

ABSTRACT

THE COMPARATIVE TONOLOGY OF SOUTHWESTERN MANDE NOMINALS

By

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This thesis is concerned with the tonology of Southwestern Mande (SWM) nominals. It begins with a discussion of the tonal phenomena which are of particular concern to the study of Southwestern Mande nominals: downdrift, downstep, and the phonological representation of contour tones. In this discussion, it is shown that these phenomena can be described with existing, though slightly modified phonological features.

A survey of the phonological and syntactic properties of the SWM nominals then follows. In this survey, the diachronic development of SWM consonant mutation is shown to have originated as the result of the interaction of morpheme-final nasals with following morpheme-initial consonants.

Grammars describing the tonal behavior of selected nominal constructions of each of the five SWM languages (Mende, Loko, Bandi, Loma, and Kpelle) appear in the next five chapters. These grammars are for the most part synchronically motivated, but in those situations where the synchronic evidence appeared insufficient for the determination of a unique grammar, a description using

natural rules and underlying representations based on the historical situation was provided. The question of the abstractness and naturalness of these synchronic grammars is further discussed in chapter 14 with the conclusion based on diachronic evidence that grammars with natural rules and underlying representations appeared to be in use in the earlier stages of SWM. But as the evidence necessary to construct these natural grammars disappeared in the later stages of SWM, less natural grammars using diacritic features began to emerge.

The second half of this thesis contains a comparative study of SWM which is fundamentally concerned with the diachronic development of the SWM tonal system. The discussion of the assumptions of the ways languages change (based on Kiparsky 1968 and King 1969) at the beginning of the diachronic portion of this thesis provides the basis for the reconstruction of the development of SWM tone rules and underlying tonal types given in the following two chapters. The reconstructed SWM tonal types are then compared with the tonal types of the Northern Mande languages and here it is demonstrated how a language with only two tonal levels can develop into a language with three tonal levels.

The unique process of tonal inversion in Loma is then presented. Here, it is shown how Loma rules and underlying tonal types are related to the rules and tonal types of Proto-Bandi-Loma, the immediate ancestor of Loma, through

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Tonal Inversion, a process which resulted in the tonal inversion of the feature 'high' in Loma tone rules and underlying representations.

6-24-68

Acknowledgements

I would like to acknowledge here the assistance that has been given me in writing this thesis. First, I would like to thank the following individuals who contributed specific information on one of the SWM languages: Mr. David Dolo (Kpelle), Mr. Alan Gobeh (Loma), Mr. Augustine Kamara (Bandi), Mr. Wilfred Kamara (Bandi), Mr. Fode Kamara (Loma), Dr. Lamin Kotu (Bandi), Mr. Samuel Lamin (Mende), Mrs. Kadi Lamin (Mende, Mr. Koli Malu (Loma), Mr. Harry Moniba (Bandi), and Mr. Alamamy Sesay (Loko).

I would also like to thank the following institutions: the Ford Foundation and the National Science Foundation for supporting the field research for this thesis, the Institute for African Studies, Fourah Bay College for making available their excellent facilities, the Holy Cross Mission, Bolahun, Liberia for accepting a self-invited guest and for making their facilities available, and to the people of Sierra Leone and Liberia for their hospitality and warmth.

I would also like to thank my committee chairman, Dr. Julia Falk, and the members of my committee, Dr. William Welmers, Dr. John Eulenberg, Dr. David Lockwood and Dr. Seok Song, for their valuable suggestions and

insights concerning the development and presentation of this thesis. I would especially like to thank my committee chairman, Dr. Julia Falk, not only for her invaluable assistance, suggestions, and criticisms concerning the theoretical content of this thesis, but for her advice and assistance in the areas of formal writing, editing, and proof-reading for which I am profoundly grateful. I would also like to thank and acknowledge the special assistance given me by Dr. William E. Welmers; he has provided me with a great deal of valuable information, insight, and understanding about the nature of West African languages.

I would also like to thank Mrs. Carmin Cadenas, Dr. Patrick Doyle, Mrs. Sherley Doyle, and Mrs. Anabel Dwyer for their assistance in typing and proof-reading the final draft of this thesis.

Finally, I would like to acknowledge my indebtedness to my friend, Dr. Meyer Wolf, my master's committee chairman for all that I have learned from him.

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Chapter 1

Introduction

The purpose of this diachronic study of the development of the Southwestern Mande (SWM) languages is to gain a better understanding of the tonal history of SWM, the development known as tone.

This investigation of SWM tone began with the field collection and analysis of the tonal behavior of the nominal phrases of the five Southwestern Mande languages: Mende, Loko, Bandi, Loma, and Kpelle. The results of these analyses are presented in chapters 4 through 8, following three introductory chapters. Chapter 1 presents the organization of this thesis, chapter 2 discusses the theoretical assumptions about tone and the way in which tone is analyzed and the way in which tone is treated throughout this thesis, and chapter 3 contains an overview of the linguistic properties of the SWM languages.

The individual tonal analyses were then compared and the tonal history of Southwestern Mande reconstructed. These results, which appear in chapter 10 (rules) and 11 (base forms), are preceded by a general discussion of the principles of diachronic linguistics upon which these reconstructions are based (chapter 9). Chapter 12 shows how a language with

two discrete tonal levels and two tonal classes (Proto-Northern-Western Mande) can develop into a language with three discrete tonal levels and five tonal classes (Proto-Southwestern Mande). Chapter 13 provides proof that Loma is a language which has undergone Tonal Inversion, and, finally, chapter 14 discusses the synchronic status of certain Southwestern Mande morpheme-final nasals.

The Southwestern Mande languages are spoken in the Republics of Guinea, Sierra Leone, and Liberia. These languages constitute one of the four major subfamilies of the Mande language family. Mande is one of the major subfamilies of Niger-Congo, and Niger-Congo is one of the two branches of the Niger-Kordofanian family (Greenberg 1963).

Within the Mande grouping, there is first a division between Northern-Western and Southern-Eastern Mande. The Northern-Western group further divides into Northern and Southern. The five Southwestern Mande languages are Mende, Loko, Bandi, Loma, and Kpelle. In Figure 1-1 below, any languages separated by a hyphen are to be interpreted as dialectal variants (e.g. Susu and Yalunka). Languages separated by a space are less closely related (e.g., Bandi and Loma), and those languages separated by a double space are more remotely related (e.g., Loma and Kpelle).

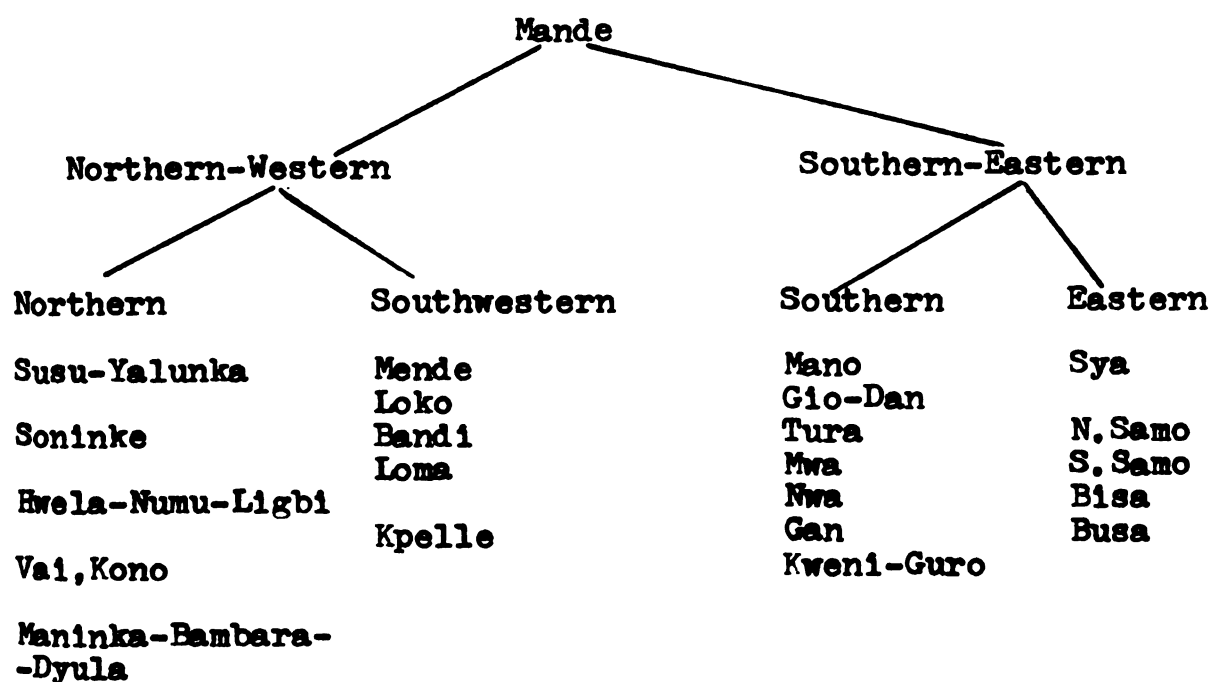


Figure 1-1: The Mande languages (based on Welmers 1958: 21)

Within the SWM languages, Mende, Loko, Bandi, and Loma comprise a closely knit group of languages, which I call Central Southwestern Mande. All of the Central SWM languages are clearly distinct from Kpelle and are so similar to each other that they could almost be considered to be dialects of the same language. Despite the rather different surface appearance of Loma, when compared to the other Central SWM languages, Loma is actually most closely related to Bandi, both having shared a period of common development apart from Mende and Loko.

The relationships described in the preceding paragraph are represented in Figure 1-2 of the following page. Figure 1-2 is further discussed in chapter 9.

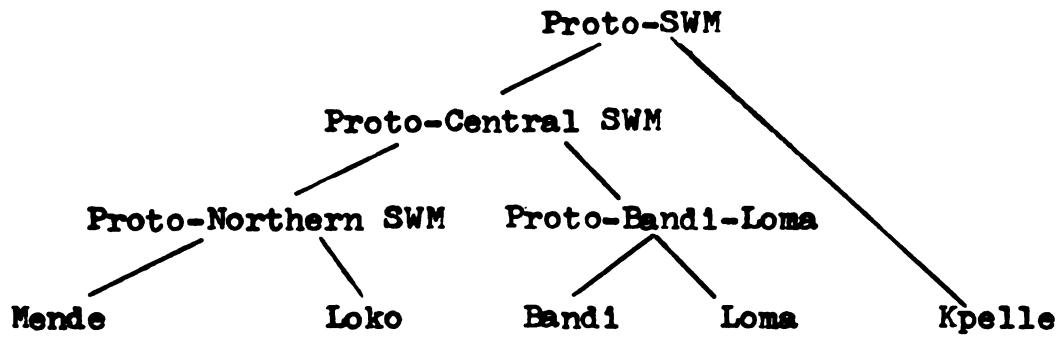


Figure 1-2: The Southwestern Mande languages.

Chapter 2

Tone

This chapter discusses three problems of tone representation crucial to the analysis of Southwestern Mande Tone: (2.1) pitch features, (2.2) downdrift and downstep, and (2.3) contour tones.

2.1 Pitch features.

Numerous sets of phonological features for the description of tone have been proposed. Some include contour features for the representation of contour tones (Wang 1967). Others say that contour features do not exist and that contour tones must be represented as sequences of level tones (Woo 1969). Some claim that pitch features should be brought together with other laryngeal articulations, such as voicing (Maran 1968 and Bird 1971). And others argue that the features of tone must be kept separate from these other laryngeal features (Fromkin 1971).

The features [high] and [low] have been selected to represent the three tonal levels found in Southwestern Mande.

high	mid	low
$\begin{bmatrix} +\text{high} \\ -\text{low} \end{bmatrix}$	$\begin{bmatrix} -\text{high} \\ -\text{low} \end{bmatrix}$	$\begin{bmatrix} -\text{high} \\ +\text{low} \end{bmatrix}$

When transcribing segmental data in this thesis, an acute accent over the vowel or other tone-bearing segment, symbolized as \acute{v} , marks a high tone.¹ A grave accent, symbolized as \grave{v} , marks a low tone, and a bar over the vowel, \bar{v} , or no accent marks at all, v , indicates a mid tone. In the Central SWM languages where only two contrastive levels of tone occur, high and non-high, the non-high tone is left unmarked and is considered, technically, to be a mid tone, [-high, -low].

Pitch features, [high] and [low], which are independent of other laryngeal features were selected on the basis of the arguments presented in Fromkin (1972). Fromkin argues, for example, that if pitch features also represent states of voicing, then why do tone copying rules (see 3.4) never affect the voicing of consonants? An additional argument comes from Loma, where the inversion of the values of the tonal feature [high] has no effect on the voicing of any of the Loma consonants.

2.2. Downdrift

The SWM languages have a process known as downdrift similar to that reported by Schachter and Fromkin (1968) for Akan². In these languages, any given high tone following a non-high tone is lower in absolute pitch than any high tone preceding that non-high tone. Using a graphic representation where the height of the line corresponds to the height of a pitch, a phonemic sequence óvovóv appears phonetically as follows:

$\overline{ov} \overline{ov} \overline{ov}$ as in Mende $la \overline{nsa} \overline{na}$ 'a man's name'

Also in these languages, a non-high tone following a high tone is lower in absolute pitch than a non-high tone preceding that high tone, although Welmers (personal communication) reports that downdrifting languages where the high tones down-drift and the non-high tones remain relatively level are much more common.³

ov/ovcv as in Mende ni/kil1 'peanut'

Another way to represent downdrift involves assigning each tone bearing unit a numerical pitch value, where a higher numerical value indicates a higher pitch value. By assigning the arbitrary value 5 to the initial high pitch, the above data appear as follows:

ov⁵ ov² ov⁴ as in Mende la⁵nsa²na⁴
 ov³ov⁵ov² ni³ki⁵li²

This numerical system of phonetic tone representation, though more difficult to read than the graphic form, permits the derivation of the downdrifting phonetic representation from the non-downdrifting phonemic representation through the use of n-ary phonetic detail rules. Informally, this rule is stated as follows:

- a) The pitch of the initial tone is arbitrary, although the first high tone in the utterance customarily receives the value 5.
- b) A tone with the same phonemic value as the preceding tone is assigned the same phonetic value.

- c) A high tone following a non-high tone has a value two points higher than the non-high tone (if the first tone of the sequence is non-high, its numerical value is 3 in accordance with the convention mentioned in (a)).
- d) A non-high following a high tone has a value three points lower than that high tone.

More formal statements concerning the derivation of the phonetic downdrifted tones from binary phonemic representations have been proposed by Schachter and Fromkin (1968), Johnson (1970) and Fromkin (1972). The above informal statement most closely resembles the 1968 Schachter and Fromkin statement. The Johnson statement differs primarily in the use of increasing integral values to denote decreases of phonetic pitch. This proposal has the advantage of avoiding negative n-ary values, something not permitted by transformational theory⁴.

Fromkin's 1972 formal statement of Downdrift, using Johnson's suggestion of marking decreases in pitch by increasing integers, first gives a pitch assignment rule.

Pitch Assignment (Fromkin 1972)

- a. [+high] ----> p 1
- b. [-high] ----> p 3 (where p is defined as "relative pitch value")

Then, taking advantage of angle brackets, Fromkin combines c) and d) of the above N-ary Downdrift Rule into a single though slightly different generalization.

Downdrift (Fromkin 1972)⁵

RL $[\alpha \text{high}] \rightarrow [\alpha \text{high } p < +1] / [\alpha \text{high } p] < [-\text{high } 1] > ______$

This rule is an abbreviation of four rules:

- a. [+high] --> [+high p+1] / [+high p][-high] ____
- b. [+high] --> [+high p] / [+high p] ____
- c. [-high] --> [-high p+1] / [-high p][+high] ____
- d. [-high] --> [-high p] / [-high p] ____

(from Fromkin
1972)

The main difference between Fromkin's Downdrift rule and the above informal downdrift statement is that downdrifting does not begin in Fromkin's rule until the third change of tonal values in the utterance. Consequently, as Ann Peters (1973) points out, the pitch intervals of an initial sequence of high non-high high differs from an initial sequence of non-high high non-high. For example, when these rules are applied to 'lansana' and 'peanut', the result is that the interval from high to non-high in the first example is from 1 to 3 and in the second example from 1 to 4.

	lánsaná	'a man's name'	nikíli	'peanut'
Pitch Assignment	la ¹ nsa ³ na ¹		ni ³ ki ¹ li ³	
Downdrift	la ¹ nsa ³ na ²		ni ³ ki ¹ li ⁴	

Yet in Mende, for example, both of these intervals are the same and, consequently, Mende requires a slightly modified downdrift rule. This modification involves the elimination of the first [α high] segment from the environment of subrules a and c of Fromkin's Downdrift rule⁶. Now, downdrifting occurs every time a tone follows a tone of opposite

value. My own version of the Downdrift rule, using the feature [lowered], as defined in the next section (2.3), is as follows:

Downdrift

$[\alpha \text{high}] \rightarrow [+ \text{lowered}] \quad / \quad [- \alpha \text{high}] (c) \underline{\quad}$
 (where c is a non-tone bearing segment).

2.3 Downstep

Downdrift is further complicated by a process known as downstep. A downstepped high tone is a high tone which immediately follows a high tone, but which is slightly lower in pitch than the preceding high tone, such as -ná 'the' in the following Loko examples:

nya ³ ha ⁵ -na ⁴	the woman
ko ³ nda ⁵ -na ⁴	the mortar

Diachronically, most cases of downstepped high tones result from the loss of a non-high tone occurring between these two high tones after the operation of Downdrift as in the following derivation of 'the woman' where the non-high tone segment a² is eliminated.

nyahaa'-ná' --> nya³ha⁴a²-na⁴ → nya³ha⁵-na⁴ 'the woman'

Synchronically, underlying non-high tones can be frequently used to derive surface downstepped high tones. Given a sequence of high non-high high, first Downdrift applies, then the non-high tone is deleted. This approach

is permissible if the presence of the non-high tone can be established on independent grounds. But not all cases of downstep can be treated in this way. Fromkin (1972:67) provides the following examples, from Akan, of morpheme internal downsteps where no evidence is available to support an underlying non-high tone.

a ³ be ⁵ ra ⁵ nte ⁴ ε ⁴	young man
a ³ ku ⁵ a ⁴	the name of a girl born on Wednesday.
a ⁵ a ⁵ ne ⁴	yes

For these non-alternating downstepped high tones, Fromkin proposes that they be represented phonemically as mid tones⁷, even though, this requires a more complicated downdrift rule⁸. Furthermore, Fromkin (1972:60) claims that with this proposal, "the historical development of three-toned languages from two toned languages is more easily revealed." Not all three-toned languages arise from two-toned languages through the phonemicization of a downstepped high tone. Southwestern Mande apparently developed its third tone through the borrowing of class 5 morphemes such as bèlè 'trousers' with a true low tone [-high, +low], thereby promoting the non-high tone [-high, -low] to the status of a mid tone (see chapter 12).

The main objection to the use of a phonemic mid tone for the representation of a downstepped high tone, as Larson (1971) points out, comes from three-toned languages, such as Yalla (Armstrong 1968), Yoruba (Courtenay 1971) and Kpelle

(Welmers 1962), where both high tones and mid tones are downdrifted. If mid tones represented downstepped high tones, then how are true mid tones, not to mention downdrifted mid tones, to be represented?

Larson (1971) suggested that, instead, phonemic downsteps should be marked by the diacritic feature [step]. If [step] is a diacritic feature, it differs from other diacritic features in belonging to a single segment. Normally, a diacritic feature is spread to all the segments of a morpheme.

The feature [step] must be assigned to individual segments; otherwise, the phonemic representation of a⁵a⁵ne⁴ would be impossible. Had [step] been distributed to all of the segments of this morpheme, the effect would be the downstepping of all the high tones in the morpheme (**a⁵a⁴ne³).

