | ukúzé bá:khe ## | "so that they build" |
| c. | ukúzé bángè:né## | "so that they enter" |
| d. | ukúzé bábo:né ## | "so that they see" |
| e. | ukúzé lésa:bé ## | "so that it fears" |
| f. | ukúzé basébe:nzé## | "so that they work" |

These examples clearly demonstrate what was stated in (100), viz. that the subject prefix in the positive subjunctive mood is exempt from Leftward Lowering. The subjunctive suffix, however, needs to be discussed for a while. Underlyingly, we think, this suffix is $\overset{H}{/e[+LSp]/}$, and we also think that it would simplify our understanding of Leftward Spread and Leftward Shift processes if all high toned verbal suffixes, monosyllabic and disyllabic, were classified as undergoing one or the other of these two processes. The suffixes then would have the following underlying representations:

(109) Examples:

- | | |
|----|--|
| a. | $\overset{H}{i}[+LSp]$ as in $/\acute{a}ng\acute{a}hlak\acute{u}: / < \overset{H}{a}\text{-}nga\text{-}hlakul\text{-}\overset{H}{i}[+LSp]$
"he should not weed" |
| b. | $\overset{H}{i}[+LSh]$ as in $/ak\acute{a}hlak\acute{u}:li/ < \overset{H}{a}\text{-}k\acute{a}\text{-}hlakul\text{-}\overset{H}{i}[+LSh]$
"he does not weed" |
| c. | $\overset{H}{il\acute{e}}[+LSp]$ as in $/\acute{e}hlakul\acute{i}:le/ < \overset{H}{\acute{e}}\text{-}hlakul\text{-}\overset{H}{il\acute{e}}[+LSp]$
"having weeded" |
| d. | $\overset{H}{ang\acute{a}}[+LSh]$ as in $ak\acute{a}hlakul\acute{a}nga < \overset{H}{a}\text{-}k\acute{a}\text{-}hlakul\text{-}\overset{H}{ang\acute{a}}[+LSh]$ |
| d. | $\overset{H}{ang\acute{a}}[+LSh]$ as in $ak\acute{a}hlakul\acute{a}nga < \overset{H}{a}\text{-}k\acute{a}\text{-}hlakul\text{-}\overset{H}{ang\acute{a}}[+LSh]$ |

In the case of the subjunctive suffix, Leftward Spread is blocked when the subject prefix occurs immediately before the radical:

(110) Examples:

- a. á'yíhlakû:le## but ahláku:lé##
 b. níbabô:ne## but níbo:né##
 c. báyikhulû:me## but bakhúlu:mé##

In order to account for this alternation, we formulate a rule that deletes the [+LSp] feature of the subjunctive suffix when the subject prefix immediately precedes the verbal radical.

(111) [+LSp] Deletion

$$[+LSp] \rightarrow \emptyset / \left[\begin{array}{c} (C) \\ SP \end{array} \right] V \left[\begin{array}{c} C \\ Stem \end{array} \right] (VC) \left[\begin{array}{c} H \\ V \\ - \end{array} \right] \begin{array}{l} \text{Suffix, Subjunctive,} \\ \text{Positive} \end{array}$$

This rule will be the first rule to apply whenever a verb in the positive subjunctive occurs with the subject prefix immediately preceding the verbal radical (i.e. when the verb occurs without the object prefix).

(112) Sample Derivations

$$\begin{array}{ccc} \left[\begin{array}{c} H \\ | \\ ba \end{array} \right] \left[\begin{array}{c} H \\ | \\ dlV \end{array} \right] \left[\begin{array}{c} H \\ | \\ e \end{array} \right] [+LSp] & & \left[\begin{array}{c} H \\ | \\ ba \end{array} \right] \left[\begin{array}{c} H \\ | \\ sebenzV \end{array} \right] \left[\begin{array}{c} H \\ | \\ e \end{array} \right] [+LSp] \\ \text{phrase} & & \text{phrase} \end{array}$$

$\begin{array}{c} H \quad H \\ | \quad | \\ badle \end{array}$

$\begin{array}{c} H \quad H \quad H \\ | \quad | \quad | \\ basebenze \end{array}$

Lexical Component

[+LSp] Deletion

$\begin{array}{c} H \quad H \\ | \quad | \\ badle \end{array}$

Tone Simplification

$\begin{array}{c} H \quad H \\ | \quad | \\ badle \end{array}$

Monosyllabic Lowering

-	$\begin{array}{ccc} H & H & H \\ & & \\ \text{basebenze} \end{array}$	Leftward Lowering
-	$\begin{array}{ccc} H & & H \\ & & \\ \text{basebe(nze)} \end{array}$	Extratonicity Marking
-	$\begin{array}{ccc} H & & H \\ & & \\ \text{basebe(nze)} \end{array}$	Rightward Shift
-	$\begin{array}{ccc} H & & H \\ & & \\ \text{basebenze} \end{array}$	Removal of Extratonicity
		<u>Postlexical Component</u>
	$\begin{array}{ccc} H & & H & H \\ & & & \\ \text{baadle} & & \text{basebeenze} \end{array}$	Prepausal Lengthening
		<u>Phonetic Component</u>
	$\begin{array}{ccc} \text{báádlè} & & \text{bàsébèènzé} \\ \text{báádlè} & & \text{bàsébèènzé} \end{array}$	Low Tone Default
		Depressor
		Assimilation

6.3 Toned Stems in Phrase Medial Position

(113) Examples:

- ukúzé bádílè #
- ukúzé bákhe #
- ukúzé bángène#
- ukúzé bábone #
- ukúzé lésabe #
- ukúzé basébenzé #

The lexical rules that apply are the same as those that applied in the phrase final position. In the post-lexical component, Phrase Medial Lowering applies to examples (c) to (f).