Quite possibly, [step] may have the property of belonging to segments rather than morphemes because it is not a diacritic feature, but a phonological feature with properties much like the feature [central] of Wang (1967) or [extreme] (Maddieson 1971). This feature, [lowered], is defined so that any tone having the feature value [+lowered] is lower in pitch than the same tone with the feature value [-lowered]. This proposal makes possible the phonetic and phonemic representation of downstepped highs, mids, and non-highs⁹.

		high	low	lowered	orthography
	high	+	-	-	ᵛ
downstepped	high	+	-	+	ᵛ
	mid	-	-	-	v
downstepped	mid	-	-	+	ᵛ
	low	-	+	-	ᵛ
downstepped	low	-	+	+	ᵛ

No examples of downstepped true low tones are available to me now. Phonemic downstepped high, mid and non-high tones are marked [+lowered]. Phonetic downdrifted high, mid, and non-high tones are supplied with the feature value [+lowered] by a rule, such as the Central SWM Downdrift rule given above, or the more restricted Kpelle version given in 8.2.

This use of the feature [lowered] eliminates the need to convert phonemic tones to n-ary values in order to represent downsteps phonetically. And it leaves the n-ary phonetic detail rules free to describe such facts as the difference in pitch intervals between tones occurring at the beginning of an utterance and those at the end of an utterance. Common practice shows that rules with binary features are preferred over ones with n-ary features except for rules dealing with phonetic details.

Although the phonetic sequence high downstepped high appears frequently throughout the SWM languages, only a few instances occur where the downstepped high must be considered to be phonemic (e.g., Mende: gónᵛɛɛ 'cat'). All of these, interestingly, are in either obvious or suspected borrowed nouns. All of the remaining sequences of

high downstepped high in SWM develop from the deletion of a non-high tone following the application of the Downdrift rule.

Except in modern Kpelle, when an underlying SWM falling tone is followed by an underlying high tone (e.g., Loko kondáa-ná 'mortar-the') a surface sequence of high-downstepped high results. First the Downdrift rule applies adding the feature [+lowered] to the [+high] segment following the non-high segments (kondáa-ná --> kondáa-ná). The surface tones (kondá-ná 'the mortar') result from the reduction of the falling tone to a simple high tone by a rule called Contour Reduction (see 3.4).

2.4 Contour Tones

Contour tones change in pitch during the course of their articulation while non-kinetic or level tones remain at a relatively constant pitch throughout. Earlier transformational treatments of tone have proposed a set of contour features, such as [contour], for the representation of kinetic tones (Wang 1967). More recent treatments have claimed that,

. . . the distinctive features of tone are features of pitch height and that contour tones are represented as sequences of these features, each one of which is uniquely associated with some sonorant segment (Woo 1969: 141)

Contour features suffer from a lack of empirical support. For example, rightward tone-copying rules (see 3.4) copy only the tone features [high] and possibly [low].

Nowhere is there any evidence of the copying of a contour feature. When a kinetic tone is in a position to be copied, only its final component, high for rising and non-high or low for falling, is copied.

Furthermore, a rising tone, represented with the features [-high, +contour], does not explicitly state why this rising tone should function like a high tone in tone copying situations. On the other hand, were a rising tone represented as [+high, +contour], this fact would be explicit. But no longer explicit would be the fact that the onset of this tone functions like a [-high] tone. Woo's proposal, in which a rising tone is represented as a sequence of [-high] followed by [+high], makes both of these facts explicit.

Woo's proposal has one apparent weakness. It permits only long phonemic contour tones. According to current phonological theory, any sequence of two segments differing only by tonal features has a longer duration than either of the single segments. How, then, are short contour phonemic tones to be represented? Leben (1971) suggests that a weaker variant of Woo's claim, that there are no contour features, could be maintained if phonemic tones are represented suprasegmentally. In this process of derivation, these suprasegmental tones would be mapped onto tone-bearing segments, though Leben does not provide the rule. Phonetic contours apparently arise when a sequence of two or more tones are mapped onto the same segment.

If one concedes the existence of a mechanism which permits a sequence of two or more tones to appear on the same phonetic segment, then one should reasonably expect to find the same situation at the phonemic level. This follows one of the fundamental principles of generative phonological theory: that the difference between the levels of systematic phonemics and systematic phonetics is one of degree, the phonemic being more abstract than the phonetic, though none the less real. Thus, whatever the phenomenon being dealt with, the phonemic and phonetic representations should differ only in the degree of specification rather than the kind of features or the way in which they are represented.

Fromkin criticizes the suprasegmental proposal because it requires two separate matrices, "one segmental, one suprasegmental." She proposes an equivalent representation using tone-bearing non-segments. This, she claims, "would create fewer problems" (Fromkin 1972:68). According to the non-segmental proposal, long and short level and contour tones are represented phonemically as follows.¹⁰

Short level	Short rising	Long Level	Long rising
v	v ø	v v	v v
$\begin{bmatrix} +\text{seg} \\ +\text{high} \end{bmatrix}$	$\begin{bmatrix} -\text{seg} \\ -\text{high} \end{bmatrix} \begin{bmatrix} -\text{seg} \\ +\text{high} \end{bmatrix}$	$\begin{bmatrix} +\text{seg} \\ +\text{high} \end{bmatrix} \begin{bmatrix} +\text{seg} \\ +\text{high} \end{bmatrix}$	$\begin{bmatrix} +\text{seg} \\ -\text{high} \end{bmatrix} \begin{bmatrix} +\text{seg} \\ +\text{high} \end{bmatrix}$

While the use of unnatural feature configurations is possible at the phonemic level, though not in accord with the principle of naturalness, unnatural feature configurations,

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being unpronounceable, are impossible at the phonetic level.¹¹

This situation necessitates:

. . . a convention which transfers the tones of the nonsegmental units or non-syllabic vowels to the preceding segment. Once this is done, of course, the contour feature will also have to be added. (Fromkin 1972:69)

If these contour features are permitted, phonetically, then they ought to appear phonemically as well. Thus Fromkin's proposal brings us back to the use of contour features, for which there is no empirical evidence¹².

Larson (1971:174) raises another criticism of the Fromkin non-segment proposal, "What sort of process deletes segments with no phonetic properties?" The question of distinctness must also be raised. Is $v\phi$ distinct from ϕv ? Is $v\phi$ distinct from $v\phi\phi$? Although answers to these questions can be provided, they complicate the existing theory and obscure the fundamental problem, the conflict between the feature [length] and the feature [segment]. The resolution of this conflict leads to a solution of the problem of representing short-contour tones both phonemically and phonetically.

Traditionally, long segments have been indicated either by repeating the segment or by marking the segment as long. Each of these techniques is also available to systematic phonemics. If there are two ways of indicating length, then, according to the distinctness principle (Chomsky and Halle 1968: 336), these two ways of representing length are

distinct and ought to have different pronunciations. If these representations are non-distinct, then either the features [segment] and [length] must be redefined or the distinctness principle must be reformulated to incorporate this situation.

The feature [length] specifies the duration of a segment. Phonetically [length] appears with n-ary values which correspond to the passage of time, the larger the integral value, the longer the duration of the segment. Phonemically, the n-ary continuum is split into two categories [+length] 'longer' and [-length] 'shorter'.

To show how length operates on the phonetic level, compare the following segment and segment sequence. Each has the arbitrary length 2.

$$(1) \begin{bmatrix} +\text{segment} \\ \text{length } +1 \end{bmatrix} \begin{bmatrix} +\text{segment} \\ \text{length } +1 \end{bmatrix} \quad (2) \begin{bmatrix} +\text{segment} \\ \text{length } +2 \end{bmatrix}$$

Both (1) and (2) above have the same duration, and if their other segmental features are identical, these two representations are non-distinct. Suppose that the first segment in (1) has a high tone and the second segment has non-high tone:

$$(1a) \begin{bmatrix} +\text{segment} \\ \text{length } +1 \\ +\text{high} \end{bmatrix} \begin{bmatrix} +\text{segment} \\ \text{length } +1 \\ -\text{high} \end{bmatrix}$$

This segment sequence, while having the same duration as (2), has a different tonal configuration. It is a falling tone. If (2) represents a short level tone, then (1a) represents

a short falling tone. Long level and contour tones are represented as follows:

(3) Long level

$$(a) \begin{bmatrix} +\text{segment} \\ \text{length} +4 \\ +\text{high} \end{bmatrix} \quad \text{or} \quad (b) \begin{bmatrix} +\text{segment} \\ \text{length} +2 \\ +\text{high} \end{bmatrix} \begin{bmatrix} +\text{segment} \\ \text{length} +2 \\ +\text{high} \end{bmatrix}$$

(4) Falling

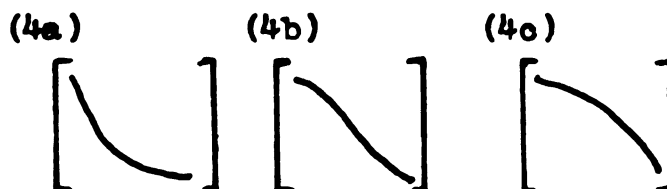
(a)

or (b)

$$\begin{bmatrix} +\text{segment} \\ \text{length} +1 \\ +\text{high} \end{bmatrix} \begin{bmatrix} +\text{segment} \\ \text{length} +3 \\ -\text{high} \end{bmatrix} \begin{bmatrix} +\text{segment} \\ \text{length} +2 \\ +\text{high} \end{bmatrix} \begin{bmatrix} +\text{segment} \\ \text{length} +2 \\ -\text{high} \end{bmatrix}$$

$$\text{or (c)} \begin{bmatrix} +\text{segment} \\ \text{length} +3 \\ +\text{high} \end{bmatrix} \begin{bmatrix} +\text{segment} \\ \text{length} +1 \\ -\text{high} \end{bmatrix}$$

While the representations in (3) are equivalent, those in (4) are distinct and can be represented graphically as follows:



If the representations (3a) and (3b) are equivalent, then the distinctness principle must be redefined so that (3a) and (3b) are non-distinct. Such a redefinition might be stated as follows: Any sequence of identical segments is non-distinct from any other sequence of the same segments as long as the duration of each sequence is the same. This definition can be stated more clearly as follows:

$$\begin{bmatrix} \alpha\text{feature} \\ \text{length } w \end{bmatrix} \begin{bmatrix} \alpha\text{feature} \\ \text{length } x \end{bmatrix} = \begin{bmatrix} \alpha\text{feature} \\ \text{length } y \end{bmatrix} \begin{bmatrix} \alpha\text{feature} \\ \text{length } z \end{bmatrix}$$

(if $w + x = y + z$)

With this modification of the distinctness principle, then, long segments may be represented phonemically with a feature of length or with geminate segments.

But then, how is the phonemic distinction between short and long, level and contour to be represented? Suppose, in the above examples (omitting 4a and 4c) that [length+1] corresponds phonemically to 'short' or [-length] and that phonetic [length+2] corresponds phonemically to 'long' or [+length]. Thus (1a), (2), (3) and (4b) have the following phonemic representations:¹³

(1a) short falling

$$\begin{bmatrix} +\text{segment} \\ -\text{length} \\ +\text{high} \end{bmatrix} \begin{bmatrix} +\text{segment} \\ -\text{length} \\ -\text{high} \end{bmatrix}$$

(2) short level

$$\begin{bmatrix} +\text{segment} \\ +\text{length} \\ +\text{high} \end{bmatrix}$$

(3) long level

$$\begin{bmatrix} +\text{segment} \\ +\text{length} \\ -\text{high} \end{bmatrix} \begin{bmatrix} +\text{segment} \\ +\text{length} \\ -\text{high} \end{bmatrix}$$

(4b) long falling

$$\begin{bmatrix} +\text{segment} \\ +\text{length} \\ +\text{high} \end{bmatrix} \begin{bmatrix} +\text{segment} \\ +\text{length} \\ -\text{high} \end{bmatrix}$$

This use of the binary values of [length], while unorthodox, follows the generative phonological principle of using the values plus and minus to indicate a division of the phonetic scale into two categories.¹⁴ The use of length in this way enables the phonetic and phonemic representation of both level and contour to be represented naturally and in the same way as other phonological events. This use of

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length involves no new distinctive features. Furthermore, it permits the phonetic representations of a number of differing tone contours (4a, 4b and 4c) which have the same length and are composed of the same tone sequences.

This use of the feature [length] also permits the retention of Woo's strong claim about contour tones phonemically being sequences of tonal features, each being uniquely associated with a single sonorant segment. Finally, it is possible to retain Halle's claim that there are no contour features.

. . . on the systematic level, all tones are stationary. Non-stationary tones, such as 'rising', 'falling' or 'convex', are more or less surface phenomena; they have much the same status as different formant transitions that are found in a given vowel when it is adjacent to different stop consonants (Halle 1971 in Fromkin 72:62).

Thus, with a universal statement stating when to interpret a sequence of two different tone-bearing segments as a sequence of two level tones, and when as a single contour tone, "the absolute nature of the phonetic signal is fixed and one can," according to Halle (in Fromkin 1972:63), "dispense with any contour tonal feature."

Such a universal statement might be stated as follows:
A surface contour tone can arise if and only if two or more tone-bearing segments, differing only in tonal composition, occur adjacently.

Mende morphemes with deletable consonants provide a good illustration of this statement. When two tone-bearing units of different tonal composition are separated by a deletable consonant, no phonetic contour occurs. When the consonant is deleted, a phonetic contour arises. An example of this is the optional deletion of l in nikíl.í, the Mende word for peanut.

Mende	nikíl.í ¹⁵	<u>no deletion</u> →	<u>nikíl.í</u>	'peanut'
	nikíl.í	<u>deletion</u> →	<u>nikí.í</u>	'peanut'

When two tone-bearing segments are separated by non-tone-bearing segments, tone glides never result. Given the sequence vcv, its phonetic realization is a level low tone followed by a level high tone, v̄cv̄. It may not be a gradual rise from low to high. ~~**vcv̄~~.

In Nupe (George 1970), however, the phonetic realization of v̄cv̄ is phonetically low-high when the medial consonant is a voiceless obstruent, and low-rising when the medial consonant is a voiced obstruent.

	Phonemic	Phonetic	
Nupe	ètú	èté	'parasite'
	èdú	èdùú	'taxes'

The fact that the onset of the rising tone of the phonetic representation of 'taxes' begins following the voiced obstruent is consistent with the statement that contour tones can only arise from adjacent segments differing

only in tonal values. This rising tone in Nupe results from a glide rule which converts a morpheme-final high tone to a rising tone when preceded by the sequence of low followed by a voiced obstruent.

Nupe Glide

$$\begin{bmatrix} +\text{length} \\ +\text{high} \end{bmatrix} \rightarrow \begin{bmatrix} -\text{length} \\ +\text{low} \end{bmatrix} \begin{bmatrix} -\text{length} \\ +\text{high} \end{bmatrix} / \begin{bmatrix} +\text{low} \end{bmatrix} \begin{bmatrix} -\text{sonorant} \\ +\text{voice} \end{bmatrix} _$$

(e.g., èdú ----> èdùú)

In Nupe, when two tone-bearing units differing only in tone are separated only by a morpheme boundary such as Nupe ebe+ètí 'monkey-howling', two phonetic realizations may occur, one in slow, careful speech, and one in rapid speech.

Slow èbè+ètí rapid èbètí

In rapid speech, the morpheme boundary has been overlooked, while in slow speech it is observed. Similar kinds of behavior have been reported by Harris (1969) who demonstrated that in the several rates of speech, Spanish phonological rules observed grammatical boundaries differently¹⁶.

Thus, from the evidence currently available, Halle's claim that there are no contour features can be maintained.

2.5 Summary

In this chapter, the following proposals for the treatment of Southwestern Mande tone were made: 1) the use of the tonal features [high] and [low] for the representation of the three levels of SWM, 2) the use of the feature [lowered] to permit the binary marking of downdrifted and downstepped tones, which can also be used to distinguish more than three contrastive pitch levels, and 3) a modified use of the feature [length] to permit the representation of short contour tones as a sequence of two tone-bearing segments.

None of these proposals involved the introduction of new distinctive features, only the modification and expanded use of existing features.

Footnotes

Chapter 2

1. In this thesis, there is a need to distinguish between all tone-bearing segments and all non-tone-bearing segments. This arises because of the nature of the SWM tone copying rules (3.4), which advance a tone across non-tone-bearing segments onto the next tone-bearing segments. Because these non-tone-bearing segments include the segments l, y, w and the non-syllabic nasals, neither the feature [sonorant] nor the feature [vocalic] can provide this distinction. In this thesis, a lower case y represents a tone bearing segment, and a lower-case q represents a non-tone-bearing segment.
2. The Downdrift of Kpelle, called "downtilt" by Welmers, is restricted to words in a sentence-final position (see 8.1).
3. Welmers (1959:4) has a description of a tonal system where the high tones downdrift and the low tones remain at the same relative pitch.
4. When the above rules are applied to the Mende utterance:

nya'mia, ngí ló-ngó, ngí nika+wóve-í gbé.

I it is, I want-ed, I cow+old-the beat

the phonetic output is:

nya⁵mi²a², ngi⁴lo⁴-ngó¹, ngi³ni⁰ka⁰wo⁰ve⁻¹-i¹gbé¹

and the second syllable of wove 'old' has a negative phonetic tone value.

5. Fromkin, following Johnson (1970), uses the RL prefix to indicate that the rule has a right linear ordering, that is, the rule applies sequentially from left to right.
6. Actually, because the determination of downstep in Fromkin's rule requires that the pitch value of the preceding tone-bearing segment be of the same binary value, the correction of this weakness would involve considerable revision. Peters (1973) has proposed one such revision. However, neither the Peters rule nor Fromkin's rule succeed with languages which have three levels of tone and downdrift (see 2.3)

7. Fromkin uses the feature configuration [+high, +mid] to represent a mid tone, and the following Downdrift rule.

$$[\alpha \text{high}] \rightarrow [\alpha \text{high } p(+1)]_{1,2} / \left[\begin{smallmatrix} \alpha \text{high} & p \\ \leftarrow \text{mid} & \rightarrow \end{smallmatrix} \right]_1 < [-\alpha \text{high}]_1 >_2 \left[\begin{smallmatrix} +\text{mid} \\ \text{---} \end{smallmatrix} \right]$$

8. Larson (1971:176) notes that Stahlke has observed a downstepped non-high. Downstepped non-high tones also occur in Mende, as in the following example, in which the high-toned anaphoric pronoun ngí, 'I', is deleted between two non-high tones.

nyáá, ngí wá-má ----> nyáá wá-má nyáa-wá-fma
I-it is, I come-ing I'm coming

Because downstepped non-high tones are so rare in SWM, the convention of marking only lowered high tones will be followed in the remainder of this thesis.

9. This feature can also be used to distinguish languages which have more than three tonal levels, but which do not have downstep. Of course, if there are languages with more than three contrastive levels of tone and downdrift, the approach to downdrift proposed in this chapter will have to be abandoned.
10. A similar proposal is found in Maddieson (1971) using non-syllabic vowels in place of non-segments.
11. If the naturalness principle is relaxed, as it is in Stratificational Grammar, this objection disappears.
12. Fromkin's contour feature differs slightly from the one discussed earlier in this section (2.4), for instead of marking the tonal level of the onset of the tonal contour, she suggests that the terminal level of the contour be marked. This proposal also suffers from the lack of explicitness pointed out above (2.4).
13. So far, the need for a sequence [+length, -length] has not arisen in the study of SWM tone, an observation which should simplify the marking of these tones in the lexicon. Yet this sequence may be useful in representing tones such as (4a) in contrast to (4b) and (4c). It may also be of use to languages with three degrees of length, such as Icelandic or Estonian (see Lehiste 1970).
14. Orthographically, short contour tones are written as two adjacent vowels v̄v or v̄v̄. Long vowels, whether contour or level, are written as two segments separated by a period: v̄.v̄, v̄.v̄, v̄.v̄ and v̄.v̄.

15. The use of a period in this context indicates, following Spears (1968 a & b), that the preceding consonant is deletable.
16. If a phonemic contrast ever developed between ɛ̣e and ɛe it would be expected to arise under the same conditions and be the same sort of difference as between king's town and Kingston.

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Chapter 3

Some General Characteristics of Southwestern Mande Nominals

3.0 The following chapters (4-8) contain descriptions of the tonal patterns of the nominal constructions of each SWM language. This chapter establishes the background for the presentation of these analyses. It includes a summary of the phonological characteristics of SWM and a description of the types of nominal constructions used in this study.

3.1 Vowels

The vowel systems of SWM are representative of a typical West African seven-vowel system:

	front unrounded	back unrounded	back rounded
high	i		u
mid	e		o
low	ε	a	ɔ

Figure 3-1: SWM vowels.

3.2 Consonants

SWM consonants are classified into three series: light, heavy, and nasal. This classification is based on the system of initial consonant alternation, a phenomenon common to all of the SWM languages. The light series

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includes both voiced and voiceless non-nasal obstruents. The heavy series includes prenasalized stops, liquids, and the labial implosive $\underset{\cdot}{b}$.¹ Both nasal obstruents and nasalized liquids belong to the nasal series. These SWM consonants are listed in Figure 3-2 below, though not all of these consonants occur in any one SWM language. Following standard SWM orthography, the diagraph ny represents a palatal nasal.

Prenasalized stops, for example, do not occur in Loma, having been replaced by voiced geminate stops (see the discussion of the development of consonant mutation in this section). The implosive $\underset{\cdot}{b}$ does not appear in Mende, $\underset{\cdot}{c}$ appears only in Loko, and $\underset{\cdot}{r}$ only in Kpelle (and possibly Loko).

light series	Voiceless	p	f	t	s	ɕ	k	kp
	Voiced	b	v	d	z	ʝ	g	gb
heavy	prenasalized stops	mb	nd	nj	ng	ngb		
	liquids, glides and $\underset{\cdot}{b}$ ²	w/b	l/r	y	ɣ	ɸ	h	
nasal series	nasal stops	m	n	ny	ɳ			
	nasal liquids and glides	ɸ		ɣ	ɸ	ɸ	h	

Figure 3-2: Southwestern Mande consonants.

One of the most striking features of the SWM languages is the phenomenon known as consonant mutation, a process whereby most morpheme-initial consonants change their manner of articulation in certain environments. While a complete discussion of this phenomenon is beyond the scope of this

presentation, the following summary, based on Dwyer (1973), is provided because consonant mutation occurs in most of the nominal constructions used in the analysis of SWM tone.

Each of the three series of alternating consonants, light, heavy, and nasal, has a strong and a weak member. The strong member generally has a more fortis articulation than the weaker, though not always. Thus in the alternations nd-l and f-v, nd and f are termed strong and l and v are termed weak.

Mende	ndáwé-í	the leaf	nyá+lawé-í	my leaf
	fé.é-í ³	the wind	nyá+vɛ.é-í	my wind

A complete listing of strong and weak consonant alternations for each of the SWM languages is given in Figure 3.3.

Not all Southwestern Mande consonants alternate. For example, Mende nasal consonants do not alternate, nor do the initial consonants of recently acquired morphemes (particularly those which begin with a weak consonant). Recently acquired morphemes in Bandi which begin with a strong initial consonant optionally alternate.

Bandi	kɔhí-ngí	the coffee	
	ní-wóhí-ngí	my coffee	or ní-kóhí-ngí

The historical development of the strong-weak initial consonant alternation is intimately associated with the four different underlying nasals of Proto-Southwestern Mande: *n̄- 'my', *n̄₁- 'his', *n̄₂- 'prerference', and

The Light Series

Loko		Mende ⁴		Bandi		Loma		Kpelle		
<u>St</u>	<u>Wk</u>	<u>St</u>	<u>Wk</u>	<u>St</u>	<u>Wk</u>	<u>St</u>	<u>Wk</u>	<u>St</u> ₁	<u>St</u> ₂	<u>Wk</u>
p	b	p	b/w ^b	p	v	p	b/w ^b	bb	mb	p
f	h	f	v	f	h	f	v	vv	mv	f
t	l	t	l	t	l	t	l	dd	pd	t
h	h	h	h	s	h	s	z	zz	pz	s
k	ɣ/w ^a	k	g	k	ɣ/w ^a	k	ŋ/ɣ/w ^d	gg	pg	k
kp	gb	kp	gb	kp	ɸ	kp	ɸ	ggb	ngb	kp

The Heavy Series

Loko		Mende		Bandi		Loma		Kpelle		
<u>St</u>	<u>Wk</u>	<u>St</u>	<u>Wk</u>	<u>St</u>	<u>Wk</u>	<u>St</u>	<u>Wk</u>	<u>St</u> ₁	<u>St</u> ₂	<u>Wk</u>
mb	b	mb	b	mb	y/w ^c	bb	b/w ^b	m̥	m̥	ɸ
nd	l	nd	l	nd	l	dd	l	n̥	n̥	l
nj	y	nj	y	nj	y	zz	y	py	py	y
ng	ɸ	ng	y	ng	y	gg	ŋ/ɣ/y ^d	n̥	n̥	ɸ
		ng	w	ng	w			ŋw	ŋw	w

The Nasal Series^e

Loko		Mende		Bandi		Loma		Kpelle		
<u>St</u>	<u>Wk</u>	<u>St</u>	<u>Wk</u>	<u>St</u>	<u>Wk</u>	<u>St</u>	<u>Wk</u>	<u>St</u> ₁	<u>St</u> ₂	<u>Wk</u>
m	ɸ/w ^b	m	m	m	ɣ/w ^c	m	m	m̥	m̥	m
n	n	n	n	n	n̥	n	n	n̥	n̥	n
ny	ny	ny	ny	ny	ȳ	ny	ny	ny	py	ny
ŋ	ŋ	ŋ	ŋ	ŋ	ŋ	ŋ	ŋ	ŋ	ŋ	ŋ

(a) w/___V_{rd}, ɸ/___V_{-rd}(b) w/___V_{bk}, y/___V_{-bk}(c) w/___V_{bk}, y/___V_{-bk}(d) ŋ/___Ṽ, w/___V_{rd}, ɸ/___V_{-rd}

(e) Vowels following underlying nasals are nasalized

Figure 3-3: Southwestern Mande consonant alternations.

noun-final nasals, ...n.⁵ Strong consonants result when these nasals interact with a following weak consonant. Weak consonants occur in the absence of a preceding nasal. Consequently, the grammatical distribution of strong consonants coincides with the distribution of the four types of nasals listed above. Examples of the occurrence of strong and weak initial consonants are given in the following chapters, and the history of the development of these nasals is given in chapter 14, where the synchronic status of these nasals is discussed. What follows is a summary of the development of the phonological rules that created the initial consonant alternations of the various SWM languages.

To begin with, Proto-SWM has three series of underlying consonants:

a light series	*p	*f	*t	*s	*k	*kp
a heavy series	*w		*l	*y	*ɣ	*ɓ
a nasal series	*m		*n	*ny ⁶	*ŋ	

When preceded by a nasal consonant, the surface form of these consonants in Proto-SWM is modified by two phonological rules. The first of these, Nasal Absorption, merges a heavy consonant with a preceding nasal prefix, producing a single segment, a nasal obstruent, with the point of articulation of the heavy consonant and the tone of the nasal. This rule also merges sequences of two nasal consonants.

Nasal Absorption (P-SWM)

[nasal] +	ɸ	-->	m	[nasal] +	m	-->	m
	l		n		n		n
	y		ny		ny		ny
	x		ŋ		ŋ		ŋ
	w		ŋ ^w		ŋ ^w		ŋ ^w

When not preceded by a nasal consonant, these heavy consonants remain unaffected, thus producing the following alternations:

nasal +	cons	~	cons	nasal +	nasal ~	nasal
	m		ɸ		m	m
	n		l		n	n
	ny		y		ny	ny
	ŋ		ɸ		ŋ	ŋ
	ŋ ^w		w		ŋ ^w	ŋ ^w

Next, the more restricted Geminatation rule assimilates the low toned nasals \dot{n}_1 - and \dot{n}_2 - to the point and manner of the following consonants. This rule affects only sequences of nasal plus light consonant, since the Nasal Absorption rule has already absorbed post-nasal heavy consonants and nasals⁷.

Geminatation⁸ (P-SWM)

$\dot{n}+c$	-->	cc
$\dot{n}+p$		pp
$\dot{n}+f$		ff
$\dot{n}+t$		tt
$\dot{n}+s$		ss
$\dot{n}+k$		kk
$\dot{n}+kp$		kkp

Alternation (P-SWM)

$\dot{n}+c$	~	c
pp		p
ff		f
tt		t
ss		s
kk		k
kkp		kp

Low toned nasals geminate, while others do not, presumably because low toned nasals are unstressed. Stress in SWM generally falls on high toned syllables. Non high toned syllables, for the most part being unstressed, are, therefore, more likely to lose their distinctiveness (i.e., assimilate).

These two rules, Nasal Absorption and Geminization, cause the initial consonant alternation of the reconstructed Proto-SWM language. This alternation differs from that of modern Kpelle by only one rule, Post-Nasal Voicing, which, as the term implies, voices Kpelle post-nasal obstruents. Because this rule is ordered before the Geminization rule, voiced, rather than voiceless, geminate consonants are derived in Kpelle.

Post-Nasal Voicing (Kpelle)		Alternation (Kpelle)	
n̩+p	----> n̩+b	Gem--> bb ⁹	bb~p
n̩+f	n̩+v	vv	vv f
n̩+t	n̩+d	dd	dd t
n̩+s	n̩+z	zz	zz s
n̩+k	n̩+g	gg	gg k
n̩+kp	n̩+gb	ggb	ggb kp

High toned nasals in Kpelle also cause a following obstruent to voice, but, as in Proto SWM above, these high toned nasals do not undergo gemination.

Post Nasal Voicing (Kpelle)		Alternation
ṇ+p	---> ṇ+b	ṇb ~ p
ṇ+f	ṇ+v	ṇv f
ṇ+t	ṇ+d	ṇd t
ṇ+s	ṇ+z	ṇz s
ṇ+k	ṇ+g	ṇg k
ṇ+kp	ṇ+gb	ṇgb kp

Post-Nasal Voicing applies only to consonants following the Kpelle nasal prefixes ṇ-, ṇ₁, and ṇ₂, and not to those following the morpheme-final nasal ...ṇ, no doubt because of a junctural difference.

Three rule developments characterize the emergence of the Proto-Central SWM system of consonant mutation: a broadening of the Geminization rule, the voicing of weak consonants, and the expansion of certain nasals into prenasalized obstruents.

The gemination rule broadened to include the high-toned nasal prefix ṇ- and morpheme-final nasal, ...ṇ.¹⁰ Consequently the range of application of the Central SWM Geminization rule became the same as that of the Nasal Absorption rule, which in Central SWM also includes morpheme-final nasals, giving the system of initial consonant alternation a more symmetrical appearance.

In contrast to the Kpelle Post-Nasal Voicing rule, Proto-Central SWM developed a Weak Consonant Voicing rule. Here, weak (non-geminate) obstruents become voiced. Many of the newly voiced weak consonants then weakened to become ¹¹quids and glides (d → ɰ, g → ɣ, and gb → ɣb).



Weak Consonant Voicing (CSWM)

p	-->	b
f		v
t		d
s		z
k		g
kp		gb

Alternation (CSWM)

pp	~	b
ff		v
tt		d (1)
ss		z
kk		g (ɣ)
kkp		gb (ɓ)

With Post-Nasal Voicing in Kpelle and Weak Consonant Voicing in Central SWM, the light series of Kpelle appears to alternate in the opposite direction from that of Proto-Central SWM (see Figure 3-3). The alternation between strong (geminate) and weak consonants, however, is in the same direction in all SWM languages.

Nasal Expansion, the final development of Proto-Central SWM, converts those nasal consonants not followed by a nasalized vowel into prenasalized obstruents.

Nasal Expansion (Central SWM)

m	-->	mb
n		nd
ny		nj
ŋ		ng
ŋ ^w		ng ^w

Alternation (Central SWM)

mb	~	ɓ
nd		l
ny		y
ng		ɣ
ng ^w		w

Nasal Expansion (Central SWM)

[+nasal] --> [+nasal] [-nasal] / [-nasal] [+vocalic]

This rule denasalizes part of nasal segments not followed by nasalized vowels. Prior to the application of the Nasal Absorption rule, there is a nasalization rule that

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nasalizes the vowels following nasal obstruents. Thus at the time of the Nasal Expansion rule, underlying nasal consonants are followed by a nasalized vowel and do not undergo Nasal Expansion. Since those nasals created by the Nasal Absorption rule are followed by an oral vowel at this point, they do undergo the Nasal Expansion rule.

Gloss	the cow	the hole	(Proto-Central SWM)
Base	*n-nikaa-í	*n-ló.á-í	
Nasalization	n-níkaa-í		
Nasal Absorption	nikaa-í	nó.á-í	
Nasal Expansion		ndó.á-í	

The last major consonant development, the reordering of the Nasal Expansion rule, occurred in Loma. As a result of this reordering, sequences of both underlying nasal plus consonant and derived prenasalized consonants feed into the Gemination rule. Thus, in Loma, prenasalized consonants become voiced geminate consonants.

Nasal Expansion		Gemination (Loma)		Alternation (Loma)	
m	--> mb	--->	bb	bb ~	b
n	nd		dd	dd	l
ny	nj		jj	jj	y
ŋ	ng		gg	gg	ɣ
ŋ ^w	ng ^w		gg ^w	gg ^w	w

In addition to the above major SWM consonant developments, several minor developments have also occurred, as can be seen by examining Figure 3.3.

3.3 Tone

In this thesis, the three tonal levels of SWM, high, mid, and low, have been assigned the following feature configurations:

high	mid	low
$\begin{bmatrix} +\text{high} \\ -\text{low} \end{bmatrix}$	$\begin{bmatrix} -\text{high} \\ -\text{low} \end{bmatrix}$	$\begin{bmatrix} -\text{high} \\ +\text{low} \end{bmatrix}$

A three-way tonal contrast occurs only in Modern Kpelle and Proto-SWM. The Central SWM languages all have a two-way contrast between high and non-high; non-high tones having the same feature content as mid tones, $[-\text{high}, -\text{low}]$. High tones are transcribed with an acute accent mark over the vowel or other tone bearing unit, low tones with a grave accent, and mid and non-high tones with no accent mark at all.

These various tones combine to produce five native SWM tonal pattern classes, numbered from 1 to 5. The tonal prototypes of these classes, given below, represent the underlying tonal configurations assumed to exist in Proto-SWM.

<u>Class</u>	<u>Proto-SWM Base</u>
1	$(c\acute{v})c\acute{v}(\acute{\eta})$
2	$(cv)cv(\eta)$
3	$(cv)c\acute{v}\grave{v}(\acute{\eta})$
4	$c\acute{v}c\grave{v}(\acute{\eta})$
5	$c\grave{v}c\grave{v}(\eta)$

To facilitate the comparison of these tonal types from language to language, the tonal classes in each language have been consistently numbered. Thus tone class 1, for example, in each of the SWM languages corresponds to the same tone proto-type. Because of a number of tonal restructurings of these tonal classes, the underlying tones of these tonal classes are not always identical throughout the SWM languages. For example tone class 3 (cv) c'v restructured in Proto-Bandi-Loma to (cv)c'v (see 11.3).

In addition to the 5 native Proto-SWM tonal classes, there are some non-native tonal classes which were acquired by the individual SWM languages since the time of the break-up of Proto-SWM. Morphemes which have a base tone pattern of cv'v have been arbitrarily assigned to class 6 and those with a c'v'v tonal pattern to class 7.

Most Southwestern Mande nouns and verbs are bisyllabic. Not all bisyllabic morphemes, however, have medial consonants. There are a few monosyllabic and a very few polysyllabic nouns, the latter type either being compounds or not native to SWM. Since bisyllabic nouns are the most representative SWM noun type, most of the examples in the following chapters involve bisyllabic nouns.

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1/8192
1/16384
1/32768
1/65536
1/131072
1/262144
1/524288
1/1048576
1/2097152
1/4194304
1/8388608
1/16777216
1/33554432
1/67108864
1/134217728
1/268435456
1/536870912
1/1073741824
1/2147483648
1/4294967296
1/8589934592
1/17179869184
1/34359738368
1/68719476736
1/137438953472
1/274877906944
1/549755813888
1/1099511627776
1/2199023255552
1/4398046511104
1/8796093022208
1/17592186044416
1/35184372088832
1/70368744177664
1/140737488355328
1/281474976710656
1/562949953421312
1/1125899906842624
1/2251799813685248
1/4503599627370496
1/9007199254740992
1/18014398509481984
1/36028797018963968
1/72057594037927936
1/144115188075855872
1/288230376151711744
1/576460752303423488
1/1152921504606846976
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1/4835703278458516698824704
1/9671406556917033397649408
1/19342813113834066795298816
1/38685626227668133590597632
1/77371252455336267181195264
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3.4 Rules

The description of the tonal behavior of SWM nominals requires five general types of tone rules: Downdrift, Contour Tone Reduction, Tone Copying, Lowering, and Tone Inverting. The Downdrift rule has been discussed in 2.2.

3.41 Contour Tone Reduction rules convert contour tones (falling and rising) into level tones. Three different types of these rules, Contour Reduction, Low Loss, and High Loss, occur in the various SWM languages. Contour Reduction, the most common of these, follows Downdrift in Mende, Loko, Bandi, and Kpelle, and reduces contour tones to high tones by changing the value of the feature [high] from [-high] to [+high]. In the following formal statement of the Mende Contour Reduction rule, sentence-final falling tones are not reduced.

Contour Reduction (formal statement)

$$[-\text{high}] \quad \rightarrow \quad [+ \text{high}] \left\{ \begin{array}{l} \left[\begin{array}{c} \text{---} \\ -\text{length} \end{array} \right] \left[\begin{array}{c} +\text{high} \\ -\text{length} \end{array} \right] \\ \left[\begin{array}{c} +\text{high} \\ -\text{length} \end{array} \right] \left[\begin{array}{c} \text{---} \\ -\text{length} \end{array} \right] \end{array} \right. \quad \left. \begin{array}{l} \text{except sen-} \\ \text{tence final-} \\ \text{ly} \end{array} \right\}$$

The Contour Reduction rule converts a contour tone by changing the [-high] -toned component to [+high], thereby creating a sequence of two short high-toned segments. This sequence is equivalent to one [+long] high-toned segment (see 2.4).

$$\left[\begin{array}{c} +\text{high} \\ -\text{length} \end{array} \right] \left[\begin{array}{c} +\text{high} \\ -\text{length} \end{array} \right] = \left[\begin{array}{c} +\text{high} \\ +\text{length} \end{array} \right]$$

1

In subsequent chapters, to save space, this rule is abbreviated as follows, (using lower case q's to indicate non-tone-bearing segments and lower case y's to indicate tone-bearing segments).

Contour Reduction (informal statement)

$$v \quad \rightarrow \quad \acute{v} / \{ \acute{v} \dots \}$$

Most of the sequences of high-downstepped high in SWM result from the reduction of a complex tone preceding a high tone. Because the falling tone is reduced following the assignment of Downdrift, the sequence high-downstepped high results (see 2.2). The more restricted Kpelle and Proto-SWM versions of the Contour Reduction rule eliminate only morpheme-internal [-high] components of contour tones (see 8.1 and 10.8).

The other two contour reduction rules, Low Loss¹¹ and High Loss, change a contour tone to a level tone when the final component of the contour tone is followed by a tone of identical value.

Low Loss (Central SWM)

$$v \quad \rightarrow \quad \acute{v} / \acute{v} _ (o) v \quad (\text{where unmarked } \underline{v}'\text{'s are } [-\text{high}, -\text{low}]).$$

$$\acute{v} v o v \rightarrow \acute{v} \acute{v} o v \rightarrow \acute{v} o v \quad (\text{where } \acute{v} \acute{v} = \acute{v} \text{ (see 2.4)})$$

High Loss (Loko)

$$\acute{v} \quad \rightarrow \quad v / v _ (o) \acute{v}$$

$$v \acute{v} o \acute{v} \rightarrow v v o \acute{v} \rightarrow v o \acute{v} \quad (\text{where } v v = v \text{ (see 2.4)})$$

Each of these tone reduction rules is associated with one of the high-tone copying rules: High Loss with First High Tone Copying, and Low Loss with Second High Tone Copying.

3.42 Tone copying rules in general apply from left to right and have the effect of extending the domain of a particular tone, one tone-bearing segment to the right. These rules can advance either a high, a mid, or a low tone. Some tone copying rules are restricted to applying across junctural boundaries; others apply only within junctural boundaries.