6.4 Untoned Stems in Phrase Final Position

(114) Examples:

- | | | |
|----|-------------------|-------------------------------|
| a. | ukúzé á:lwe ## | "So that he fights" |
| b. | ukúzé ó:se # | "So that he roasts" |
| c. | ukúzé aphé:ke## | "So that he cooks" |
| d. | ukúzé éla:phé ## | "So that he treats medically" |
| e. | ukúzé aqábu:lé ## | "So that he kisses" |

Monosyllabic Lowering applies in (114)(a) and (b), delinking the high tone originally associated with the suffix, while Rightward Shift applies in (114)(e). No lexical tone rule applies in (114)(d), except for [+LSp] Deletion, which applies as the first rule to all the examples in (114). The problem example is (114)(c). In this example, a high tone surfaces on the first syllable of the root. There are only two high tones in the underlying representation of this verb -- one associated with the prefix and the other associated with the suffix. The high tone surfacing on the root cannot be the original suffix tone because no Leftward Spread or Leftward Shift rule applies in this environment, and even if it did, there would be the problem of accounting for the missing subject prefix high tone. The possibility is that the high tone of the suffix has delinked, which has triggered Rightward Shift. The problem is how to account for this delinking. We believe that a special rule delinks the high tone in this environment in order to disambiguate the low CVCV verbal root in the subjunctive, from the segmentally indistinguishable verb in what is generally referred to as the imperative incorporating the object prefix.

(115) Examples:

- | | | |
|----|-------------------|----------------------|
| a. | ukúzé bahlé:ke ## | "So that they laugh" |
| b. | ukúzé bahléke # | " |
| c. | báhle:ké ## | "laugh at them" |
| d. | báhleke # | " |

Here are the underlying structures for the verbs in the two constructions:

(116)

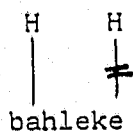
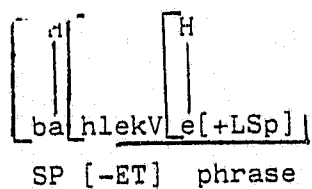
a. $\begin{bmatrix} H \\ | \\ [ba[hlek]e[+LSp] \end{bmatrix}$ "that they laugh"

b. $\begin{bmatrix} H \\ | \\ [u[ba[hlek]e[+LSp] \end{bmatrix}$ "(you) laugh at them!"

One of the significances of the present subjunctive is that of conveying polite commands, e.g. /ú¹báhle:ké/ is a polite way of conveying the command "laugh at them!" If, however, the subject prefix deletes, then the construction conveys an ordinary command (and that is the reason why many analysts mistake that construction for an "imperative, incorporating object prefix"). After the deletion of the subject prefix, then the forms in (116)(a) and (b) become segmentally and tonally identical i.e. each becomes ^H /bahleke/. The difference between the two forms is morphological i.e. the prefix /ba/ in the (116)(a) example is the subject prefix while in the (116)(b) example it is the object prefix. At this point, we claim, a special rule applies which maintains the distinction by delinking the high tone from /e/ in the verb preceded by the subject prefix. This morphologically conditioned rule we term /e/ High Delink.

(117) /e/ - High Delink

$\begin{bmatrix} H \\ | \\ [(C) V [C V C V [\begin{matrix} H \\ \neq \\ e[+LSp] \end{matrix} \end{bmatrix}$
 SP root Subjunctive Suffix

(118) Sample DerivationLexical Component

/e/- High Delink



Rightward Shift

Postlexical Component

Prepausal Lengthening

Phonetic Component

bàhléékè

Low Tone Default

"that they laugh"

6.5 Untoned Stems in Phrase Medial Position

(119) Examples:

- | | | |
|----|-----------------|-------------------------------|
| a. | ukúzé álwe # | "So that he laughs" |
| b. | ukúzé óse # | "So that he roasts" |
| c. | ukúzé baphéke # | "So that they work" |
| d. | ukúzé élaphe # | "So that he treats medically" |
| e. | ukúzé aqábule # | "So that he kisses" |

Phrase Medial Lowering applies in (119(d) and (e), and that is the essential difference between these verbs and those in (114).

6.6 Toned Stems with Object Prefixes - Phrase Final Position

(120) Examples:

- | | | |
|----|---------------------|--------------------------|
| a. | ukúzé ámû:phe ## | "So that he gives him" |
| b. | ukúzé ba'yâ:khe ## | "So that they build it" |
| c. | ukúzé ábabô:ne ## | "So that he sees them" |
| d. | ukúzé ábuphû:zê ## | "So that he drinks it" |
| e. | ukúzé ámesâ:be ## | "So that he fears him" |
| f. | ukúzé ábadubû:le ## | "So that he shoots them" |

In examples (12)(a), (b), (c), (d) and (e), Leftward Lowering and Leftward Spread have applied. Leftward Spread applies because [+LSp] Deletion does not apply here.

6.7 Toned Stems with Object Prefixes - Phrase Medial Position

(121) Examples:

- | | | |
|----|------------------|--------------------------|
| a. | ukúzé ámuphê # | "So that he gives him" |
| b. | ukúzé báyakhe # | "So that they build it" |
| c. | ukúzé ábabone # | "So that he sees them" |
| d. | ukúzé ábuphuzê # | "So that he drinks it" |
| e. | ukúzé ámesabe # | "So that he fears him" |
| f. | ukúzé ábadùbule# | "So that he shoots them" |

The derivations of these verbs are similar to those of the phrase final position, the difference is only in the post-lexical rules that apply.

6.8 Untoned Stems with Object Prefixes

(122) Examples:

- | | | |
|----|-------------------|------------------------|
| a. | ukúzé áyi:lwé ## | "So that he fights it" |
| b. | ukúzé áyilwe # | " |
| c. | ukúzé áyo:sé ## | "So that he roasts it" |
| d. | ukúzé áyose # | " |
| e. | ukúzé á'búgêzê## | "So that he washes it" |
| f. | ukúzé á'búgêzè # | " |
| g. | ukúzé á'yélû:ke## | "So that he knits it" |
| h. | ukúzé á'yéluke # | " |

- i. ukúzê á'yíhlakú:le ## "So that he weeds it"
 j. ukúzê á'yíhlakule # "

We have met all the rules that apply in the examples in (122).