Southwestern Mande tone copying rules advance a tone by converting the next tone-bearing segment from a level tone into a contour tone as illustrated in chapters 4, 5 and 8 (dealing with Mende, Loko, and Kpelle tone respectively). Both high and non-high tone copying rules appear in SWM: First High Tone Copying (the first of the two high-tone copying rules), Second High Tone Copying, and Low Tone Advancement.¹² High-tone copying rules are found in all of the SWM languages. These rules differ from language to language as to the environments in which they apply; however, all high tone copying rules conform to the following schema, stated below both formally and informally:

High Tone Copying (Formal)

$$\begin{bmatrix} -\text{high} \\ +\text{length} \end{bmatrix} \rightarrow \begin{bmatrix} +\text{high} \\ -\text{length} \end{bmatrix} \begin{bmatrix} -\text{high} \\ -\text{length} \end{bmatrix} / \begin{bmatrix} +\text{high} \end{bmatrix} (o)^{13} \underline{\quad}$$

High Tone Copying (Informal)

$$v \rightarrow \acute{v}v / \acute{v}(o)\underline{\quad}$$

3.43 The Southwestern Mande Lowering rule may be, historically, a special case of a tone copying rule. This rule lowers the tone of the second constituent of Kpelle nominal compounds and the second constituents of Central SWM possessives and nominal compounds. In Kpelle, these tones are lowered to [-high, +low], in the Central SWM languages to [-high, -low]. This lowering rule is always followed by one or more tone copying rules in SWM.

3.44 Tonal Inversion, the most unique and spectacular rule in SWM, is a diachronic rule. This rule reversed the values of all the occurrences of the feature [high] of Loma rules and base forms. All Central SWM high tones became in Loma [-high], all Central SWM [-high] tones became [+high] and all rising tones became falling. The tonal inversion of Loma is demonstrated in chapter 13.

3.5 Surface Nominal Syntax

This section contains a summary of the major surface syntactic characteristics of the SWM nominal constructions used in the tonal analysis of the subsequent chapters. The sources listed below, selected on the basis of availability, accuracy, and, where possible, brevity, provide more detailed accounts of the syntactic properties of each of the SWM languages:

Mende:	Innes 1967
Loko:	Innes 1964
Bandi:	Heydorn 1940
Loma:	Sadler 1951
Kpelle:	Welmers 1954

3.51 The definite suffix in Mende has only one allomorph, -í, though in Loko, Bandi and Loma it has two. After nouns which historically end in a nasal consonant (also called here strong-conditioning nouns), the definite appears as -ngí in Loko and Bandi, and -gi in Loma. Following these nouns in Kpelle, the definite suffix is deleted. After nouns which historically end in an oral vowel (weak conditioning nouns), the definite suffix appears as -í in all of the SWM languages but Loma where it is -i.

	following weak conditioning nouns		following strong conditioning nouns	
Mende	pé.é-í	the house	kómi-í	the bee
Loko ¹⁴	péré-í	" "	kóŋi-ngí	" "
Bandi	pələ-íi	" "	koŋi-ngí	" "
Loma	pələ-í	" "	kómi-gi	" "
Kpelle ¹⁵	b-béré-í	" "	g-gomín	" "

Because of the broad surface distribution of the definite suffix in SWM, the accuracy of the label "definite" is questionable. For example, in the Central SWM languages, nouns in citation may appear only with the definite suffix. In Kpelle, nouns may be cited in the indefinite, without the definite suffix, as well. When these indefinite nouns occur sentence finally, they provide examples of noun stems uninfluenced by following tones. Definite nouns, too, are useful to the study of SWM tone, for they provide examples of noun stems followed by a high tone.

3.52 The demonstratives 'this' and 'that' require a preceding definite suffix. Because the demonstrative suffixes never directly affix to the noun, they add little to the understanding of the tonal behavior of SWM nominals. Below is a listing of the surface forms of these suffixes in the various SWM languages.

Demonstratives (using *péré house)

	this house	that house
Mende	pé.é-í-ní	pé.é-í-ná
Loko	péré-í-ndí	péré-í-ná
Bandi	pelé-í-sí	pelé-í-ná
Loma	pélé-í-ní	pélé-í-nu
Kpelle	bbéré-í-ŋí	bbéré-í-tí

3.53 Most SWM languages have two plural suffixes, described here simply as plural₁ and plural₂¹⁶.

	Plural ₁	Plural ₂
Mende	nga	sia
Loko	nga - a	iŋ
Bandi	nga - a	ti(ní) ¹⁷
Loma	gá - á	tí
Kpelle	ŋà	none

The plural₁ suffix has two allomorphs: Loko and Bandi nga and Loma -gá following strong conditioning nouns and Loko, Bandi, and Loma -á following weak conditioning nouns. The Mende plural₁ suffix is always -nga,¹⁸ the Kpelle suffix always -ŋà.

Plural₁ in Loko is restricted exclusively to animate nouns and is always followed by the definite and plural₂

suffixes. The plural of Loko inanimate nouns is formed by adding the definite suffix and plural₂ to the noun.

Loko	ndámá-nga-í-i	'the crocodiles'
	péré-í-i	'the houses'

The Bandi plural₁ suffix occurs only with familial nouns. The plural of Bandi familial nouns, as with all other Bandi nouns, requires the definite suffix and plural₂.

Bandi	ndéxé-á-í-ti	'the brothers or his brothers'
	ndamba-ngí-ti	'the crocodiles'

While a "double plural" is common among Mende animate nouns, any Mende noun may use the plural₁ suffix alone with the meaning of 'indefinite plural'.

Mende	ndámá-nga-í-sia	'the crocodiles' ¹⁹
	ndámá-nga	'some crocodiles'

Indefinite plurals also occur in Kpelle and Loma.

Loma	dábá-ga	'some crocodiles'
Kpelle	fáí-ŋa	'some crocodiles'

The definite plural in Mende, Loma, and Kpelle is formed in different ways. In Mende, the definite suffix is followed by plural₂ with, as mentioned above, an optional plural₁ in the case of animate nouns. The definite plural of Loma is formed by adding plural₂ after the definite suffix. Kpelle, having no plural₂ suffix, adds the definite suffix to plural₁ to produce the definite plural.

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Mende:	nika(-nge)-í-sia	'the cows'
	Pé. é-í-sia	'the houses'
Loma:	nika-í-ti	'the cows'
	péle-í-ti	'the houses'
Kpelle:	níná-pà-i	'the cows'
	bberé-nà-i	'the houses'

The plural suffix is useful in the study of the tonal behavior of SWM nominals, for it provides examples of the noun stem directly followed by a low or non-high tone.

354 Southwestern Mende has three categories of possession: alienable, corporal, and familial. Each of these categories displays distinct semantic, syntactic, and phonological properties. Semantically, both corporal and familial possession express inalienable relationships: corporal -the possession of body parts (e.g., Mende: nya-gówé -í 'my foot'); familial - the expression of relationships with blood relatives in existence at birth (e.g., Mende nya-kénýa 'my uncle'). Alienable possession expresses the possession of an acquired object (e.g., my house, my mortar).

Very few exceptions to these semantic criteria exist. Blood and urine, in Loma, for example, are alienable. In Mende ndiámó 'friend' functions as a familial noun.

The possessive pronouns used in each of these kinds of possession show a great deal of variation within each language. This is particularly true of the first and third persons singular. Some of this variation in corporal possession is presumably the result of the fusion of the basic pronoun

and a following particle. Interestingly, in each of the SWM languages, the corporal possessive pronouns are identical in form to the direct object pronouns and appear to be morphologically the simpler of the two. Other SWM pronouns, such as alienable possessive pronouns and subject pronouns, appear to have had something added to them.

Familial Possession (using *léxé 'brother')

	Mende	Loko	Bandi	Loma	Kpelle
1 sg	nyá-ndéwé	ní-ndéxé	ní-ndéxé	déxé	néxè
2 sg	bí-ndéwé	bí-ndéxé	í-ndéxé	e-léxé	í-léxè
3 sg ₁	ngi-ndéwé	ngi-ndéxé	ngi-ndéxé	déxé	néxè
3 sg ₂ ²⁰	ndewe	ndexé	- - -	- - -	- - -
1 pl in	- - -	ni-ndéxé	ni-ndéxé	dé-léxé	- - -
1 pl ex	mu-ndéwé	mu-ndéxé	mu-ndéxé	gé-léxé	kú-léxè
2 pl	wu-ndéwé	wú-ndéxé	wú-ndéxé	wo-léxé	ká-léxè
3 pl	ti-ndéwé	ti-ndéxé	ti-ndéxé	tí-léxé	ddí-léxè

Corporal Possession (using *ko.o 'belly')²¹

	Mende	Loko	Bandi	Loma	Kpelle
1 sg	nyá-go.o-í	nyá-xó. -í	kó.o-í	ko.o-gí	ń-go.o
2 sg	bí-go.o-í	bí-xó.o-í	í-xó.o-í	e-xo.o-gí	í-ko.o
3 sg	ngí-go.o-í	alá-xo.o-í	ko.o-í	kó.ó-gí	g-go.o
1 pl in	- - -	ni-xó.o-í	ni-xó.o-í	dé-xó.o-gí	- - -
1 pl ex	mú-go.o-í	mu-xó.o-í	mu-xó.o-í	gé-xó.o-gí	kú-ko.o
2 pl	wú-go.o-í	wú-xó.o-í	wú-xó.o-í	wo-xo.o-gí	ká-ko.o
3 pl	tí-go.o-í	tí-xo.o-í	ti-xó.o-í	ti-xó.o-gí	ddí-ko.o

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Alienable Possession (using *péré 'house')

1 sg	nyá-bé.é-í	ní-béré-í	ní-vélé-í	na-pélé-í	ná-péré-í
2 sg	bí-bé.é-í	bí-béré-í	í-vélé-í	ya-bélé-í	í-péré-í
3 sg	ngi-bé.é-í	ngi-béré-í	ngi-vélé-í	ná-pélé-í	no-péré-í
1 pl in	- - -	ni-béré-í	ni-vélé-í	dá-bélé-í	- - -
1 pl ex	mu-bé.é-í	mu-béré-í	mu-vélé-í	gá-bélé-í	kú-péré-í
2 pl	wu-bé.é-í	wú-béré-í	wú-vélé-í	wa-bélé-í	ká-péré-í
3 pl	ti-bé.é-í	ti-béré-í	ti-bélé-í	wa-bélé-í	ddí-péré-í

3.55 Nominal Compounds in Southwestern Mande are formed by juxtaposing two nouns, the first constituent noun modifying the second.

Me	yáá	water	fé.é	pot	nja+vé.é-í	the water pot
Lk	tókpó	palm tree	laxá	leaf	tókpó+laxá-í	the palm leaf
Ba	nyahá	woman	pélé	house	nyaha+vélé-í	the woman house
Lo	bowa	knife	taga	nest	bówa+laxá-í	the knife sheath
Kp	té.é	chicken	galóòn	egg	té.é+galon	the chicken egg

In Central SWM, when the first constituent is a weak conditioning noun, as in the above examples, the second constituent begins with a weak initial consonant (see 3.2). When the first constituent is a strong conditioning morpheme, as in the following examples, the second constituent begins with a strong consonant.

Me	kó mí	bee	pé.é	house	kó mí+bé.é-í	the bee house
Lk	kó ðí	bee	péré	house	kó ðí+péré-í	the bee house
Ba	kó ðí	bee	pélé	house	kó ðí+pélé-í	the bee house
Lo	kó mí	bee	pélé	house	kó mí+pélé-í	the bee house
Kp	kó mí	bee	péré	house	g-gómim+péré-í	the bee house

Noun + verb and verb + noun compounds are also possible, though much less frequent. Furthermore, combinations of nouns and what we traditionally call adjectives function phonologically in the same way as these nominal compounds. For this reason I have classed noun and adjective sequences under the heading of nominal compounds.

Mende	pé.é	house	wova	old	pé.é+wóvɛ-í	the old house
	mahaá	chief			maha+wóvɛ-í	the old chief
Loko	péré	house	oha	old	péré+ohá-í	the old house
	maháŋ	chief			mahá+ngóhá-í	the old chief
Bandi	pélé	house	póló	old	pélé+vóló-í	the old house
	masáŋ	chief			masa-póló-í	the old chief
Loma	pɛɛ	house	kooza	old	pélé+wooza-gí	the old house
	masaŋ	chief			masá+kooza-gí	the old chief
Kpelle	péré	house	póló	old	bbéré+póló-í	the old house
	kálòŋ	chief			kkálòm+póló-í	the old chief

Nominal compounds in SWM all involve a tone-lowering rule followed by at least one tone-copying rule. Tonal compounds, therefore, provide useful information about the tonal behavior of SWM nominals.

Footnotes Chapter 3

1. All consonants of the heavy series belong to the natural class that is [-nasal] and [+voice].
2. The segments b and ɓ appear to be [+sonorant] rather than [-sonorant].
3. The use of a period (.) between two vowels indicates that the sequence v.v is long. Long vowels frequently arise in Southwestern Mande from a deleted medial consonant, such as Mende: pɛ.ɛ PSWM *pɛɛ 'house'.
4. Mende also has an s ~ ʃ alternation. This is a recent development for Proto-SWM *s becomes h in Mende.
5. More precise meanings for these prefixes are provided in the following chapters where they occur (see 4,5,6, 7, and 8).
6. The diagraph ny in accordance with Southwestern Mande orthography represents a palatal rather than the sequence of an alveolar nasal followed by the glide ɲ.
7. The rule sequence, Nasal Absorption followed by Gemination, is a bleeding order (9.2). A reordering of these rules, so that Gemination precedes Nasal Absorption, produces a feeding order. Consequently this reordering can be characterized as a simplification and natural development. The Kpelle dialect spoken in Bopolu (Welmers 1964) reflects this reordering, for here, the heavy consonants are also geminate but non-nasal. Nasal Absorption still reduces geminate nasals, however.
8. Voiceless geminate consonants are more fortis in articulation than non-geminates, and have a slightly longer duration.
9. Voiced geminate consonants are noticeably longer in duration than non-geminate consonants. Accordingly, weak geminate consonants have also been described as having heavy voicing (Welmers 1964 and Bird 1971).
10. At this point, the structural description of the Nasal Absorption rule also broadened to include morpheme final nasals.
11. The term "Low" is used here in place of Non-High to save space.
12. Again, the "low" of Low Tone Advancement is technically [-high -low].

13. In chapter 2 (footnote 1), I proposed the symbols q and v in order to distinguish between tone-bearing and non-tone-bearing segments. Thus q stands for a segment which cannot bear tone, while v stands for a segment which can.
14. Loko also has a definite suffix -ná, derived from the demonstrative suffix -na 'that'. This definite suffix, while more common than -í~ngí in normal usage, may not, unlike the other definite suffixes, appear before the demonstrative suffix -ndí 'this'.
15. The voicing and gemination of the initial consonants of these Kpelle examples is a result of the Post-Nasal Voicing and Nasal Absorption rules and the prefix of preference n̄-, (see 8.2).
16. For more precise explanations of the meaning of plural in these languages see the above mentioned Southwestern Mande descriptions.
17. The ní component of the Bandi plural₂ suffix -ti (ní) is optional, but is generally not used when a demonstrative is present.
18. The loss of the morpheme final nasal ...n threw the Mende suffix allomorphic alternations into considerable confusion. Mende ultimately settled upon the -í of the ngí~í alternation and the -nga of the -nga~a alternation. Spears (1967b) reports this suffix with a long vowel (i.e., nga.a).
19. Mende has twoumlaut rules. The first rule fronts an a to ɛ when preceding the definite suffix -í.
- nyahaa-í -----> nyahé-í 'the woman'
masa-nga-í-sia ----> masa-ngé-í-sia 'the chiefs'
- The second rule fronts and unrounds a morpheme-final back vowel when followed by the definite suffix -í, provided that the consonant preceding the back vowel is one of the following: w, y, l, nd or n.
- | | with fronting | | without fronting | |
|-------------|---------------|-----------|------------------|--------|
| kɔtuú-í --> | kɔti-í | the axe | hakuú-ú --> | haku-í |
| | | | | turtle |
| mbóló-í --> | mbolé-í | the knife | navó-í --> | navó-í |
| | | | | money |
| bɔndɔ-í --> | bɔndɛ-í | the okra | nɔkɔ-í --> | nɔkɔ-í |
| | | | | elbow |
- The second Mende rule may be related to a Bandi rule which inserts a non-syllabic segment with the fronting of the definite suffix í, and height of the preceding vowel, in the same environment.

Bandi	mbóló-í	----→	mbóló ^e -í	'his neck'
	kpáwó-í		kpáwó ^e -í	'the bridge'

More limited fronting rules also occur in Kpelle (Welmers 1969) and in Loma (Sadler 1951). A similar event also occurs in Susu (Houis 1963:44).

20. Third singular₁ and third singular₂ are paraphrases. Third singular₂ is limited to Mendé and Loko familial possession.
21. The morpheme meaning 'belly' is a strong-conditioning noun in Loma, but a weak-conditioning noun in all the other SWM languages. Both Bandi and Loma contain more examples of class shifting between strong- and weak-conditioning than do the other SWM languages (see 14.4).

Chapter 4

Mende Tone

4.0 Mende [mɛndé], the major language of the southern half of the Republic of Sierra Leone, is expanding as a lingua franca to the east, south and west. In fact, some peoples who previously spoke Vai, Bulom or Krim now speak Mende as a first language. Further to the east, in the Republic of Liberia, Mende had been reported as a lingua franca in Bandi and Kissi speaking areas, but since the establishment of more stringent border controls between the Republics of Guinea, Sierra Leone, and Liberia, the influence of Mende outside of Sierra Leone has gradually lessened.

The most frequently mentioned dialects of Mende are Kpa to the east and Ko [kɔ] to the west. Ko Mende is the dialect on which all of the published linguistic descriptions of Mende have been based and it is rapidly becoming the standard Mende dialect. More linguistic accounts have been published on Mende than on any of the other SWM languages. The major works include: Summer (1917), Aginsky (1935), Crosby (1944), Innes (1962, 1963, and 1967), and Spears (1967a).

The study of tone in Mende has a long history of development. Landmarks include Aginsky's lengthy exemplification of

tonal paradigms, Crosby's tonal classification, and Spears' morphonemic tone representation system, the latter being very similar to the systematic phonemic representations proposed independently by Leben (1971) and Dwyer (1971).

Additional information for this analysis was supplied by Mr. Samuel Lamin and Mrs. Kadi Lamin, both speakers of the Ko dialect of Mende.

4.1 Rules

The following listing and discussion presents the form and ordering of the Mende phonological rules used in this chapter. In this listing, the Consonant Rules have been ordered ahead of the Downdrift and Contour Reduction rules. This has been done to emphasize that the Downdrift and Contour Reduction rules behave differently from other South-western Mende phonological rules in a number of ways (see 10.7 and 10.8).

4.11 Lowering

This rule, which applies to nominal compounds, alienable possessives, and to the his₂ familial possessive (4.41), changes all the lexical tones of the second and succeeding constituents of these constructions to non-high.

Lowering

$\acute{v} \rightarrow v / [(\dots+)_{1} \dots \text{---} \dots]$

Nominal Compounds
Alienable Poss.
His₂ Familial Poss.

(where $(\dots+)_{1}$ indicates one or more constituent morphemes)

4.12 High Tone Copying

This rule, like Lowering, applies to nominal compounds and alienable possessives. It advances a morpheme-final high tone of the first constituent, if present, onto the first syllable of the second constituent.

High Tone Copying (High Copy)

$v \rightarrow \acute{v}v / \left[\dots \acute{v}+(o) _ \dots \right]$ Nominal Compounds
Alienable Poss.

In 4.52, evidence is given to support my claim that this rule produces a falling tone rather than a simple high tone.

4.13 High Loss

Short-rising tones are reduced to non-high when followed by a high tone (see 4.3).

High Loss

$\acute{v} \rightarrow v / v_ (o) \acute{v}$ (in 2.4 \underline{vv} is defined as
equivalent to \underline{v})
(e.g., $v\acute{v}o\acute{v} \rightarrow vv o\acute{v} \rightarrow vco\acute{v}$)

4.14 Stress

Except for class 5 nouns, stress is assigned to the first high tone in the Mende nominal phrase:

Stress_a

$\acute{v} \rightarrow [+stress] / \left[(ov)_o(o) _ \dots \right]$ Noun
Phrase

Class 5 nouns, which do not contain a high tone, are stressed on the first syllable.

Stress_b

$v \rightarrow [+stress] / \left[o _ ov \dots \right]$ Noun Phrase

Because stress does not directly affect Mende tone, it is not marked in this chapter, and the stress rule is not demonstrated in the derivations.