This concludes our discussion of verbs in the subjunctive mood positive.

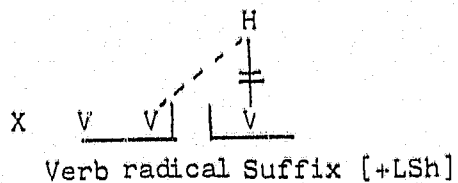
7. Negative Constructions

(123) Examples:

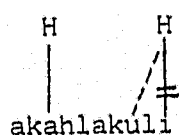
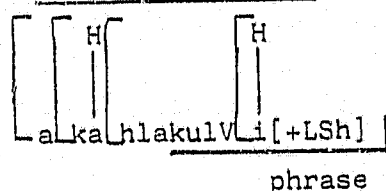
- a. úma éngáhlakú:li ## "If he doesn't weed" (Indicative, participial)
 b. ukúze ángáhlakú:li ## "So that he doesn't weed" (Subjunctive)
 c. ukúngáhlakú:li ## "Not to weed" (Infinitive)
 d. akáhlakú:li ## "He doesn't weed" (Indicative, principal)

The verbs above are negative forms of constructions whose tonology we have just studied. In (a), (b) and (c), the suffix is /i[+LSp]/, and in all three examples Leftward Spread has applied as expected. In example (123)(d), however, the suffix is /i[+LSh]/, i.e. it is a suffix that undergoes Leftward Shift, a rule we have not yet presented:

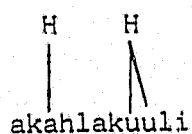
(124) Leftward Shift



The rule states that the high tone associated with a [+LSh] suffix spreads to the penultimate vowel of a polysyllabic verbal radical to its left and delinks from the suffix vowel.

(125) Sample DerivationLexical Component

Leftward Shift

Postlexical Component

Prepausal Lengthening

Phonetic Component

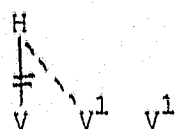
ākāhlākúúli

Low Tone Default

"he doesn't weed"

Negative constructions present no problems once the verbal suffixes have been properly classified as either [+LSp] or [+LSh], if they are toned. Essentially, for instance, there is no difference in the tonology of the negative present participial, the negative of the present subjunctive and the negative infinitive. All three negative constructions undergo Leftward Spread because they incorporate the negative suffix /-i[+LSp]/.

Before we conclude this section, we wish to point out that the occurrence of a [+LSp] or [+LSh] suffix blocks the application of Rightward Shift.

(126) Rightward Shift

1 2 3 (iterative with the rightmost H in the word)

where V¹ = a tonally unassociated vowel

Condition: The rule does not apply in a verbal complex incorporating a [+LSp] or [+LSh] suffix.

(127) Sample Derivation

a. $\begin{array}{c} \text{H} \quad \text{H} \\ | \quad | \\ \text{[a]ka[h]labeléV[i][+LSH]} \end{array}$

Lexical Component

$\begin{array}{c} \text{H} \quad \text{H} \\ | \quad / \\ \text{akahlabele'i} \end{array}$

Leftward Shift

Postlexical Component

etc.

akáhlabele'í

"he doesn't sing"

b. $\begin{array}{c} \text{H} \quad \text{H} \quad \text{H} \\ | \quad | \quad | \\ \text{[ba]yi[h]labeléV[e][+LSp]} \end{array}$

Lexical Component

$\begin{array}{c} \text{H} \quad \text{H} \quad \text{H} \\ | \quad | \quad / \\ \text{bayihlabele'e} \end{array}$

Leftward Spread

Postlexical Component

etc.

bá'yíhlabele:le

"they should sing it"

In sample derivation (127), it is the occurrence of a [+LSH] or [+LSp] suffix that blocks the application of Rightward Shift.

This brings our discussion of Zulu verb tonology to a conclusion. There are two major constructions that we have not discussed, viz. imperatives and the conditional or potential mood. There are, however, no new rules that apply in these constructions, and that is why they have been left out.

8. Summary of Tone Rules

What type of rules have we come across in this concluding chapter? Prepausal Lengthening (9) to start with, is not a tone rule, but an intonational rule, while Tone Simplification (55),

(68) is more of a Wellformedness condition that applies whenever required. Low Tone Default(1), Depressor Assimilation (63) and Depressor Shift (64) are all phonetic rules in the sense defined in the introduction to this chapter, i.e. they are rules that affect high and low tones; and vowels and consonants. The remaining rules are phonological rules, i.e. rules that affect high tones and vowels only, and to which consonants are invisible.

Some phonological rules are restricted in their application to one or two morphemes or constructions while others have a very general domain of application. We shall refer to the latter as general phonological rules. As we indicated in the introduction, phonological rules are of two types, lexical and post-lexical. Of the lexical tone rules of Zulu, Monosyllabic lowering (86) (which applies to monosyllabic verbs only); /e/- High Delink (117) and [+LS-] Deletion (111) (which apply to the subjunctive suffix only); Right Branch Delink (14) (which converts double linked high toned CVCV verbal radicals to single-linked high-toned radicals); SP-Lowering (78) and Participial Lowering (79), (which apply to a few verbal prefixes only) are, in their application, highly restricted. One of the postlexical rules, viz. Penult Shift (93) is also restricted; it applies only in the phrase medial position of the indicative, principal sub-mood and in the past subjunctive. This leaves us with eight general tone rules - four lexical and four postlexical.