4.15 Consonant Rules (C Rules)

All of the rules necessary to derive the Mende surface forms of initial consonants from their underlying consonants are summarized in Figure 4-1. For each series, the first column represents the underlying consonants, the second column, the corresponding weak consonants, and the final column, the corresponding strong consonants.

Light Series			Heavy Series			Nasal Series		
Base	Weak	Strong	Base	Weak	Strong	Base	Weak	Strong
p	$\begin{cases} w/_Vbk \\ b/_V_bk \end{cases}$	p	b	b	mb	m	m	m
f	v	f						
t	l	t	l	l	nd	n	n	n
s	j	s	y	y	nj	ny	ny	ny
k	g	k	ɕ	y	ng	ŋ	ŋ	ŋ
kp	gb	kp	w	w	ng			

The remaining Mende initial consonants: b, d, l, y, w, and h, do not mutate

Figure 4-1: Mende consonant alternation.

Mende strong initial consonants occur in the leading morpheme of nominal constructions and weak initial consonants occur in succeeding morphemes. There are a number of morphemes which always begin with a strong consonant (including all familial nouns), while other morphemes always begin with a weak consonant. Those morphemes containing exceptions

to the general consonant rules must be marked with a diacritic feature which I call [no weakening].

4.16 Downdrift

Downdrift adds the feature [+lowered] to any tone-bearing segment having a tonal value opposite that of the preceding tone-bearing segment.

Downdrift

[α high] ----> [+lowered] / [$-\alpha$ high] ____

4.17 Contour Reduction

Contour Reduction applies to all complex tones, except for sentence-final falling tones. This rule reduces these complex tones to high by changing the [-high] feature value to [+high].

Contour Reduction (Cont Red)

v ----> $\acute{v} / \left\{ \overline{\underset{v}{v}} \dots \right\}$ (where $\overline{\underset{v}{v}} = \acute{v}$ see 2.4)

4.2 Base Forms

The base tones of the six Mende tonal classes are as follows:

	pattern	bisyllabic noun	monosyllabic noun
class 1	(c \acute{v})c \acute{v}	tókpó palm tree	lá mouth
2	(cv)c \acute{v}	peleé road	yeé mother
3	(cv)c \acute{v} v	getée mortar	búu owl
4.	c \acute{v} cv	káli hoe	
5.	cvcv	bele trousers	
6.	cvc \acute{v}	fandé thread, cotton	

4.21 The final tone of class 2 nouns has been called polarized (Spears 1967 a&b), a description which aptly captures the observation that this tone has the opposite (polar) tonal value from that of the following tone; it is high before non-high tones and non-high before high tones. The term "polarized" should be understood as a description of the phenomenon rather than an explanation of the process involved.

Previous treatments of this tone in Mende (Leben 1971 and Dwyer 1971) have independently proposed that its base tone be represented as a sequence of a non-high followed by a high tone. The need for a final high tone component in this tone is demonstrated in section (4.5) and the need for an initial non-high tone component in this tone is demonstrated in section (4.41).

4.21 The base forms of the Mende possessive pronouns are as follows:

my	nyá	our	nuú
your sg.	bí	your	wuú
his ₁	ngí	their	tí
his ₂	[+lowering]		

Both 'my' and 'your sg.' are marked with a diacritic feature which blocks High Tone Copying (see 4.43). Also, as far as I can tell, his₁ and his₂ are synonymous. Distributionally, his₂ is limited to familial nouns (see 4.41).

His₂ has no obvious segmental components and is detected by its effect of lowering the tones of the noun it possesses.

4.3 Nominal Suffixes

4.31 The Indefinite Singular

The derivation of the surface tones of constructions in which the noun is directly followed by the nominal suffixes requires the operation of the High Loss, Consonant Rules, Downdrift, and Contour Reduction rules. Three noun-suffix constructions are described in this section: the indefinite singular (the noun followed by no suffix), the indefinite plural (the noun followed by the non-high-tone suffix -nga) and the definite singular (the noun followed by the high-tone definite suffix ɛ́).

The first of these examples, the indefinite singular, provides an example of the noun not followed by any suffix. The surface tones of the six tone classes in the indefinite singular when they occur sentence-finally are as follows:

Base	Class	Indefinite singular(#S=sentence-finally)	
tókpó	1	tókpó #S	a palm tree
pelee	2	pele #S	a road
ɣetée	3	ngetée #S	a pestle
káli	4	káli #S	a hoe
bɛle	5	bɛle #S	a pair of trousers
fandé	6	fandé #S	a thread

The rising tone of class 2 nouns is reduced to high by the Contour Reduction rule; the falling tone of class 3 nouns is usually reduced to high by the same rule except, as it is here, when it occurs sentence-finally. Classes 2, 3 and 6 also undergo the Downdrift rule, as shown in the

following derivations:

	Class 1	Class 2	Class 3
Gloss	a palm tree	a road	a pestle
Base	tókpó #S	peleé #S	ɣetée #S
1. Lowering			
2. High Copy			
3. High Loss			
4. C Rules ¹			ngetée #S
5. Downdrift		peleě #S	ngetěe #S
6. Cont Red		pelě #S	
Surface	tókpó #S	pelě #S	ngetěe #S
	Class 4	Class 5	Class 6
Gloss	a hoe	a trousers	a thread
Base	káli #S	bele #S	fandé #S
1. Lowering			
2. High Copy			
3. High Loss			
4. C Rules			
5. Downdrift			fandě #S
6. Cont Red			
Surface	káli #S	bele #S	fandě #S

4.32 The Indefinite Plural

When the Mende noun classes are followed by the indefinite plural suffix -nga, the following surface tonal patterns occur:

Class 1	tókpó-nga	some palm trees
2	pele-nga	some roads
3	ngetě-nga	some pestles
4	káli-nga	some hoes
5	bele-nga	some trousers
6	fandě-nga	some thread

The only difference between the derivation of these tonal patterns and the derivation of the tonal patterns of the indefinite singular is that the Contour Reduction rule applies to the final syllable of class 3 nouns which are followed by the indefinite plural suffix because they are not in a sentence-final position. The Contour Reduction rule reduces the falling tone to high.

Gloss	some pestles
Base	ɣetée-nga
1. Lowering	
2. High Copy	
3. High Loss	
4. C Rules	ngetée-nga
5. Downdrift	ngetée-nga
6. Cont Red	ngete-nga
Surface	ngete-nga

4.33 The Definite Singular

When the noun is followed by the high tone definite suffix -í, the surface tonal patterns of the definite form of the six tonal classes are as follows:

Class	1	tókpó-í	the palm tree
	2	pele-í	the road
	3	ngeté-í	the pestle
	4	káli-í	the hoe
	5	bélé-í	the trousers
	6	fandé-í	the thread

The derivation of the surface tones of the definite form of class 2 nouns requires the application of High Loss and Contour Reduction. The High Loss rule reduces the rising

tone of class 2 nouns to non-high when followed by a high tone, such as the definite suffix. The Downdrift rule then applies as in the indefinite singular and plural.

Gloss	the road
Base	peleé-í
1. Lowering	
2. High Copy	
3. High Loss	pele-í
4. C Rules	
5. Downdrift	pele-í̃
6. Cont Red	
Surface	pele-í̃

The interaction of the rising tone of class 2 nouns and the High Loss rule causes the phenomenon known as polarization where the surface tones of the rising tones are non-high when preceding a high tone (e.g., pele-í̃ 'the road ') and high when preceding a non-high (e.g., pele-nga 'roads ').

In order to produce this alternation, the High Loss rule must be ordered before both Contour Reduction and Downdrift. Were High Loss to follow, the Contour Reduction rule would reduce all rising tones to high so that no alternation could result. Also, the High Loss rule must be ordered ahead of Downdrift so that the downstepped high tone is not inadvertently deleted.

Gloss	the road	
Base	peleé-í	
**Downdrift	**peleé-í̃	
**High Loss	**pele-í̃	(the definite suffix should be <u>-í̃</u>)

When class 3 nouns are followed by a high tone, first the high tone is downstepped because of the non-high-toned component of the preceding falling tone. Then, this non-high-toned component is deleted by the Contour Reduction rule. The result of these processes is a surface sequence of high downstepped-high.²

Gloss	the pestle
Base	ɣetée-í
1. Lowering	
2. High Copy	
3. High Loss	
4. C Rules	ngetée-í
5. Downdrift	ngetée-í̃
6. Cont Red	ngeté-í̃
Surface	ngeté-í̃

The derivation of the surface tonal patterns of class 1 nouns does not require the operation of any tonal rules, while the derivation of the remaining examples (classes 4, 5, and 6) requires the operation of the Downdrift rule only.

Class	1	4	5	6
Gloss	the	the	the	the
	palm tree	hoe	trousers	thread
Base	tɔkpɔ-í	kali-í	bɛɛ-í	fandɛ-í
1. Lowering				
2. High Copy				
3. High Loss				
4. C Rules				
5. Downdrift		káli-í̃	bɛɛ-í̃	fandɛ-í̃
6. Cont Red				
Surface	tɔkpɔ-í̃	káli-í̃	bɛɛ-í̃	fandɛ-í̃

4.4 Possessives

4.41 Familial Possessives

Familial possession concerns the relationships between self and kin. Syntactically, this construction involves a pronoun followed by a familial noun which begins with a strong initial consonant.

	grandmother	uncle	mother	father	elder brother
my	nyá-mamá	nyá-kénýa	nyá-njé	nyá-keké	nyá-ngóo
your	bí-mamá	bí-kénýa	bí-njé	bí-keké	bí-ngóo
his ₁	ngí-mamá	ngi-kénýa	ngí-njé	ngí-keké	ngi-ngóo
his ₂	mama	kenya	nje	keke	ngo
our	mú-mamá	mu-kénýa	mú-njé	mú-keké	mu-ngóo
your	wú-mamá	wu-kénýa	wú-njé	wú-keké	wu-ngóo
their	tí-mamá	ti-kénýa	tí-njé	tí-keké	ti-ngóo

The alternation of the surface tone of 'his₁', 'our', 'your pl.', and 'their' is due to the effects of both the High Loss and the Contour Reduction rules on an underlying rising tone.

Gloss	our grandmother	our uncle
Base	muú-mamá	muú-kénýa
1. Lowering		
2. High Copy		
3. High Loss		mu-kénýa
4. C Rules		
5. Downdrift	muú-mamá	mu-kénýa
6. Cont Red	mú-mamá	
Surface	mú-mamá	mu-kénýa

When a downstepped high tone is derived in the phrase-initial position, it will not be detected in the surface form, for, in order to detect a downstepped high tone, it is necessary to know the level of the preceding pitch. This is why wú-mamá 'your mother' was not recorded with an initial downstepped high in the familial possessive paradigm.³

The pronoun of the his_2 familial possessive has no segmental values (surface or underlying), although it apparently contains in its underlying representation the diacritic feature [+lowering], which signals that the base tones of the following possessed (familial) nouns undergo the Lowering rule.

Gloss	his_2 grandmother	his_2 uncle
Base	[+lowering]-mamá	[+lowering]-kénýa
1. Lowering	[+lowering]-mama	[+lowering]-kenya
2. High Copy		
3. High Loss		
4. C Rules		
5. Downdrift		
6. Cont Red		
Surface	mama	kenya

Because the morphemes njeé 'mother' and ngón 'elder brother' are monosyllabic, their contour tones are simultaneously morpheme-initial and morpheme-final. This provides an important opportunity to observe both the initial and final component of Mende contour tones. The morpheme ngón has a short falling tone with a final non-high component. When this morpheme occurs sentence-finally, it appears on the

surface with a falling tone which is identical to the falling tone of kondáa, 'mortar'. The initial component of the tone of ngón is high, as the following two arguments demonstrate. First, when a high tone precedes a short falling tone, the pitch levels of the high tone and the onset of the following falling tone are identical. Secondly, when a short rising (polarized) tone precedes a short falling tone, the rising tone undergoes High Loss and therefore is realized on the surface as a non-high tone as in:

ngi-ngón 'his elder brother' and ngi-kénýa 'his uncle'.

Gloss	his elder brother	his uncle
Base	ngíí-ngón	ngíí-kénýa
1. Lowering		
2. High Copy		
3. High Loss	ngi-ngón	ngi-kénýa
4. C Rules		
5. Downdrift	ngi-ngón	ngi-kénýa
6. Cont Red		
Surface	ngi-ngón	ngi-kénýa

In order for High Loss to reduce the rising tone of ngíí to non-high in 'his elder brother', the initial tone component of ngón 'elder brother' must be high.

As the morpheme ngón demonstrates the need for an initial high toned component in a short falling tone, the morpheme níeé 'mother' demonstrates the need for an initial non-high component in a short rising (polarized) tone. The tonal behavior of níeé in nominal compounds demonstrates that this

morpheme has the kind of tonal patterning that would be expected of an underlying rising (polarized) tone.

nje+kóhu-í	'half-brother or sister' ⁴
nje+wúle-í	'small mother (i.e., aunt)' ⁵
nje+mó-i	'mother person (i.e., one whose mother is still living)'

These surface forms can be derived by the existing rules, if the base form of 'mother' has a short rising tone.

Gloss	aunt	mother person
Base	njeé+wúló-í	njeé+mó-í
1. Lowering	njeé+wulo-í	njeé+mó-í
2. High Copy	njeé+wúulo-í	njeé+móo-í
3. High Loss	nje+wúulo-í	nje+móo-í
4. C Rules		
5. Downdrift	nje+wúulo-í	nje+móo-í
6. Cont. Red	nje+wúlo-í	nje+mó-í
Surface	nje+wúlo-í	nje+mó-í

This evidence, then, suggests that njeé must have an underlying short rising tone, the same as that found on the last syllable of peléé 'road' or mahéé 'chief'. Because njeé is a monosyllabic noun, this rising tone is both a morpheme-initial tone and a morpheme-final tone. This makes it possible to demonstrate that the initial component of the rising tone must be non-high as can be seen in the following examples:

nyá-njé	my mother	ngí-njé	his mother
---------	-----------	---------	------------

If the downstep in 'my mother' results from the loss of a non-high tone following Downdrift, then this non-high tone must belong either to the pronoun ***nyáa** or the morpheme mother **níeé**. If the non-high tone belongs to the pronoun, then any high tone following that pronoun should be downstepped. Because this does not happen, as in the following where a high tone following the pronoun, **nyá**, is not downstepped, the pronoun **nyá** cannot be responsible for the downstep.

nyá-kénýa my uncle **nyá-ng'ón** my brother,

Therefore, the non-high tone must be associated with the noun 'mother'. If **níeé** has a short underlying rising tone, then the downstep of the above examples can be derived by the existing Mende rules.

Gloss	my mother	his mother
Base	nyá-njeé	ngíí-njeé
1. Lowering		
2. High Copy		
3. High Loss		
4. C Rules		
5. Downdrift	nyá-njeé	ngíí-njeé
6. Cont Red	nyá-njé	ngí-njé
Surface	nyá-njé	ngí-njé

The initial non-high tone of **níeé** also explains why a preceding rising tone such as **ngíí** 'his' is realized phonetically as a (downstepped) high tone. This is because the initial non-high tone of **níeé** blocks the High Loss rule.

By treating the 'polarized' tone as a phonemic short rising tone, even though it never appears as such on the surface, it is possible to bring together a number of diverse facts : downstep, polarization, and the otherwise peculiar tonal behavior of nieé. This is, after all, the purpose of a generalization.

4.42 Corporal Possessives

Corporal possession differs from familial possession segmentally in that the possessed nouns begin with a weak rather than a strong initial consonant. Also, corporal possession has no his₂ paraphrase. Unlike alienable possession (4.43), corporal possession does not involve Lowering and High Tone Copying.

	mbóló	neck	tokoó	hand	kongáa	occiput
my	nyá-bólé-í		nyá-loko-í		nyá-gongé-í	
your	bí-bólé-í		bí-loko-í		bí-gongé-í	
his	ngi-bólé-í		ngi-loko-í		ngi-gongé-í	
our	mu-bólé-í		mú-loko-í		mú-gongé-í	
your	wu-bólé-í		wú-loko-í		wú-gongé-í	
their	tí-bólé-í		tí-loko-í		tí-gongé-í	

The tonal behavior of the pronouns in corporal possession is identical to the tonal behavior of the pronouns used in familial possession.

4.43 Alienable Possessives

Alienable possession differs tonally from the two types of inalienable possession in its use of the Lowering and High Tone Copying rules. To show this more graphically,

the boundary symbol (+) has been used in place of (-). The existence of Lowering can be seen by the lack of distinctive tone in possessed alienable nouns. Thus, no matter what the lexical tone of the noun, the surface tones of these nouns in alienable possession are always determined by the preceding pronoun.

Base	gá ^á mat	gí ^á dog	peleé road
my	nyá+yálc-í	nyá+yílc-í	nyá+bele-í
your	bí+yálc-í	bí+yílc-í	bí+bele-í
his	ngi+yálc-í	ngi+yílc-í	ngi+bele-í
our	mu+yálc-í	mu+yílc-í	mu+bele-í
your	wu+yálc-í	wu+yílc-í	wu+bele-í
their	ti+yálc-í	ti+yílc-í	ti+bele-í

In these possessives, the High Tone Copying rule applies if and only if the base form of the possessive pronoun has a short rising tone (ngí 'his', muí 'our', wuí 'your pl', and tíí 'their') and not if the base form of the pronoun is high (nyá 'my' and bí 'your sg.'). The High Tone Copying rule is formulated so that it advances either a morpheme-final simple high tone or the high-toned component of a short rising tone on the basis of the tonal behavior of nominal compounds (see 4.5). Unless either this rule or the base form of the pronouns nyá and bí is modified, the high tones of these pronouns will be incorrectly copied onto the first syllable of the possessed noun and produce the incorrect ***nyá+yálc-í** 'my mat', for example.

This difficulty could be overcome with the establishment

of a separate tone copying rule for alienable possessives. This rule would copy only the high component of a short rising tone and not a simple high tone. With two separate rules, the similarity of these tone copying events is obscured: both rules follow Lowering and precede High Loss, both rules are mutually exclusive, and both rules are contour-producing. The only difference between these two rules is that High Tone Copying does not apply in the case of nyá and bí.

This fact can be stated more simply by providing these pronouns with falling tones *nyá and **bí when they appear in alienable possession. Because these allomorphs end in a non-high tone, High Tone Copying would not apply, then Contour Reduction would reduce the falling tone to a simple high and the correct surface forms would be derived (cf. Spears 1967b). Yet, this approach necessitates a special ad hoc statement in order to provide such an allomorph. Furthermore, the approach involves what Kiparsky (1968) would call a purely diacritic use of a phonological feature. What seems to be needed is a diacritic feature, such as [Minus High Tone Copying], which can be added to the base form of nyá and bí to block the High Tone Copying rule. This diacritic feature also expresses only that which is synchronically known, that nyá and bí do not undergo High Tone Copying. Historically bí appears to have been borrowed by Proto-Northern SWM (see Figure 9.1). In SWM, borrowed morphemes have a tendency to resist tone spreading (see 6.2). That

Mende bí is a borrowed morpheme may explain historically why it does not undergo High Tone Copying. Nyá, on the other hand, corresponds to Loko nyaa (with a falling tone), and this fact may explain why Mende nyá does not undergo High Tone Copying.

4.5 Nominal Compounds

4.51 The tonal behavior of nominal compounds illustrates the application and ordering of all of the Mende tone rules. In nominal compounds, the lexical tone of the second constituent is completely erased and replaced either by a high non-high or a non-high non-high tonal pattern. When the first constituent of a nominal compound is a class 1, 2 or 6 noun, the high non-high tonal pattern appears on the second constituent. When the first constituent of a nominal compound is a class 3, 4 or 5 noun, the tones of the second constituent are all non-high. In the following examples, the second constituent is the adjective wóya 'old'. The fronting of a to ɛ before the definite suffix -í is discussed in chapter 3, footnote 17.

class	base	gloss	compound	gloss
1	hálé	medicine	hálé+wóvɛ-í	the old medicine
	tókpó	palm tree	tókpó+wóvɛ-í	the old palm tree
2	peleé	road	pele+wóvɛ-í	the old road
	mahaá	chief	maha+wóvɛ-í	the old chief
3.	getée	pestle	ngetě+wóvɛ-í	the old pestle
	nyaháa	woman	nyahá+wóvɛ-í	the old woman
4	gíla	dog	ngíla+wóvɛ-í	the old dog
	káli	hoe	káli+wóvɛ-í	the old hoe
5	bele	trousers	bele+wóvɛ-í	the old trousers
	bolo	hat	bolo+wóvɛ-í	the old hat
6.	gbéhé	bench	gbéhé+wóvɛ-í	the old bench
	fandé	thread	fandé+wóvɛ-í	the old thread

Derivations of these compounds are given following further exemplification of the types of Mende nominal compounds.