(128) Lexical Tone Rules

- a. Leftward Lowering
- b. Leftward Shift
- c. Leftward Spread
- d. Rightward Shift

Leftward Lowering applies before either Leftward Spread or Leftward Shift as it feeds each of these rules:

(129) Sample Derivations:

$\begin{bmatrix} H \\ | \\ e \end{bmatrix} \begin{bmatrix} H \\ | \\ n \end{bmatrix} \begin{bmatrix} H \\ | \\ g \end{bmatrix} \begin{bmatrix} H \\ | \\ a \end{bmatrix} \begin{bmatrix} H \\ | \\ s \end{bmatrix} \begin{bmatrix} H \\ | \\ e \end{bmatrix} \begin{bmatrix} H \\ | \\ b \end{bmatrix} \begin{bmatrix} H \\ | \\ e \end{bmatrix} \begin{bmatrix} H \\ | \\ n \end{bmatrix} \begin{bmatrix} H \\ | \\ z \end{bmatrix} \begin{bmatrix} H \\ | \\ i \end{bmatrix} \begin{bmatrix} H \\ | \\ + \end{bmatrix} \begin{bmatrix} H \\ | \\ L \end{bmatrix} \begin{bmatrix} H \\ | \\ S \end{bmatrix} \begin{bmatrix} H \\ | \\ p \end{bmatrix}$
 $\begin{bmatrix} H \\ | \\ a \end{bmatrix} \begin{bmatrix} H \\ | \\ k \end{bmatrix} \begin{bmatrix} H \\ | \\ a \end{bmatrix} \begin{bmatrix} H \\ | \\ s \end{bmatrix} \begin{bmatrix} H \\ | \\ e \end{bmatrix} \begin{bmatrix} H \\ | \\ b \end{bmatrix} \begin{bmatrix} H \\ | \\ e \end{bmatrix} \begin{bmatrix} H \\ | \\ n \end{bmatrix} \begin{bmatrix} H \\ | \\ z \end{bmatrix} \begin{bmatrix} H \\ | \\ i \end{bmatrix} \begin{bmatrix} H \\ | \\ + \end{bmatrix} \begin{bmatrix} H \\ | \\ L \end{bmatrix} \begin{bmatrix} H \\ | \\ S \end{bmatrix} \begin{bmatrix} H \\ | \\ h \end{bmatrix}$

$\begin{bmatrix} H \\ | \\ e \end{bmatrix} \begin{bmatrix} H \\ | \\ n \end{bmatrix} \begin{bmatrix} H \\ | \\ g \end{bmatrix} \begin{bmatrix} H \\ | \\ a \end{bmatrix} \begin{bmatrix} H \\ | \\ s \end{bmatrix} \begin{bmatrix} H \\ | \\ e \end{bmatrix} \begin{bmatrix} H \\ | \\ b \end{bmatrix} \begin{bmatrix} H \\ | \\ e \end{bmatrix} \begin{bmatrix} H \\ | \\ n \end{bmatrix} \begin{bmatrix} H \\ | \\ z \end{bmatrix} \begin{bmatrix} H \\ | \\ i \end{bmatrix} \begin{bmatrix} H \\ | \\ + \end{bmatrix} \begin{bmatrix} H \\ | \\ L \end{bmatrix} \begin{bmatrix} H \\ | \\ S \end{bmatrix} \begin{bmatrix} H \\ | \\ p \end{bmatrix}$
 engasebenzi

$\begin{bmatrix} H \\ | \\ a \end{bmatrix} \begin{bmatrix} H \\ | \\ k \end{bmatrix} \begin{bmatrix} H \\ | \\ a \end{bmatrix} \begin{bmatrix} H \\ | \\ s \end{bmatrix} \begin{bmatrix} H \\ | \\ e \end{bmatrix} \begin{bmatrix} H \\ | \\ b \end{bmatrix} \begin{bmatrix} H \\ | \\ e \end{bmatrix} \begin{bmatrix} H \\ | \\ n \end{bmatrix} \begin{bmatrix} H \\ | \\ z \end{bmatrix} \begin{bmatrix} H \\ | \\ i \end{bmatrix} \begin{bmatrix} H \\ | \\ + \end{bmatrix} \begin{bmatrix} H \\ | \\ L \end{bmatrix} \begin{bmatrix} H \\ | \\ S \end{bmatrix} \begin{bmatrix} H \\ | \\ h \end{bmatrix}$
 akasebenzi Lexical Component
 Leftward Lowering

$\begin{bmatrix} H \\ | \\ e \end{bmatrix} \begin{bmatrix} H \\ | \\ n \end{bmatrix} \begin{bmatrix} H \\ | \\ g \end{bmatrix} \begin{bmatrix} H \\ | \\ a \end{bmatrix} \begin{bmatrix} H \\ | \\ s \end{bmatrix} \begin{bmatrix} H \\ | \\ e \end{bmatrix} \begin{bmatrix} H \\ | \\ b \end{bmatrix} \begin{bmatrix} H \\ | \\ e \end{bmatrix} \begin{bmatrix} H \\ | \\ n \end{bmatrix} \begin{bmatrix} H \\ | \\ z \end{bmatrix} \begin{bmatrix} H \\ | \\ i \end{bmatrix} \begin{bmatrix} H \\ | \\ + \end{bmatrix} \begin{bmatrix} H \\ | \\ L \end{bmatrix} \begin{bmatrix} H \\ | \\ S \end{bmatrix} \begin{bmatrix} H \\ | \\ p \end{bmatrix}$
 engasebenzi

- Leftward Spread

$\begin{bmatrix} H \\ | \\ a \end{bmatrix} \begin{bmatrix} H \\ | \\ k \end{bmatrix} \begin{bmatrix} H \\ | \\ a \end{bmatrix} \begin{bmatrix} H \\ | \\ s \end{bmatrix} \begin{bmatrix} H \\ | \\ e \end{bmatrix} \begin{bmatrix} H \\ | \\ b \end{bmatrix} \begin{bmatrix} H \\ | \\ e \end{bmatrix} \begin{bmatrix} H \\ | \\ n \end{bmatrix} \begin{bmatrix} H \\ | \\ z \end{bmatrix} \begin{bmatrix} H \\ | \\ i \end{bmatrix} \begin{bmatrix} H \\ | \\ + \end{bmatrix} \begin{bmatrix} H \\ | \\ L \end{bmatrix} \begin{bmatrix} H \\ | \\ S \end{bmatrix} \begin{bmatrix} H \\ | \\ h \end{bmatrix}$
 akasebenzi Leftward Shift
Postlexical Component

etc.

etc.

éngàsebê:nzi

akasebé:nzi

"(he) not working"

"he doesn't work"

Sample derivation (48) demonstrated that Leftward Spread must precede Rightward Shift and also that Leftward Lowering must precede Rightward Shift as the former fed the latter in that sample derivation. Since Leftward Spread and Leftward Shift are mutually exclusive, the order of application of our general tone rules is:

(130) Rule Order

- Leftward Lowering
- Leftward Spread/Leftward Shift
- Extratonicity Marking
- Rightward Shift
- Removal of Extratonicity

(Extratonicity Marking and Removal of Extratonicity are, strictly speaking, not tone rules, but they are devices that ensure the correct application of Rightward Shift, and of rules that follow.)

(131) Post-Lexical Rules

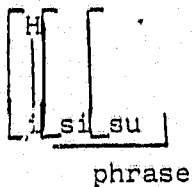
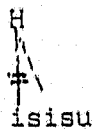
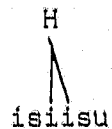
<u>Phrase Final</u>	<u>Phrase Medial</u>
1. High Dissimilation	3. Left Branch Delink
2. Phrase Final Lowering	4. Phrase Medial Lowering

Phrase Final Lowering applies after High Dissimilation, otherwise it would bleed it, just as Phrase Medial Lowering applies after Left Branch Delink, otherwise it also would bleed Left Branch Delink by dissolving the double-linking.

Of these eight general phonological rules, three are, in their application, restricted to verbs, viz. Leftward Lowering, Leftward Shift and Leftward Spread. The other five rules are the same main rules that apply in noun tonology. Non-phonological tone rules such as phonetic tone rules, and rules such as Tone Simplification apply whenever and wherever required. Here are some sample derivations that illustrate the application of these rules in noun tonology:

(132) Sample Derivations:

a.

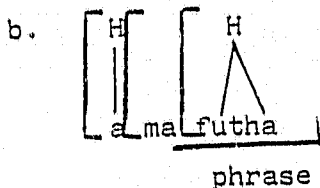
Lexical ComponentPostlexical ComponentPhonetic Component

isísu

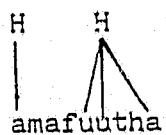
Low Tone Default

isí:su

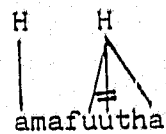
"stomach"



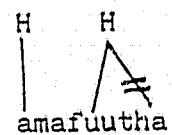
Postlexical Component



Prepausal Lengthening



High Dissimilation



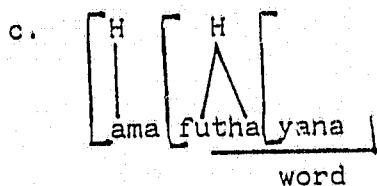
Phrase Final Lowering

Phonetic Component

ámàfúùthà

Low Tone Default

ámáfû:tha "fat, oil"



Lexical Component

ámáfúth(á)yana

Diminutive Delink

ámáfúthýana

Vowel Deletion

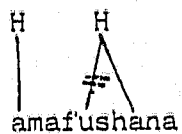
ámáfúshýana

Alveolar Palatalization

ámáfúshána

Y-Deletion

Postlexical Component



Left Branch Delink

Phonetic Component

ámàfùshána

Low Tone Default

ámáfushána "fat, oil (dim.)"

d.	$\left[\begin{array}{c} H \\ \text{ama bhakede} \end{array} \right]$	phrase	<u>Lexical Component</u>
	$\begin{array}{c} H \\ \\ \text{amabhake(de)} \end{array}$		Extratonicity Marking
	$\begin{array}{c} H \\ \swarrow \\ \text{amabhake(de)} \end{array}$		Rightward Shift
	$\begin{array}{c} H \\ \\ \text{amabhakede} \end{array}$		Removal of Extratonicity <u>Postlexical Component</u>
	$\begin{array}{c} H \\ \\ \text{amabhakeede} \end{array}$		Prepausal Lengthening <u>Phonetic Component</u>
	àmàbhàkèèèè		Low Tone Default
	àmàbhàkèèèè		Depressor Shift
	àmàbhàkèèèè		Low Tone Default
	àmàbhàkèèèè		Tone Simplification
	àmàbhàkèèèè		Depressor Assimilation

9. Concluding Remarks

9.1 Areas for Further Research

This study has been exploratory, employing a number of modern theoretical frameworks for explaining Zulu phonology. It has clearly identified a number of fields where intensive research would help shed a better light on Zulu segmental and tonal phenomena. One such field is that of Zulu dialects. The only study of Zulu dialects we know of is Kubeka (1979). That,

however, is an incomplete study since it omits the area of the greatest significance in the dialects viz. the tonology. We know, for instance, that one of the most striking differences between the KwaZulu and Natal Coast dialects is in what we explain through the notion of Extratonicity.

(133)

KwaZulu Dialects	Natal Coast Dialects	Underlying Structure
a. ehlabélela	ehlabélela	$\begin{array}{ c c c c } \hline H & & & \\ \hline & & & \\ \hline e & hlab & e & l e l a \\ \hline \end{array}$
b. ekhulúmisa	ekhulumisa	$\begin{array}{ c c c c } \hline H & & H & \\ \hline & & & \\ \hline e & khulum & i & s a \\ \hline \end{array}$
c. ekhulumísana	ekhulumisána	$\begin{array}{ c c c c } \hline H & & H & \\ \hline & & & \\ \hline e & khulum & i s a n a \\ \hline \end{array}$

In the KwaZulu dialects - in our analysis - Extratonicity Marking applies to all polysyllabic verb stems (excluding, of course, the tonally unassociated CVCV stems immediately preceded by SP/OP), while in the Natal Coast dialects Extratonicity Marking does not apply to verb stems associated with a high tone. That is the reason why Rightward Shift applies in the same manner to the underlyingly tonally unassociated example in (133)(a), but differently to the underlyingly tonally associated examples in (133)(b) and (c).