The following examples further demonstrate that these tonal patterns are completely independent of the lexical tones of the second constituent and are completely dependent on the tonal class of the first constituent.

They also provide examples of true compounds or

noun₁ + noun₂ combinations.

Noun ₁		Noun ₂		Noun ₂		Noun ₂	
base	gloss	base	gloss	base	gloss	base	gloss
		hálé	medicine	kondáa	mortar	peleé	road
wúlú	tree	ngúlú+hále-í		ngúlú+gón-da-í		ngúlú+bele-í	
gíla	dog	ngíla+hále-í		ngíla+gón-da-í		ngíla+bele-í	
nyaháa	woman	nyahá+hále-í		nyahá+gón-da-í		nyahá+bele-í	
mahaá	chief	maha+hále-í		maha+gón-da-í		maha+bele-í	

While some of the above compounds may seem to be a bit strange, they were all elicited from and considered

acceptable by native speakers of Mende. When it is pointed out that the word glossed as 'tree' can also be glossed as 'wood' and that 'road' can also be glossed as 'path', most of these compounds no longer seem strange.

Nominal compounds in which the second constituent is a trisyllabic morpheme provide further exemplification of the tonal patterns imposed on the second constituent.

underlying	nyaháa+súkulu-í
surface	nyahá+sukulu-í
gloss	the woman's school
underlying	logboó+súkulu-í
surface	ndogbo+súkulu-í
gloss	the bush school
underlying	hálé+súkulu-í
surface	hálé+súkulu-í
gloss	medical school
underlying	soso+nikíli-í
surface	soso+nikili-í
gloss	Susu peanut
underlying	mendé+nikíli-í
surface	mendé+nikili-í
gloss	Mende peanut
underlying	pu+nikíli-í
surface	pu+nikili-í
gloss	English peanut (i.e., cashew)

The tonal patterns of the second constituent can be summarized as follows:

- 1) When the final tone of the first constituent is non-high, the tones of the second constituent are all non-high.
- 2) When the final tone of the first constituent is high, the first tone of the second constituent is high and all of the remaining tones are non-high.

The above generalization reflects the operation of two rules: the Lowering rule, which changes all the lexical tones of the second constituent to non-high, followed by the High Tone Copying rule, which advances a morpheme-final high tone of the first constituent onto the first syllable of the second constituent. Following these two rules, the Downdrift and Contour Reduction rules apply.

The Lowering rule can be seen in operation unaltered by the High Tone Copying rule when the first constituent ends in a non-high tone.

Gloss	old woman	old dog	old trousers
Base	nyaháa+wóvǎ-í	ǵíla+wóvǎ-í	bɛlɛ+wóvǎ-í
1. Lowering	nyaháa+wova-í	ǵíla+wova-í	bɛlɛ+wova-í
2. High Copy			
3. High Loss			
4. C Rules		ngíla+wova-í	
5. Downdrift	nyaháa+wova-í	ngíla+wova-í	bɛlɛ+wova-í
6. Cont Red	nyahá+wova-í		
Surface	nyahá+wovɛ-í	ngíla+wovɛ-í	bɛlɛ+wovɛ-í

The High Tone Copying rule must follow Lowering. Were this order reversed, the Lowering rule would obliterate the effects of the High Tone Copying rule.

The derivations of the tonal pattern of nominal compounds with a class 1, 2, or 3 noun as the first constituent require the use of High Tone Copying.

Gloss	old medicine(1)	old road(2)	old thread(6)
Base	hálé+wóvá-í	peleé+wóvá-í	fandé+wóvá-í
1. Lowering	hálé+wóva-í	peleé+wóva-í	fandé+wóva-í
2. High Copy	hálé+wóova-í	peleé+wóova-í	fandé+wóova-í
3. High Loss		pele+wóova-í	
4. C Rules			
5. Downdrift	hálé+wóova-í	pele+wóova-í	fandé+wóova-í
6. Cont Red	hálé+wóva-í	pele+wóva-í	fandé+wóva-í
Surface	hálé+wóvc-í	pele+wóvc-í	fandé+wóvc-í

High Loss must follow the High Tone Copying rule and precede Downdrift. Were it to precede High Tone Copying, the high tone in peleé would not be deleted.

Gloss	old road
Base	peleé+wóvá-í
1. Lowering	peleé+wóva-í
2. *High Loss	
3. High Copy	**peleé+wóova-í
4. C Rules	
5. Downdrift	**peleé+wóova-í
6. Cont Red	**peleé+wóva-í
Surface	**peleé+wóvc-í

4.6 Why High Tone Copying must be a Contour-Producing Rule

The Mende High Tone Copying rule has been written as a contour-producing rule, rather than a simple replacement of

a non-high tone by a high tone in order to account for two important facts about the tonal behavior of nominal compounds.

First, when an indefinite singular (suffixless) nominal compound having a monosyllabic second constituent occurs sentence finally, a surface falling tone is observed on this second constituent.

b ɛbó	'bush'	gomá	'minister bird'
kó	'war'	ló	'child'
ndogbo+g'oo	'bush-war'	goma+léo	'minister bird chick'

This falling tone is derivable by a contour-producing tone-copying rule and not by a simple replacement of non-high by high, as the following parallel derivations demonstrate.

	If the tone copying rule is contour-producing	If the tone copying rule is a replacement of non-high by high
Gloss	bush war	bush war
Base	logboó+kó	logboó+kó
1. Lowering	logboó+kó	logboó+kó
2. High Copy	logboó+kó	**logboó+kó
3. High Loss	logbo+kó	**logbo+kó
4. C Rules	ndogbo+g'oo	**ndogbo+g'oo
5. Downdrift	ndogbo+g'oo	**ndogbo+g'oo
6. Cont Red		
Surface	ndogbo+g'oo	**ndogbo+g'oo

The sentence-final position is the only environment in which the Contour Reduction rule does not reduce a falling tone. In all other environments, it reduces a falling tone

to a simple high tone. This leads to the second argument for the contour-producing status of the High Tone Copying rule. A high tone, such as that of the definite suffix -í, is downstepped when following a falling tone, regardless of whether the falling tone is underlying or derived.

Gloss	the woman	the bush war
Base	nyaháa-í	lɔgbɔɔ́+kɔ́-í
1. Lowering		lɔgbɔ́ɔ́+kɔ́-í
2. High Copy		lɔgbɔ́ɔ́+kɔ́ɔ́-í
3. High Loss		lɔgbɔɔ́+kɔ́ɔ́-í
4. C Rules		ndɔgbɔɔ́+gɔ́ɔ́-í
5. Downdrift	nyaháa-í	ndɔgbɔɔ́+gɔ́ɔ́-í
6. Cont Red	nyahá-í	ndɔgbɔɔ́+gɔ́-í
Surface	nyahá-í	ndɔgbɔɔ́+gɔ́-í

4.7 Summary

In this chapter, three important conclusions have been drawn. First, the tone-copying rule has been established as a contour-producing rule in Mende, rather than a simple assimilation rule (4.6). Secondly, the base form of the so-called "polarized" tone has been shown to be a short rising tone (4.41). And finally, if both rising and falling tones in Mende are regarded as sequences of two tone-bearing segments, a number of diverse facts about the tonal behavior of Mende can be brought together in a straightforward manner.

Footnotes

Chapter 4

1. 'C Rules' is an abbreviation of Consonant rules (see 4.15).
2. In order to produce the downstep in this situation, the non-high-toned component must not be deleted until following the Downdrift rule. Were a rule which converts falling tones to high to be placed before the application of Downdrift, the downstepped high tone would not arise (cf. Leben 1971).
3. This use of the term 'surface' refers to the form of a phonological string after it has undergone all of the binary phonological rules. There is a more 'surface' level of phonological representation at that point in the derivation after which all of the n-ary phonological rules have applied.
4. The word kohuú 'innards, womb' is most likely a compound of ko,oo 'belly' and hu 'in'. The term nje+kohu refers specifically to brothers and sisters of the same mother.
5. The morpheme wúlo is quite likely related to kúlo 'little'. Thus, nje+wulo means literally 'little mother'. Were this a normal compound in Mende, its form would be nje+gulo. This discrepancy most likely reflects the fact that Mende previously had a more complex system of consonant mutation, more like that of Loko and Bandi than it has now. Apparently the term 'aunt' became fossilized and did not restructure with the rest of the system.

Chapter 5

Loko Tone

5.0 Loko [loko] is the northernmost member of SWM and is spoken in the northeastern part of the Republic of Sierra Leone. It is generally recognized that the Loko people previously had also occupied the territory to the southwest and had been geographically contiguous to the Mende people. Due to a number of wars with the Themme, the Loko people lost some of this area and became geographically isolated from the Mende people, their nearest linguistic neighbors.

Of the two recognized dialects of Loko, Logo [loxo] and, Landogo [landoxo], only the latter has been described in the linguistic literature (Immes 1964a and 1964b). The analysis of Loko tone presented in this chapter is based primarily on the Loko data provided by Mr. Alanany Sesay, a speaker of the Landogo dialect of Loko. The Immes (1964a) article was also consulted, though it did not claim to provide a detailed account of the tonal patterns of this language.

5.1 Rules

The following Loko rules and base forms are presented here as one of the possible descriptively adequate analyses of the tonal behavior of Loko nominals. That is, with these rules, it is possible to derive the surface tonal patterns

of all of the various Loko nominal constructions presented here.

In a few cases, the Loko synchronic information proved to be insufficient for the determination of a unique phonological analysis so that a number of alternative analyses were possible, each differing in degree of abstractness.

In those cases where the synchronic data appears to be insufficient for determination of a unique grammar, the analysis presented below follows the historical development and is, as a result, very abstract. More concrete grammars would necessarily have to make more use of diacritic features (such as [no-weakening] in place of underlying nasals) and rules which require the specification of grammatical environments (such as the Consonant Rules discussed in Mende 4.15). For a further discussion of abstractness see chapter 14.

A diachronic bias in a comparative study such as this has the advantage that, in the comparison of two such diachronically motivated grammars, only true differences between these grammars will emerge. Were less abstract grammars used, potentially false differences might appear. If further evidence warrants a more concrete synchronic grammar, then there may be more differences between these grammars of the SWM languages than I have presented here.

5.11 Lowering

Lowering is identical in form and distribution to its Mende counterpart. Both these Lowering rules lower the

lexical tones of the second and succeeding constituents of nominal compounds, possessed alienable nouns, and familial nouns possessed by his₂.

Lowering

$\dot{v} \rightarrow v / [(\dots +)_1 \dots \dots]$

(where (...+)₁ indicates one or more constituent morphemes)

5.12 High Tone Displacement (HTD)

High Tone Displacement involves two processes which are completely coextensive: First High Tone Copying (the first of the two tone-copying rules in Loko) and High Loss. First High Tone Copying applies only across morpheme boundaries within nominal compounds and possessives. This rule displays the peculiar characteristic of being obligatory for nominal compounds and alienable possession and optional for corporal and familial possession (see 5.4 and 5.5). First High Tone Copying is a contour-producing rule rather than a feature-changing rule. Evidence for this claim is presented in 5.6.

First High Tone Copying (1st HTC)

$$[\alpha_{high}] \rightarrow [+high][\alpha_{high}] / [\dots [+high] + (o) __\dots]$$

Nominal Comp. {oblig.}
 Alien. Poss. {oblig.}
 Corporal Poss. {opt.}
 Familial Poss. {opt.}

First High Tone Copying is formulated so that it applies vacuously to constructions in which the second constituent begins with a high tone (i.e., $\acute{v} \rightarrow \acute{v}\acute{v} = \acute{v}$). The need for the vacuous application of 1st HTC is shown in the derivation of the two paraphrases of 'his knee', given in 5.4.

High Loss applies exclusively to weak-conditioning class 2 nouns, ovovv. This rule operates if and only if the First High Tone Copying rule has applied. This dependency of High Loss on 1st HTC is nicely demonstrated in both corporal and familial possession where the 1st HTC rule is optional (see 5.41 and 5.42).

High Loss

$\acute{v} \rightarrow v / \acute{v}_+ \quad \text{(if 1st HTC has applied and where the resultant } \underline{vv} \text{ is defined in 2.4 as equivalent to } \underline{v})$

5.13 High Tone Extension

This rule may also be a complex of two sub-rules: Low Loss and Second High Tone Copying, the second of the two tone-copying rules in Loko. Low Loss precedes Second High Tone Copying and follows High Loss. While the conjoining of the High Loss and Low Loss rules would be advantageous, it cannot be done because these rules have different ranges of application. Low Loss has the effect of reducing a falling tone to a simple high tone. The mechanism of this rule is discussed in 3.4.

Low Loss

$$v \quad \text{---}\rightarrow \quad \acute{v} / \quad \acute{v} __ (c)v \quad \left(\begin{array}{l} \text{where the resultant} \\ \underline{\acute{v}} \text{ is defined in 2.4} \\ \text{as equivalent to } \underline{\acute{y}} \end{array} \right)$$

Because falling tones are reduced to simple High Tones, Low Loss provides additional input for the following rule, Second High Tone Copying. In fact, the only motivation for this Low Loss rule at present is that both high and falling tones undergo Second High Tone Copying.

Second High Tone Copying, like the First High Tone Copying rule, is contour-producing rather than feature-changing. Arguments are presented in 5.52 to support this claim. Unlike the First High Tone Copying rule, the Second High Tone Copying rule is not restricted to applying across morpheme boundaries, but it is restricted to nominal constructions which do not involve possession.

Second High Tone Copying (2nd HTC)

$$v \quad \text{-----}\rightarrow \quad \acute{v}v / \quad \left[(cv)_0 (c\acute{v})_1 (c) __ \dots \right] \quad \begin{array}{l} \text{Nominals (ex-} \\ \text{cept possessives)} \end{array}$$

5.14 Stress

Because the Loko stress rules are the same as those of Mende, and because they do not affect the tonal patterns of Loko nominals, stress is not marked in this chapter.

5.15 Consonant Rules (C Rules)

Historically, the occurrence of Loko strong initial consonants corresponds to the presence of a preceding nasal

consonant, while weak initial consonants correspond to the absence of such a nasal. The two types of nasals which fortify following consonants in Loko are discussed in 5.21, and the diachronic development of these alternations is discussed in 3.2 and in chapter 14.

The effects of the rules which produce strong and weak initial consonants in Loko are summarized in Figure 5-1. For each series, the base consonants are listed in the left-hand column, the corresponding weak consonants in the middle column, and in the right-hand column the result of the fusion of the historical nasal consonant and the base consonant.

Light Series			Heavy Series			Nasal Series		
Base	Weak	Strong	Base	Weak	Strong	Base	Weak	Strong
p	b	p	b	b	mb	m	ṃ	m
f	v	f						
t	l	t	l	l	nd	n	n	n
k	$\begin{cases} w/_Vbk \\ \emptyset/_Vbk \end{cases}$	k	y	y	nj	ny	ny	ny
			\emptyset	\emptyset	ng	ŋ	ŋ	ŋ
kp	gb	kp				ŋ#	∅#	ng#

In addition, the following initial consonants do not alternate: g, q, h, ɖ, g, gb, l, y, and ŋ.

Figure 5-1: Loko consonant alternation.

5.16 Downdrift

The Loko Downdrift rule is identical to that found in Mende.

Downdrift

$[\alpha\text{high}] \text{ ---} \rightarrow [+lowered] / [-\alpha\text{high}] \text{ ---}$

5.17 Contour Reduction

Loko Contour Reduction is very similar to its Mende counterpart; both versions of this rule reduce short-contour tones to simple high tones by changing the non-high-tone component to high. In Mende, this rule does not apply to sentence-final falling tones; in Loko, I could find no examples of underlying falling tones occurring sentence-finally due to an expanded use of the definite suffixes in Loko. Thus, because sentence-final falling tones do not appear in Loko, as they do in Mende, there appears to be no need to exclude sentence-final falling tones from the Loko Contour Reduction rule (cf. 4.16).

Contour Reduction (Cont Red)

$$v \rightarrow \acute{v} / \left\{ \begin{array}{c} \acute{v} \\ \text{---} \\ \text{---} \end{array} \right\} \quad (\text{where } \acute{v} = \acute{v} \text{ see 2.4})$$

5.2 Base Forms

5.21 Loko morphemes are either strong- or weak-conditioning. When a morpheme with an alternating initial consonant follows a strong-conditioning morpheme, the strong variant of this initial consonant appears on the surface. When a morpheme with an alternating initial consonant follows a weak-conditioning morpheme, the weak variant of the alternating consonant appears on the surface. In this analysis of Loko, strong-conditioning morphemes are marked phonemically with a morpheme-final velar nasal, ...n, and weak-conditioning morphemes are marked phonemically by the absence of such a nasal. While morpheme-final velar nasals do not appear in

the surface representation of Loko, they do appear in the surface representation of Kpelle. Strong initial consonants appear not only when following these strong-conditioning morphemes, but also when following the syllabic nasal prefix n_2 - . This prefix functions as a nominalizing determiner which is added to most noun phrases. When the nasal prefix interacts with the underlying initial consonant, a strong initial consonant results according to the consonant rules summarized in 5.15. The following examples illustrate alternations produced by these values.

Gloss	the crocodile	the short crocodile
Base	n-lámbar-í	n-lámbar+kútú-í
Surface	ndámbar-í	ndámbar+kútú-í
Gloss	the hoe	the short hoe
Base	n-ká.íi-í	n-ká.íi+kútú-í
Surface	ká.í-í	ká.í+wútu-í

5.22 Most of the six tonal classes found in Loko contain both strong-conditioning nouns and weak-conditioning nouns symbolized by (s) or (w) respectively following the class number. In the following listing of these tonal classes, the deletability of medial consonants has not been marked.

Class	Pattern	Example	Gloss
1w	(c'v)c'v	h'e.é	elephant
1s	(c'v)c'v'η	lambá'η	crocodile
2w ¹	(cv)cvv	nikaa'	cow
2s	(cv)c'v'η	mahá'η	chief
3w	(cv)c'vv	pupúu	ant
3s ²	(cv)c'v'vη	ofo'oη	spirit
4w	c'vc'vv	yi.áa	dog
4s	c'vc'v'vη	tébéeη	boundary
5w	cvcv	bεle	trousers
6w	c'vcv	kopa	money

5.23 Both the first and third person singular possessive pronouns have two allomorphs. One allomorph is used with alienable and familial nouns while the other is used with corporal nouns.

	Alienable Familial	Corporal
1st sg	ní	nyaa
3rd sg	ngíí	alaa

The remaining possessive pronouns have one allomorph in all types of possession.³

2nd	sg	bí
1st	pl inc	muú
1st	pl exc	nií
2nd	pl	wú
3rd	pl	tií

The distinction between first person plural inclusive (hearer included) and first person plural exclusive (hearer excluded) is also found in Bandi and Loma.

5.3 Nominal Suffixes

5.31 The Definite

In Loko, when the noun is followed by a definite suffix, only the Downdrift and Contour Reduction tone rules apply. Surprisingly, Loko has two definite suffixes. The suffix -ná is undoubtedly related to the demonstrative -ná 'that' (see 3.5). The other definite suffix has two allomorphs: -í following weak-conditioning nouns, and -ngí following strong conditioning nouns. Diachronically the ng of the ngí suffix developed from the morpheme-final nasal (see 3.2).

Examples of the tonal patterns of each of the tonal classes when followed by the definite suffixes are given below.