We also know that morphemes occurring with the high-low tone clusters sometimes distinguish the two clusters of dialects:

(134) KwaZulu dialects	Natal Coast dialects
ú'kô:na	úko:ná "to spoil, sin"
ú'kwê:ba	úkwe:bá "to steal"
úkubô:na	úkubó:na "to see"
úkufû:na	úkufú:na "to want"

The problem is that we have no study that can tell us for certain which of the many dialects of Zulu (six are identified in Kubeka (1979)) employ one or the other of the pronunciations of dialect clusters provided in (133) and (134).

In segmental phonology more research has to be conducted on depression occurring on segments that are not regular depressors. A lot of variation attends the occurrence of the feature [+depressed] in such segments. Some of this variation was hinted at in Khumalo (1981), and in this analysis:

(135) KwaZulu dialects

lési, léso le:siyā
 "this" "that" "that yonder"
 báďála, síďe
 "they are old" "it is tall"

Natal Coast dialects

l^hési l^héso l^he:siyā:
 i.e. 1st, 2nd & 3rd position demonstratives
 báďála síďe
 (de-adjectival copulatives)

This variation is also not examined in Kubeka (1979). These are only two in a number of fields in segmental and tonal phonology that call for indepth research.

9.2 Tonal Analysis

Although some unresolved problems still remain, we feel that this study has gone a long way towards presenting a clearer picture of Zulu tonology.

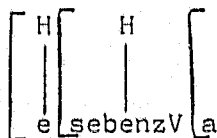
9.2.1 Leftward Lowering

We believe that a number of alternations where the leftmost of two adjacent high toned morphemes loses its high tone are best explained in terms of what in Khumalo (1981) was referred to as the dominance hierarchy. In some of the examples below, for instance, the high tone associated with the underlined morpheme delinks since the high toned morpheme to

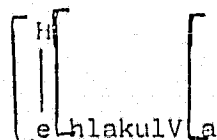
its immediate right has a higher ranking. (In this ranking, a prefix is lower than a root, which is lower than a suffix).

(136) Examples:

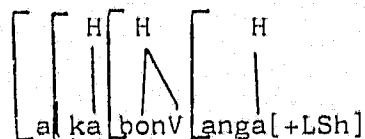
a. úma esebénza



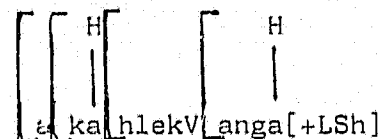
b. úma ehlákula



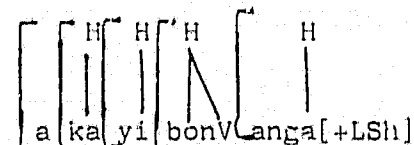
c. akabonángà



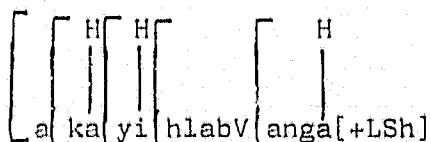
d. akáhlekángà



e. akáyibonángà



f. aká'yíhlabángà



While it is true that the principle of the dominance hierarchy supplies a possible explanation of the alternations above, yet there are unresolved problems concerning the formulation and application of the rule. How does one account for the exceptions, e.g. the failure of Leftward Lowering to apply to the positive subject prefixes in the indicative principal and subjunctive; its failure to apply to an object prefix preceded by /nga/?

9.2.2 Other Phonological Rules

Of the other phonological rules presented in this study, only one had previously been suggested. We are here referring to Rightward Shift which in different formulations appears in Khumalo (1981), Laughren (1984) and Clark (forthcoming). Leftward Shift and Leftward Spread, we believe, are being presented for the first time. All our major postlexical rules - High Dissimilation; Phrase Final Lowering; Left Branch Delink; Phrase Medial Lowering have not been discussed before, and these are the rules that apply in almost all postlexical environments. Perhaps these rules constitute the one major step forward in our understanding of Zulu tonology.

9.2.3 Extratonicity

In earlier studies, e.g. Khumalo (1981) we had an Antepenult Shift rule that accounted for the location of the high tone in stems with three or more unassociated syllables. In almost all these cases, the high tone surfaces on the antepenultimate syllable of the root. We could not explain why the high tone should be located on this, of all syllables. Not until Pulleyblank (1983) suggested that extrametricality has its tonal counterpart in extratonicity, i.e. that the syllable on the periphery of certain roots is "invisible" to specified tone rules. Using this principle, the Antepenult Shift rule is done away with and Rightward Shift instead applies more generally. The "invisibility" of the final syllable of a polysyllabic stem to Rightward Shift, explains why the high tone lands on the ante-penultimate syllable instead of on the expected penultimate syllable. But there are a number of artificial situations that arise which further research may clarify.

9.3 The Autosegmental Framework

Finally, we feel that it is the autosegmental framework that made our task of describing Zulu phonology that much easier. In the segmental description, for instance, we do not

see how, using a linear framework, we would have been able to formalize rules such as the Palatalization rule, where a bilabial stop sheds its point of articulation features and assimilates to those of an adjacent palatal glide.

In our tonal description also, the autosegmental framework enabled us to represent and distinguish between such rules as Rightward Shift, Leftward Shift and Leftward Spread. In fact, the autosegmental framework has enabled us to present a unified segmental and tonal analysis of Zulu phonology.

NOTES TO CHAPTER 5

1. "Obligatory Contour Principle (Leben): At the melodic level of the grammar, any two adjacent tonemes must be distinct. Thus HHL is not a possible melodic pattern; it automatically simplifies to HL" (Goldsmith 1976: 36). In our analysis, the tonal sequence HH may only occur where each tone is associated with a different morpheme.
2. A verbal radical differs from a verbal root in that the former may incorporate one or more verbal extensions, e.g. /bon/ "see", /bonis/ "show", /bonel/ "see for", /bonisel/ "direct" etc. In the preceding examples, /bon/ is sometimes referred to as the "base" or unextended radical, the others are termed extended radicals. A verbal root, therefore, may be considered a base or unextended verbal radical.
3. A doubly-linked high tone is the underlying representation for the phonetic high-low tone cluster that surfaces in the phonetic forms of these radicals. In Khumalo (1981), this tonal class of verbal radicals is referred to as the HH class. In the present analysis, the Obligatory Contour Principle collapses these two high tones into one doubly-linked high tone.
4. Dialectal variation here occurs only where Rightward Shift applies once, i.e. where the high tone on the initial vowel shifts one to the right. The spread of the high tone one to the right also causes dialectal variation in stems/radicals where the initial syllable is associated with a high tone:

<u>Dialect A</u>	<u>Dialect B</u>	
úkuhámba	úkú' hámba	"to go"
ísitúlo	ísí' túlo	"chair"
ábafána	ábá' fána	"boys"
ámakhôsi	ámá' khôsi	"chiefs"
báyahámba	báyá' hámba	"They are leaving"

NOTES TO CHAPTER 5

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ábafána	ábá fána	"boys"
ámakhôsi	ámá khôsi	"chiefs"
yahámba	báyá hámba	"They are leaving"

In dialect B, the high tone shifts one to the right even though the next vowel to the right is tonally associated.

5. After introducing Leftward Shift, we will claim that the correct underlying structure for this suffix is - ^Hanga[+LSH].
6. After introducing Leftward Spread, we will claim that the correct underlying structure for this suffix is - ^Hile[+LSp].
7. Khumalo (forthcoming), Leftward Ho! in Zulu Tonology, South African Journal of African Languages.
8. The high-low tone cluster surfacing in the verbal radical indicates that the radical is either in the infinitive or in the indicative participial sub-mood, otherwise Right Branch Delink would have applied. (see (14)).
9. The subject prefix /e/ is a 'participial' subject prefix, its 'principal' counterpart is /u/.
10. In some dialects the initial syllable of this ideophone is not associated with a high tone
11. This is a bimoric vowel, i.e. one segment linked to two 'V' slots. We are using two vowels here and elsewhere to represent two moras.
12. This step presents a bit of a problem. The segmental vowel to the left deletes as expected, but the vowel to the right then surfaces with the bimoric quality of the deleted vowel. We are not sure how to explain this.
13. The prefix /(m)a/ occurring in the present subjunctive in forms such as /makáhambé/ - "let him go" is referred to as a 'hortative' prefix in some studies.

APPENDIXTenses of the Verb

Traditionally, the verb stem is described as undergoing the following inflections in the negative and positive conjugations:

1. Imperative
2. Infinitive
3. Indicative Mood
4. Subjunctive Mood, and
5. Conditional Mood, which Doke (1927) terms the potential mood.

1. The Imperative

The imperative morpheme is a floating high tone which surfaces either on the final syllable of the verb stem or which shifts onto the penultimate syllable. It shifts to the penultimate syllable of polysyllabic verb stems, but is blocked from shifting onto the penultimate syllable of tonally unassociated disyllabic stems.

Examples:

a. $\left[\begin{array}{c} \left[\begin{array}{c} \left[\begin{array}{c} \text{yi} \end{array} \right] \left[\begin{array}{c} \text{dlV} \end{array} \right] \left[\begin{array}{c} \text{a} \end{array} \right] \end{array} \right] \begin{array}{c} \text{H} \\ | \\ \end{array} \left[\begin{array}{c} \text{H} \end{array} \right] \end{array} \rightarrow \text{yidlǎ} \quad \text{"eat!"}$

b. $\left[\begin{array}{c} \left[\begin{array}{c} \left[\begin{array}{c} \text{yi} \end{array} \right] \left[\begin{array}{c} \text{lwV} \end{array} \right] \left[\begin{array}{c} \text{a} \end{array} \right] \end{array} \right] \begin{array}{c} \text{H} \\ | \\ \end{array} \left[\begin{array}{c} \text{H} \end{array} \right] \end{array} \rightarrow \text{yilwá} \quad \text{"fight!"}$

c. $\left[\begin{array}{c} \left[\begin{array}{c} \left[\begin{array}{c} \text{hlekV} \end{array} \right] \left[\begin{array}{c} \text{a} \end{array} \right] \end{array} \right] \begin{array}{c} \text{H} \\ | \\ \end{array} \left[\begin{array}{c} \text{H} \end{array} \right] \end{array} \rightarrow \text{hleká} \quad \text{"laugh!"}$

d. $\left[\begin{array}{c} \left[\begin{array}{c} \left[\begin{array}{c} \text{hambV} \end{array} \right] \left[\begin{array}{c} \text{a} \end{array} \right] \end{array} \right] \begin{array}{c} \text{H} \\ | \\ \end{array} \left[\begin{array}{c} \text{H} \end{array} \right] \end{array} \rightarrow \text{hámǎ} \quad \text{"go!"}$

e. $\left[\begin{array}{c} \text{H} \\ | \\ \text{sebenzV} \end{array} \right] \left[\begin{array}{c} \text{H} \\ | \\ \text{a} \end{array} \right] \rightarrow \text{sebénza} \quad \text{"work!"}$

f. $\left[\begin{array}{c} \text{H} \\ | \\ \text{hlakulV} \end{array} \right] \left[\begin{array}{c} \text{H} \\ | \\ \text{a} \end{array} \right] \rightarrow \text{hlakúla} \quad \text{"weed!"}$

The negative of the infinitive is *musa(ni)* + infinitive e.g.

músa úkudlă "don't eat!" (singular)

musáni úkudlă "don't eat!" (plural)

2. The infinitive has been discussed at length in the body of the thesis.

3. The Indicative Mood

The indicative mood comprises a 'principal' and 'participial' submood. The morphemes that occur in the different tenses are the following:

a. Subject Prefix (SP) (see Doke (1927) : 289)