Class	base	gloss	definite (<u>-í</u> , <u>-ngí</u>)	definite (<u>-ná</u>)	
1(w)	há.é	elephant	há.é-í	há.é-í	the elephant
1(s)	lámbáŋ	crocodile	ndám-báng-í	ndám-bá-ná	the crocodile
2(w)	nikáá	cow	niká-í	niká-ná	the cow
2(s)	maháŋ	chief	maháng-í	mahá-ná	the chief
3(w)	pupúu	ant	pupú-í	pupú-ná	the ant
3(s)	ofoŋ	spirit	ngofong-í	ngofó-ná	the spirit
4(w)	yí.áa	dog	njí.á-í	njí.á-ná	the dog
4(s)	tebéen	boundary	tebéng-í	tebe-ná	the boundary
5(w)	bélé	trousers	bélé-í	bélé-ná	the trousers
6(w)	kópa	money	kópa-í	kópa-ná	the money

The surface tones of the definite suffixes are either high or downstepped high. This downstepped high tone reflects the operation of the Downdrift rule on the high tone of the definite suffixes, when they are preceded by a non-high tone. As the downstepped high tone is due to a preceding underlying non-high tone, the lack of a downstep is due to

a preceding high tone. Because class 1 and 2 nouns end with a high tone, they do not cause a downstep in a following definite suffix.

	tone pattern	base form	
Class 1	óvóv	hé.é	'elephant'
	óvóv́	lám-bá'ń	'crocodile'
Class 2	ovov́	nikaá	'cow'
	ovov́́	mahá'ń	'chief'

The downstepped high tone of the definite suffixes following class 5 and 6 nouns is preceded by a surface non-high tone and is clearly the result of the Downdrift rule.

Gloss	the purse (5)	the money(6)
Base	mboto-ná	kópa-ná
1. Lowering		
2a. 1st HTC		
2b. High Loss		
3a. Low Loss		
3b. 2nd HTC		
4. C Rules		
5. Downdrift	mboto-ná̌	kópa-ná̌
6. Cont Red		
Surface	mboto-ná̌	kópa-ná̌

The downstepped high tone of the definite suffixes in the remaining examples is not preceded by a surface non-high tone. If the downstep of the suffix is due to a preceding non-high tone and the downdrift rule, then it must be concluded that an underlying non-high tone is deleted following the downdrift rule. This non-high tone is part of a morpheme-final falling tone, as in the following examples:

	tone pattern	base form	
Class 4	óvóvv	yí.áa	'dog'
	óvóvvη	tébéeη	'boundary'
Class 3	ovóvv	pupúu	'ant'
	ovóvvη	ofoónη	'spirit'

The surface downstep of the definite suffix following class 3 and 4 nouns is derived through the application of the Downdrift and Contour Reduction rules:

Gloss	the dog	the ant	the boundary	the spirit
Base	n-yíáa-ná	n-pupúu-ná	n-tébéeη-ná	n-ofoónη-ná
1. Lowering				
2a. 1st HTC				
2b. High Loss				
3a. Low Loss				
3b. 2nd HTC				
4. C Rules	njíáa-ná	pupúu-ná	tébée-ná	ngofóo-ná
5. Downdrift	njíáa-ná	pupúu-ná	tébée-ná	ngofóo-ná
6. Cont Red	njíá-ná	pupú-ná	tébée-ná	ngofó-ná
Surface	njía-ná	pupú-ná	tébée-ná	ngofó-ná

These rules, Downdrift and Contour Reduction, apply to any sequence of a falling tone followed by a high tone. This sequence is also encountered when a noun is followed by a modifying numeral.

base	nyaháa	woman	péré	house
base	lò.ólu	five	lò.ólu	five
Surface	nyahá	lò.ólu five women	péré lò.ólu	five houses

The proposed underlying falling tones of classes 3 and 4 never appear on the surface as falling tones, for they are always reduced to a high tone by the Contour Reduction rule. Were this falling tone only proposed to account for the downstep of a following high tone, it would be both ad hoc

and too abstract in a Kiparskian sense. However, the usefulness of this underlying falling tone goes beyond that of accounting for downstepped definite suffixes, for this proposal also leads to a better understanding of the tonal behavior of those nominal constructions in which high-tone copying takes place (see 5.6).

5.32 The Animate Plural

The animate plural is a complex construction involving three suffixes: the plural₁ suffix, the definite suffix and the plural₂ suffix (see 3.5). The plural₁ morpheme has two segmental allomorphs: -nga following strong-conditioning nouns and -a following weak-conditioning nouns. In forming the animate plural, the plural₁ suffix is followed by the definite suffix -í(w) and the plural₂ suffix -i (s). In addition to the Downdrift and Contour Reduction rules, the Low Loss and Second High Tone Copying rules are necessary to derive the surface tones of this construction.

The variation in tonal patterning of the animate plural is primarily a consequence of the base tones of the noun and the Second High Tone Copying rules. The various surface tonal patterns of animate plurals in Loko appear as follows:

1w	há.é-á-í-i	the elephants
1s	ndámáng-á-í-i	the crocodiles
2w	nika-á-i-i	the cows
2s	maháng-á-í-i	the chiefs
3w	pupú-á-í-i	the ants
3s	ngɔfɔng-a-í-i	the spirits
4w	njí.á-á-í-i	the dogs

The surface tone of plural₁ in this construction is high except following class 3s nouns where it is non-high. The most straightforward analysis of this situation is to regard the base tone of the plural₁ suffix as non-high. If the base tone of the plural₁ suffix were high, then the downstep of the following suffix -1 cannot be easily derived. If the base tone of the plural₁ suffix were falling, then the Downdrift rule would produce a downstep on the following definite suffix, and the contour reduction rule would then reduce the falling tone of the plural₁ suffix to a simple high tone. This falling-tone analysis would work for all classes but class 3s where the suffix has a non-high surface tone. We can avoid this complication by positing a non-high base tone for the plural₁ suffix and by deriving the falling tone as an intermediate stage, except following class 3s nouns. If the plural suffix has an underlying non-high tone, as I claim it does, then the falling tone on this suffix arises from the application of the High Loss rule followed by Second High Tone Copying. The surface high tone of plural₁ results from the Second High Tone Copying and Contour Reduction rules. The surface non-high tone of the plural₁ suffix following class 3s noun stems from the fact that class 3s nouns end in a nasal consonant bearing non-high tone. After the Low Loss rule reduces the falling tone preceding this nasal to a simple high tone, the Second High Tone Copying rule copies this high tone onto the nasal rather than the plural₁ suffix.

Gloss	the elephants	the chiefs
Base	n-hé.é-a-í-i	n-maháŋ-a-í-i
1. Lowering		
2a. 1st HTC		
2b. High Loss		
3a. Low Loss		
3b. 2nd HTC	n-hé.é-aa-í-i	n-maháŋ-aa-í-i
4. C Rules	hé.é-aa-í-i	maháŋ-aa-í-i
5. Downdrift	hé.é-aa-í-i	maháŋ-aa-í-i
6. Cont Red	hé.é-a-í-i	maháŋ-a-í-i
Surface	hé.é-a-í-i	maháŋ-a-í-i
Gloss	the ants	the spirits
Base	n-pupúu-a-í-i	n-ŋfóŋ-a-í-i
1. Lowering		
2a. 1st HTC		
2b. High Loss		
3a. Low Loss	n-pupú-a-í-i	n-ŋfóŋ-a-í-i
3b. 2nd HTC	n-pupú-aa-í-i	n-ŋfóŋ-a-í-i
4. C Rules	pupú-aa-í-i	ngofóŋg-a-í-i
5. Downdrift	pupú-aa-í-i	ngofóŋg-a-í-i
6. Cont Red	pupú-a-í-i	ngofóŋg-a-í-i
Surface	pupú-a-í-i	ngofóŋg-a-í-i

(note that ŋp is reduced the same way as vy)

5.4 Possessives

5.41 Familial Possessives

Loko familial possession involves the same tone rules as Loko corporal possession: Optional High Tone Displacement, Downdrift, and Contour Reduction. Loko possessed familial nouns, like Mende possessed familial nouns, begin with a strong consonant. No derivations of possessed familial nouns are given in this section, for they are tonally identical to those given in the following section, 5.42.

	father without HTD	father with HTD
my	ní-ke.εχί-ná	ní-ké.εχέ-ná
your	bí-ke.εχέ-ná	bí-ké.εχέ-ná
his ₁	ngí-ke.εχέ-ná	ngi-ké.εχέ-ná
his ₂	ke.εχέ	same
our ₁	not used ⁵	ni-ké.εχέ-ná
our ₂	mú-ke.εχέ-ná	mu-ké.εχέ-ná
your	wú-ke.εχέ-ná	wú-ké.εχέ-ná
their	tí-ke.εχέ-ná	ti-ké.εχέ-ná
	brother without HTD	brother with HTD
my	ní-ndéχέ-ná	same
your	bí-ndéχέ-ná	same
his ₁	ngí-ndéχέ-ná	ngi-ndéχέ-ná
his ₂	ndéχέ-ná	same
our ₁	not used	ni-ndéχέ-ná
our ₂	mú-ndéχέ-ná	mu-ndéχέ-ná
your	wú-ndéχέ-ná	same
their	tí-ndéχέ-ná	ti-ndéχέ-ná

5.42 Corporal Possession

The optionality of the High Tone Displacement rule in both corporal and familial possession results in numerous tonal paraphrases. Though the surface form of inalienable Possessives in which the rule has not applied is considered to be as correct as a surface form in which the rule has applied, it is much less frequently used. Below are two parallel sets of corporal possessives. In the first derivation, the High Tone Displacement rule has not applied; in the second set it has.

Set 1 (Without High Tone Displacement)

Gloss	knee	shoulder	tendon
my	nyá-ómbí-ná	nyá-gbákí-ná	nyá-latá-ná
your	bí-ómbí-ná	bí-gbákí-ná	bí-latá-ná
his	alá-ómbí-ná	alá-gbákí-ná	alá-latá-ná
our ₁	ní-ómbí-ná	ní-gbákí-ná	ní-latá-ná
our ₂	mú-ómbí-ná	mú-gbákí-ná	mú-latá-ná
your	wú-ómbí-ná	wú-gbákí-ná	wú-latá-ná
their	tí-ómbí-ná	tí-gbákí-ná	tí-latá-ná

Set 2 (With High Tone Displacement)

Gloss	knee	shoulder	tendon
my	nyá-ómbí-ná	nyá-gbákí-ná	nyá-latá-ná
your	bí-ómbí-ná	bí-gbákí-ná	bí-latá-ná
his	alá-ómbí-ná	alá-gbákí-ná	alá-latá-ná
our ₁	ní-ómbí-ná	ní-gbákí-ná	ní-latá-ná
our ₂	mu-ómbí-ná	mu-gbákí-ná	mu-latá-ná
your	wú-ómbí-ná	wú-gbákí-ná	wú-latá-ná
their	ti-ómbí-ná	ti-gbákí-ná	ti-latá-ná

In both sets of examples, a high tone following either the first person singular pronoun, nyáa, or the third person singular pronoun, aláa, is downstepped:⁶

nyá-ómbí-ná my knee alá-ómbí-ná his knee

This downstep is a consequence of the falling base tone of these pronouns and the Downdrift and Contour Reduction rules. Because the final non-high-toned component of the falling tone of these pronouns also blocks the application of the (optional in this case) First High Tone Copying rule, Possessives involving these pronouns have only one surface tonal pattern:

Gloss	my knee	his knee
Base	nyáa-ómbí-ná	aláa-ómbí-ná
1. Lowering		
2a. 1st HTC		
2b. High Loss		
3a. Low Loss		
3b. 2nd HTC		
4. C Rules		
5. Downdrift	nyáa-ómbí-ná	aláa-ómbí-ná
6. Cont Red	myá-ómbí-ná	alá-ómbí-ná
Surface	nyá-ómbí-ná	alá-ómbí-ná

The surface tones of the pronouns bí and wú are high in both tonal paraphrases of corporal possessives. These pronouns do not cause a following high tone to be downstepped, and they do not undergo High Tone Reduction. For these reasons, bí and wú have been given an underlying high tone.

Gloss	your shoulder	
Base	bí-kpakíi-ná	
1. Lowering		
2. High Copy		----> bí-kpáakíi-ná
3. High Ext		
4. C Rules	bí-gbakíi-ná	bí-gbáakíi-ná
5. Downdrift	bí-gbakíi-ná	bí-gbáakíi-ná
6. Cont Red	bí-gbakíi-ná	bí-gbakíi-ná
Surface	bí-gbakíi-ná	bí-gbakíi-ná

All of the remaining pronouns have a high surface tone when there is no High Tone Displacement, and a non-high surface tone when there is. The base tones of these pronouns are rising.

The alternation is due to the optional application of the High Tone Displacement rule, which includes both the First

High Tone Copying Rule and the High Loss rule. Below is a sample derivation:

Gloss	our tendon	
Base	nií-lataá-ná	
1. Lowering		
2a. 1st HTC	--→	nií-láataá-ná
2b. High Loss		ni-láataá-ná
3a. Low Loss		
3b. 2nd HTC		
4. C Rules		
5. Downdrift	nií-lataá-ná	ni-láataá-ná
6. Cont Red	ní-lata-ná	ni-lata-ná
Surface	ní-lata-ná	ni-láta-ná

The derivation of the tonal paraphrases of 'their knee' requires the optional, albeit vacuous, application of 1st HTC.

Gloss	their knee	
Base	tií-ómbí-ná	
1. Lowering		
2a. 1st HTC	--→	tií-óómbí-ná (óó = ó)
2b. High Loss		ti-ómbí-ná
3a.		
3b.		
4 C Rules		
5. Downdrift	tií-ómbí-ná	ti-ómbí-ná
6. Cont Red	tí-ómbí-ná	ti-ómbí-ná
Surface	tí-ómbí-ná	ti-ómbí-ná

In this analysis, the High Loss rule has been formulated so that it will apply if and only if First High Tone Copying applies. This formulation is based on the observation that there are no cases of First High Tone Copying having applied without the following application of High Loss. If 1st HTC

could apply without High Loss, the non-occurring *tí-látá-ná instead of tí-látá-ná 'their tendon', would be derived.

Secondly, tí-ombí-ná 'their knee' could be derived with the application of High Loss and without the application of 1st HTC. This would result in the situation where High Loss applies obligatorily if 1st HTC does, and optionally if 1st HTC doesn't apply. This statement could be simplified if the 1st HTC rule is written so that it vacuously copies a high tone onto a high tone ($\acute{v} \rightarrow \acute{v}\acute{v} = \acute{v}$). With 1st HTC written in this way, High Loss can then be formulated so that it applies if and only if 1st HTC applies. And if 1st HTC and High Loss are regarded in this way, they appear to be sub-processes of the same rule, High Tone Displacement.

High Tone Displacement is also optional in constructions involving familiarly possessed nouns. Familiar possession differs from corporal possession in two ways: First, the possessed noun begins with a strong consonant. Secondly, the first person singular pronoun is ní (with a high base tone) and the third person singular is ngíí (with a rising base tone). Some examples of familiar possession are given in 5.41.

5.43 Alienable Possession

In alienable possession, both Lowering and High Tone Displacement apply obligatorily. The Lowering rule is necessary to derive the non-high tones of the second and subsequent syllables of possessed alienable nouns. High Tone Displacement is necessary to derive the initial high tone of possessed alienable nouns.

Gloss	Medicine	chief
Base	hálé	maháŋ
my	ní+hále-ná	ní+wáha-ná
your	bí+hále-ná	bí+wáha-ná
his	ngi+hále-ná	ngi+wáha-ná
our ₁	ni+hále-ná	ni+wáha-ná
our ₂	mu+hále-ná	mu+wáha-ná
your	wú+hále-ná	wú+wáha-ná
their	ti+hále-ná	ti+wáha-ná

Gloss	cow	school
Base	nikaa	súkulu
my	ní+nika-ná	ní+súkulu-ná
your	bí+nika-ná	bí+súkulu-ná
his	ngi+nika-ná	ngi+súkulu-ná
our ₁	ni+nika-ná	ni+súkulu-ná
our ₂	mu+nika-ná	mu+súkulu-ná
your	wú+nika-ná	wú+súkulu-ná
their	ti+nika-ná	ti+súkulu-ná

The pronouns ní, 'my', bí 'your sg', and wú 'your pl', have high base tones. The surface tones of alienable possessives involving these pronouns are derived as follows:

Gloss	my medicine	your sg. medicine	your pl. medicine
Base	ní+hále-ná	bí+hále-ná	wú+hále-ná
1. Lowering	ní+hále-ná	bí+hále-ná	wú+hále-ná
2a. 1st HTC	ní+háale-ná	bí+háale-ná	wú+háale-ná
2b. High Loss			
3a. Low Loss	ní+hále-ná	bí+hále-ná	wú+hále-ná
3b. 2nd HTC			
4. C Rules			
5. Downdrift	ní+hále-ná	bí+hále-ná	wú+hále-ná
6. Cont Red			
Surface	ní+hále-ná	bí+hále-ná	wú+hále-ná

The remaining possessive pronouns: ngii, 'his', nií 'our₁', muú 'our₂', and tií 'their' have a short rising underlying tone. The surface tones of alienable possessives involving these pronouns are derived as follows:

Gloss	his medicine	our ₁ medicine	their medicine
Base	ngii+hále-ná	muú+hále-ná	tií+hále-ná
1. Lowering	ngii+hale-ná	muú+hale-ná	tií+hale-ná
2a. 1st HTC	ngii+háale-ná	muú+háale-ná	tií+háale-ná
2b. High Loss	ngi+hále-ná	mu+háale-ná	ti+háale-ná
3a. Low Loss	ngi+hále-ná	mu+hále-ná	ti+hále-ná
3b. 2nd HTC			
4. C Rules			
5. Downdrift	ngi+hále-ná	mu+hále-ná	ti+hále-ná
6. Cont Red			
Surface	ngi+hále-ná	mu+hále-ná	ti+hále-ná

5.5 Nominal Compounds

5.51 In Loko nominal compounds, the Lowering rule is followed by both high-tone copying rules. In some situations, the high-tone copying rules obscure, but do not completely obliterate, the effects of the Lowering rule. Because of the Lowering rule, the tone of the second constituent of these nominal compounds is completely determined by the final tones of the first constituent and completely independent of the lexical tones of the second constituent.

The Lowering rule produces the basic tonal pattern of the second constituent of nominal compounds. This pattern is a sequence of non-high tones. The basic tonal pattern may then be modified by the effects of one or both tone-copying rules. Thus in nominal compounds, the second constituent can display one of three tonal patterns. When the

constituent of a nominal compound is a class 3s, 4s, 5 noun the tones of the second constituent of the compound are all non-high.

Class 3s	ngɔ́fɔ́+kutu-nǎ	the short spirit (kútú 'short')
4s	tébé+kutu-nǎ	the short boundary
5w	bɛlɛ+wutu-nǎ	the short trousers

These examples are derived with the application of the Lowering rule without the subsequent application of the high-tone copying rules. With class 5 nouns, it is obvious that no high-tone copying rule could apply, because there is no high tone to copy. Because class 3s and 4s nouns end in a non-high-toned nasal, the First High Tone Copying rule cannot apply. After Low Loss reduces the falling tone of class 3s and 4s nouns to a simple high tone, then the Second High Tone Copying rule copies this high tone onto the nasal rather than onto the first syllable of the following morpheme.

Gloss	short spirit	short boundary
Base	n-ɔ́fɔ́ɔ́ɔ́+kútú-nǎ	n-tébéenɛ+kútú-nǎ
1. Lowering	n-ɔ́fɔ́ɔ́ɔ́+kutu-nǎ	n-tébéenɛ+kutu-nǎ
2a. 1st HTC		
2b. High Loss		
3a. Low Loss	n-ɔ́fɔ́ɔ́ɔ́+kutu-nǎ,	n-tébéɛɛɛ+kutu-nǎ,
3b. 2nd HTC	n-ɔ́fɔ́ɔ́ɔ́+kutu-nǎ	n-tebenɛɛ+kutu-nǎ
4. C Rules	ngɔ́fɔ́+kutu-nǎ	tébé+kutu-nǎ
5. Downdrift	ngɔ́fɔ́+kutu-nǎ	tébé+kutu-nǎ
6. Cont Red		
Surface	ngɔ́fɔ́+kutu-nǎ	tébé+kutu-nǎ

Gloss	short trousers
Base	bele+kútú-ná
1. Lowering	bele+kutu-ná
2a. 1st HTC	
2b. High Loss	
3a. Low Loss	
3b. 2nd HTC	
4. C Rules	bele+wutu-ná
5. Downdrift	bele+wutu-ná
6. Cont Red	
Surface	bele+wutu-ná

Following weak-conditioning nouns ending in a falling tone (classes 3 and 4), the tonal pattern of the second constituent is high followed by non-highs.