In the 'principal' submood the subject prefixes of the first and second persons (singular and plural) are tonally unassociated (and are associated with the feature [depressed], while those of the other classes, like all those occurring in the 'participial' submood (SP^D) and in the subjunctive mood (SP^S) are underlyingly associated with a high tone. (Subject prefixes occurring in the conditional mood (SP^C) are tonally unassociated.)

b. Present Tense Prefix (PT)

A present tense prefix /ya/ occurs immediately after the subject prefix if the verb is not followed by an adjunct. The prefix /ya/, which occurs in the positive conjugation only, is tonally unassociated.

c. Tense Suffix (TS)

The verbal radical (R) is usually followed by a tense suffix, which is a vowel and in some cases tonally unassociated, while in others, especially in the negative conjugation, it is associated with a high tone.

d. Past Tense Morpheme (Past)

The past tense morpheme /be/ is tonally unassociated.

e. Remote Past Tense Morpheme (RP)

The remote past tense morpheme /â:/, is a bimoric vowel whose first mora is associated with a high tone.

f. Progressive Morpheme (Pro)

The progressive aspect morpheme /be/ occurs in the so-called 'future continuous' tenses e.g. /úzobe esebenza/ 'he will be working', and in some remote past tenses e.g. /wâbe esebénza/ or (after it deletes) /wâ : yesebenza/ 'he was (in remote time) working'. Both the past tense morpheme /be/ and the progressive aspect morpheme /be/ seem to derive from underlying deficient verbs, since they, like some regular deficient verbs, govern 'participial' complements.

g. Future Morpheme (Fut)

The future morphemes are /zo/ and /yo/. In the speech of some Zulus /zo/ has an 'immediate future' significance while /yo/ has a 'remote future' significance, but in the speech of most Zulus /yo/ is falling out of usage. Both /zo/ and /yo/ are tonally unassociated and both condition infinitive complements. This infinitive complement comprises the infinitive prefix (IP) /ku/ and the verbal radical (R).

h. Perfect Aspect Morpheme (Perf.)

Traditionally, /ile/ is viewed as the suffix which in the present analysis would be considered the perfect aspect morpheme. In most present day analysis of tense and aspect, we believe that /ile/ would be considered to consist in the perfect aspect morpheme /il/ and the tense

suffix /e/ (cf. Johnson (1977)), where the perfect aspect morpheme of Kikuyu is /it/, and /e/ is the terminating suffix e.g.

ni a - ra - ruar - it e

he - NP - R MPerf. "he had been sick"

The final vowel i.e. /e/ is, in some conjugations, tonally unassociated, but in others it is associated with a [+LSpr] high tone e.g.

$\begin{bmatrix} H \\ | \\ u \end{bmatrix} \begin{bmatrix} \\ \\ lwV \end{bmatrix} \begin{bmatrix} \\ \\ ile \end{bmatrix}$ or $\begin{bmatrix} H \\ | \\ u \end{bmatrix} \begin{bmatrix} \\ \\ lwV \end{bmatrix} \begin{bmatrix} \\ \\ il \end{bmatrix} \begin{bmatrix} \\ \\ e \end{bmatrix}$ - úlwile "he fought"
('principal' sub-mood)

$\begin{bmatrix} H \\ | \\ e \end{bmatrix} \begin{bmatrix} \\ \\ lwV \end{bmatrix} \begin{bmatrix} H \\ | \\ ile \end{bmatrix}$ or $\begin{bmatrix} H \\ | \\ e \end{bmatrix} \begin{bmatrix} \\ \\ lwV \end{bmatrix} \begin{bmatrix} \\ \\ il \end{bmatrix} \begin{bmatrix} H \\ | \\ e \end{bmatrix} + [LSpr]$ - (úma)élwile ("if)
he fought"
(participial sub-mood)

Let us now illustrate how these morphemes combine in a paradigm of tenses in the indicative, principal sub-mood, positive conjugation. In the paradigm, we have used the term scative to distinguish the special interpretation of the perfect aspect marker in its occurrence with inchoative verbs:

		Simple	ngi-ya-hlek-a - ngiyahléka	"I laugh or
		SP-PTP-R	-	I am laughing"
1. PRESENT	Past	u-be-e-hlek-a - ubehléka	"he was laughing"	
		SP-Past-SP ^P -R	-	
	Remote Past	u-â : -(be)-e-hlek-a - wâbe ehléka or		
		SP-RP-(Pro)-SP ^P -R	wâyehléka	"he was laughing"(remote)

Simple ngi-zo-hlek-a - ngizohleka "I will laugh"
SP-Fut-R-

2. FUTURE

Past ngi-be-ngi-zo-hlek-a - beng^yzohleka "I
SP-be-SP^p-Fut-R laugh/I would have
laughed"

ngi-â:-(be)-ngi-zo-hlek-a - ngā:ng^yzohleka
Remote Past SP-RP-(Prog)-SP^p-Fut-R "I would laugh/
I would have laughed" (remote)

Simple ngi-hlek-il-e - ngihlekile "I laughed/I
SP-R-Perf. laughed"

3.a.PERFECT

Past ngi-be-ngi-hlek-il-e bengihlékile "I had
SP-Past-SP^p-R-Perf. laughed"

Remote Past ngi-â:-(be)-ngi-hlek-il-e - ngā:ngihlékile
"I had laughed" (remote)

Simple ngi-lamb-il-e - ngilambile "I am hungry"
SP-R-Perf.

b.STATIVE

Past ngi-be-ngi-lamb-il-e - bengilámBILE
SP-Past-SP^p-R-Perf. "I was hungry"

Remote Past ngi-â-ngi-lamb-il-e - ngāngilámBILE "I
was hungry" (remote)

4. REMOTE PAST

ngi-â : - hlek-a - ngā:hleká "I laughed"
(remote)
SP-RP - R -

The subjunctive and conditional moods have fewer tenses which are also analysable in the same manner in which we treated tenses of the indicative, principal, submood. Those requiring further information may consult Doke (1927 : 184-197 and Khumalo (1982), Chapter 3. For a fuller understanding of the tense paradigm Comrie (1976), (1985), and Johnson (1977) may be consulted.

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