Class 4w	njí.á+wútu-ná	the short dog
Class 3w	nyahá+wútu-ná	the short woman

Because these end in a falling tone, First High Tone Copying does not apply, but unlike strong-conditioning class 3 and 4 nouns, these falling tones do undergo Low Loss and are reduced to simple high tones. Following Low Loss, Second High Tone Copying applies.

Gloss	short dog	short woman
Base	n-yí.áa+kútú-ná	n-nyaháa+kútú-ná
1. Lowering	n-yí.áa+kutu-ná	n-nyaháa+kutu-ná
2a. 1st HTC		
2b. High Loss		
3a. Low Loss	n-yí.á+kutu-ná	n-nyahá+kutu-ná
3b. 2nd HTC	n-yí.á+kúutu-ná	n-nyahá+kúutu-ná
4. C Rules	njí.á+wúutu-ná	nyahá+wúutu-ná
5. Downdrift	njí.á+wúutu-ná	nyahá+wúutu-ná
6. Cont Red	njí.á+wútu-ná	nyahá+wútu-ná
Surface	njí.á+wútu-ná	nyahá+wútu-ná

7

The third tonal pattern of the second constituent of nominal compounds is high high (non-high)_o. This tone pattern follows both the weak and strong members of classes 1 and 2.

1w	péré+wútú-ná	the short house
1s	ndámhá+kútú-ná	the short crocodile
2w	niká+wútú-ná	the short cow
2s	maha+kútú-ná	the short chief

That a high tone is not extended beyond the first two syllables of the second constituent of a nominal compound can be clearly seen in those compounds where the second constituent is trisyllabic, such as in the following involving súkulu 'school'.

3s	ngofó+súkulu-ná	the spirit school
3w	nyahá+súkulu-ná	the woman's school
2s	maha+súkulu-ná	the chief's school

Compounds in which the tonal pattern of the second constituent is high high (non-high)_o involve the application of both tone-copying rules. The First High Tone Copying rule advances a final high tone of the first constituent onto the first syllable of the second constituent by converting the first tone of the second constituent into a falling-tone. This falling tone is reduced by Low Loss to a simple high tone, which then undergoes Second High Tone Copying. This rule extends the high tone onto the second syllable of the second constituent.

Gloss	short house	short chief
Base	n-pé [́] ré+kú [́] tú-ná	n-mahá [́] ñ+kú [́] tú-ná
1. Lowering	n-pé [́] ré+kutu-ná	n-mahá [́] ñ+kutu-ná
2a. 1st HTC	n-pé [́] ré+kúutu-ná	n-mahá [́] ñ+kúutu-ná
2b. High Loss		
3a. Low Loss	n-pé [́] ré+kútu-ná	n-mahá [́] ñ+kútu-ná
3b. 2nd HTC	n-pé [́] ré+kútúu-ná	n-mahá [́] ñ+kútúu-ná
4. C Rules	pé [́] ré+wútúu-ná	mahá [́] +kútúu-ná
5. Downdrift	pé [́] ré+wútúu-ná	mahá [́] +kútúu-ná
6. Cont Red	pé [́] ré+wútú-ná	mahá [́] +kútú-ná
Surface	pé [́] ré+wútú-ná	mahá [́] +kútú-ná

Class 2w nouns, nikaá, undergo the High Loss rule following First High Tone Copying. This rule eliminates the underlying high tone which served as the source high tone for the tone-copying rules.

Gloss	short cow
Base	n-nikaá+kú [́] tú-ná
1. Lowering	n-nikaá+kutu-ná
2a. 1st HTC	n-nikaá+kúutu-ná
2b. High Loss	n-nika+kúutu-ná
3a. Low Loss	n-nika+kútu-ná
3b. 2nd HTC	n-nika+kútúu-ná
4. C Rules	nika+wútúu-ná
5. Downdrift	nika+wútúu-ná
6. Cont Red	nika+wútú-ná
Surface	nika+wútú-ná

5.52 When a monosyllabic morpheme is used as the second constituent of a nominal compound, the tone of the following definite article is still downstepped, despite the application in some cases of two high tone advancement rules. The following examples have the monosyllabic mbaa 'rice' as the second constituent.

bush	2w	nd _ŋ gb _ŋ -ná	bush rice	nd _ŋ gb _ŋ +bá-ná
house	1w	pé _é -ná	house rice	pé _é +bá-ná
mortar	2w	kondá-ná	mortar rice	kondá+bá-ná
purse	5w	mb _ŋ t _ŋ -ná	bag rice	mb _ŋ t _ŋ +bá-ná

In the first two examples above, both tone-copying rules have applied to a monosyllabic second constituent, yet the high tone is advanced only one syllable. This is because the falling tone which was derived by the First High Tone Copying rule is not reduced by Low Loss. Low Loss does not apply because the falling tone is not followed by a non-high tone.⁷

Gloss	house rice	mortar rice
Base	n-pé _é +báá-ná	n-kondáa+báá-ná
1. Lowering	n-pé _é +bá-ná	n-kondáa+bá-ná
2a. 1st HTC	n-pé _é +báa-ná	
2b. High Loss		
3a. Low Loss		n-kondá+bá-ná
3b. 2nd HTC		n-kondá+báa-ná
4. C Rules	pé _é +báa-ná	kondá+báa-ná
5. Downdrift	pé _é +báa-ná	kondá+báa-ná
6. Cont Red	pé _é +bá-ná	kondá+bá-ná
Surface	pé _é +bá-ná	kondá+bá-ná

Gloss	bag rice
Base	n-b _ŋ t _ŋ +báá-ná
1. Lowering	n-b _ŋ t _ŋ +bá-ná
2a. 1st HTC	
2b. High Loss	
3a. Low Loss	
3b. 2nd HTC	
4. C Rules	mb _ŋ t _ŋ +bá-ná
5. Downdrift	mb _ŋ t _ŋ +bá-ná
6. Cont Red	
Surface	mb _ŋ t _ŋ +bá-ná

5.6 Why Loko High-Tone Copying Rules are Contour-Producing

5.61 The two high-tone copying rules of Loko have been proposed as contour-producing rules rather than feature-changing rules. That is, the Loko tone-copying rules convert a non-high tone to a falling tone rather than a simple high tone. In this section, it is demonstrated that the falling tones produced by the tone-copying rules are identical to what I have proposed as underlying short-falling tones, and that by this formulation, the tonal behavior of multiple compounds can be derived with a cyclical application of existing rules.

The term multiple compound designates nominal constructions in which one nominal compound is further embedded into another compound.

péré+hále+óha-ná	the old[hospital]
mahá+mbíli+ngoha-ná	the old[royal drum]
nyahá+béré+oha-ná	the old[woman's house]

As these examples illustrate, the tonal pattern of the third constituent of multiple compounds can be either a high non-high or a non-high non-high tonal pattern. These tonal patterns can be derived with the existing rules if all rules except Downdrift and Contour Reduction are applied cyclically. Contour Reduction is not part of this cyclical rule application, for if it were used as such, it would prematurely reduce a number of falling tones crucial to the correct derivation of surface tones. Because nothing is gained by including the Downdrift rule in the rule cycle it

is considered, like Contour Reduction, to apply after these other rules.

Gloss	old hospital	old woman's house
Base	n-[[pé [́] ré+há [́] lé]+óhá]-ná	n-[[nyaháa+pé [́] ré]+óhá]-ná
First Cycle (applies to innermost constituents)		
1. Lowering	pé [́] ré+há [́] le	nyaháa+pé [́] ré
2a. 1st HTC	pé [́] ré+há [́] aale	
2b. High Loss		
3a. Low Loss	pé [́] ré+há [́] le	nyahá+pé [́] ré
3b. 2nd HTC	pé [́] ré+há [́] lee	nyahá+pé [́] ré
Second Cycle (applies to all three constituents)		
1. Lowering	pé [́] ré+há [́] lee+oha	nyahá+pé [́] ré+oha
2a. 1st HTC		
2b. High Loss		
3a. Low Loss	pé [́] ré+há [́] le+oha	nyahá+pé [́] ré+oha
3b. 2nd HTC	pé [́] ré+há [́] le+óoha	nyahá+pé [́] ré+oha
Final Rules	n-pé [́] ré+há [́] le+óoha-ná	n-nyahá+pé [́] ré+oha-ná
4. C Rules	pé [́] ré+há [́] le+óoha-ná	nyahá+pé [́] ré+oha-ná
5. Downdrift	pé [́] ré+há [́] le+óoha-ná	nyahá+pé [́] ré+oha-ná
6. Cont Red	pé [́] ré+há [́] le+oha-ná	nyahá+pé [́] ré+oha-ná

These rules also produce the desired results when the second constituent is a monosyllable as the following derivation of pé[́]ré+bá+óoha-ná 'old rice house' illustrates:

Gloss	old rice house
Base	n-[[pé [́] ré+baá]+óhá]-ná
First Cycle	
1. Lowering	pé [́] ré+ba
2a. 1st HTC	pé [́] ré+baá
2b. High Loss	
3a. Low Loss	
3b. 2nd HTC	

Second Cycle	péré+báa+óhá
1. Lowering	péré+báa+oha
2a. 1st HTC	
2b. High Loss	
3a. Low Loss	péré+bá+oha
3b. 2nd HTC	péré+bá+óoha
Final Rules	n-péré+bá+óoha-ná
4. C. Rules	péré+bá+óoha-ná
5. Downdrift	péré+bá+óoha-ná
6. Cont Red	péré+bá+óoha-ná
Surface	péré+bá+óoha-ná

It does not seem possible that this surface form could be derived in any convincing way in a formulation which treats these tone-copying rules as simple assimilation processes which convert non-high tones to high, rather than to falling tones. The derivation of multiple compounds in Loko demonstrates that a derived falling tone and an underlying falling tone are equivalent with respect to the application of Loko tone rules.. Neither underlying nor derived falling tones undergo First High Tone Copying. Both morpheme-final underlying and derived falling tones of weak but not strong-conditioning nouns undergo Second High Tone Copying.

The morphemes bílín 'drum' and kún 'odor', both strong-conditioning nouns, further illustrate the similarity between underlying and derived falling tones. When these nouns are used as the second constituent of a nominal compound, they have, according to the above rules, a derived falling tone:

maháŋ+bíliŋ	<u>-1st Cycle</u> →	maháŋ+bíliiŋ	royal drum
pélé+kúŋ		pélé+kúuŋ	house odor

When these compounds are further embedded into nominal compounds, high-tone copying is not observed. High tone copying is also not observed in compounds in which the first constituent is a strong-conditioning noun which ends in an underlying falling tone.

mahá+mbíli+ngoha-ná	the old royal drum
pélé+wú+ngoha-ná	the old house odor
tébé+ngoha-ná	the old boundary
ngɔ́ŋ+ngoha-ná	the old spirit

Derived falling tones, then, are identical to underlying falling tones in every situation where they produce a distinctive tonal pattern. For example, the definite suffix is downstepped following both underlying and derived falling tones.

	underlying	derived (after first cycle)
base	n-nyaháa-ná	n-péré+óháa-ná
surface	nyahá-ná	péré+óhá-ná
gloss	the woman	the old house

Second, but not First, High Tone Copying applies to falling tones of weak-conditioning morphemes (see 5.5).

	underlying	derived (after first cycle)
base	n-nyaháa+kútú-ná	n-péré+óháa+kútú-ná
surface	nyahá+wútu-ná	péré+óhá+wútu-ná
gloss	the short woman	the short old house

Finally, neither First nor Second High Tone Copying advances a high tone onto a following morpheme when the falling tone is followed by a non-high-toned morpheme-final nasal.

	underlying	derived (after first cycle)
base	n-ɔfɔ́ɔŋ+kútú-ná	n-maháŋ+bílíŋ+kútú-ná
surface	ngɔfɔ́ɔ+kutu-ná	mahá+mbílí+kutu-ná
gloss	the short spirit	the short royal drum

This historically motivated analysis, while abstract, has produced some important findings. First, it has been shown that the falling tone produced by the tone-copying rules is in every way identical to the falling tone of underlying representations. Secondly, it has been demonstrated that with underlying morpheme-final nasals, it is possible to provide a natural explanation as to how strong-conditioning nouns cause the fortition of a following consonant and why strong-conditioning nouns under certain conditions have the effect of blocking Second High Tone Copying. It is worth pointing out here that less abstract analyses which do not posit a morpheme-final nasal are still going to have to provide accounts of these phenomena.

Footnotes

Chapter 5

1. Innes (1964) reports two types of what I have called class 2w nouns: one ending in a high tone and the other in a non-high tone in isolation.

kɔ́rá	cloth	kɔ́ra hánda	cloth business
ngeha	rope	ngeha hánda	rope business

I found ngeha to pattern in the same way as the other class 2w nouns, although I could not obtain these nouns in isolation without the definite suffix.

2. Sub-classes, 3s and 4s could also be transcribed as cvcvɲ and cvcvɲ respectively, where the morpheme-final velar nasal is a non-high tone. The transcriptions used in this chapter (cvcvɲ and cvcvɲ) were chosen because they emphasize the fact that these morphemes end in a non-high tone. Either set of base forms will produce the surface tonal patterns with the given Loko tone rules.

3. The different surface tonal patterns of the corporal possessives argue for distinct tonal representation of these two types of pronouns.

bí-latá-ná	or	bí-látá-ná	your tendon
tí-latá-ná		ti-látá-ná	their tendon

Were what I have called rising base tones (e.g., tíí) simple high tones which underwent tonal displacement, then the base tone of 'your singular' would have to be marked with a diacritic feature such as [No Tone Displacement] or be marked with a long vowel.

4. The effects of Lowering on the his₂ paraphrase are identical to those found in Mende (see 2.41).
5. The lack of this form may be due to his homophony with the first person singular.
6. Innes interprets this downstepped high tone, like most downstepped high tones in Loko as a mid tone.
7. It could also be said that when Second High Tone Copying applies to a falling tone, vvv results. This tone in SWM would have to be defined as non-distinct from vv.

Chapter 6

Bandi Tone

6.0 Bandi is spoken in the northeastern part of the Republic of Liberia in an area adjacent to the Mende of the Republic of Sierra Leone and the Loma of the Republic of Guinea and Liberia. Little dialect variation in Bandi has been reported. The Bandi people call themselves [bandi], though most non-Bandi people call them [gbandi]. This discrepancy reflects a sound change (gb > b) which took place in Bandi following the acquisition by outsiders of the term [gbandi] as the name of these people.

Heydorn is responsible for the only grammars on Bandi. He produced a manuscript written in English (ca. 1935). This he later revised, adding a good deal of comparative information, and, in 1941, published in German, his native language, as "Die Bande Sprache." There are also a few , stenciled copies of a revised version of the 1935 manuscript. Though this revised version contains neither a mention of the date of revision nor mention of the revisors, it appears to have been the work of Purves, Ndebe, and Bombo (1966), the authors of the 1966 stenciled revision of the Bandi-English, English-Bandi Dictionary, a work based on a vocabulary compiled by Parsell.

There is also a ten page stenciled "Notes on Bandi" by Welmers (no date) designed for non-linguists who want to learn Bandi. Copies of all of the above unpublished documents can be found in the Cuttington College Library, Cuttington, Liberia.

The Bandi data used in this analysis of Bandi tone was supplied principally by Mr. Agustin Kamara and Mr. Wilfred Kamra with additional information being supplied by Mr. Harry Moniba and Dr. Lamin Kotu, all speakers of the Bandi language.

Like the preceding presentation of Loko tone, this analysis of Bandi tone is historically, rather than synchronically, motivated. That is, while the following base forms and rules produce the observed surface tones of Bandi nominal constructions, these rules and base forms have not always been justified on synchronic grounds. For example, I could not find enough evidence to fully support the representation of the final tone of Bandi class 2 nouns (6.2) as an underlying rising tone. While these rising tones must be distinct from simple high tones and while this underlying representation makes it possible to easily derive the observed surface variants of this tone, it has not been demonstrated that this representation is synchronically superior to a less abstract one which makes use of a diacritic feature. Sufficient evidence is also unavailable to support the contour-producing nature of Bandi tone-copying rules, although such a formulation accounts for the downstep of the definite suffix under certain conditions (6.5). The reasons for

selecting an abstract, historically biased grammar in the absence of synchronically well motivated base forms are discussed in 5.1 The question of the abstractness of SWM phonology is also discussed in chapter 14.

6.1 Rules

The final form and ordering of the rules used to describe the tonal behavior of Bandi nominals is given below:

6.11 Lowering

This rule is identical to that found in Loko and Mende except for the absence in Bandi of a his₂ paraphrase (see 4.41 and 5.41).

Lowering

$\downarrow \text{ ----} \rightarrow \quad \vee / \left[(\dots +)_1 \dots \text{---} \dots \right]$

Nominal Com-
pounds.
Alienable Poss.

(where $(\dots +)$, indicates one
or more constituent morphemes)

6.12 High Tone Displacement (HTD)

As in Loko, this rule has two parts: First High Tone Copying and High Loss. Each of these rules is identical to its Loko counterpart except that First High Tone Copying in Bandi does apply to all possessives but does not apply to nominal compounds in which the first constituent is a class 6 or class 7 noun (see 6.2).

First High Tone Copying (1st HTC)

$[+high] \text{ --} \rightarrow [+high][+high] / \left[\dots [+high] + (o) \text{---} \dots \right]$

Nominal Compounds (ex-
cept those with a class
6 or 7 first constituent)
All Possessives

High Loss

$\acute{v} \rightarrow v / v_+$ (if 1st HTC has applied and where the resultant vv is defined (2.4) as equivalent to v)

6.13 High Tone Extension (HTE)

This rule, like its Loko counterpart, also has two components: Low Loss and Second High Tone Copying.

Low Loss

$v \rightarrow \acute{v} / \acute{v}__ (o)v$ (where $\acute{v}\acute{v} = \acute{v}$)

Second High Tone Copying (2nd HTC)

$v \rightarrow \acute{v}\acute{v} / [(\acute{o}v)_0(\acute{o}\acute{v})_1(o)__ \dots]$
 Nominals (except those with a class 6 or 7 first constituent and inalienable possessives)

6.14 Weak Suffix Contouring

Because this rule is very restricted, applying only to the weak high-toned suffixes (such as -í preceded by a morpheme ending in a vowel) and only when occurring sentence-finally, this rule is unordered with respect to the others and could be placed anywhere in the ordered list of rules. Weak Suffix Contouring converts the high tone of a sentence-final weak suffix into a falling tone.

Weak Suffix Contouring (WSC)

$-\acute{v} \rightarrow -\acute{v}\acute{v} / \dots v__ \#S$

6.15 Stress

The Bandi Stress rule is the same as that of Mende and Loko (see 4.17), where the initial high tone of a nominal is generally stressed. In this chapter, stressed syllables are underlined.

6.16 Low Tone Advancement

This is the major rule which distinguishes Bandi from Loko tonally. Because this rule applies following Stress, there are many stressed syllables in Bandi with non-high tones (see 6.3). Low Tone Advancement (LTA) has four important restrictions:

- a) LTA applies only if the nominal begins with a non-high tone (see 6.4).
- b) LTA lowers only a high tone which is followed by another high tone.
- c) LTA does not apply to alienable possessives.
- d) LTA does not apply to class 6 and 7 nouns.

Low Tone Advancement (LTA)

✓ ---→ v/ [(ov)₁(o)___(o)́v...] Nominals (except
alienable and
familial poss)

6.17 Consonant Rules (C Rules)

The strong-weak initial consonant alternation found in Bandi is essentially the same as that of Loko. The effects of the Consonant Rules which produce these alternations are summarized below in Figure 6+1. For each series, the underlying consonants are given in the first column, the

corresponding weak consonants in the second column, and the corresponding strong consonants in the third column.

Light Series			Heavy Series			Nasal Series		
Base	Weak	Strong	Base	Weak	Strong	Base	Weak	Strong
p	v	p	p	$\begin{cases} y/_V-bk \\ w/_Vbk \end{cases}$	mb	m	$\begin{cases} \tilde{y}/_V-bk \\ \tilde{w}/_Vbk \end{cases}$	m
f	h	f						
t	l	t	l	l	nd	n	n	n
s	h	s	y	y	nj	ny	\tilde{y}	ny
k	$\begin{cases} w/_V-rd \\ y/_V-rd \end{cases}$	k	ǵ	y	ng	ŋ	ŋ	ŋ
kp	b	kp						

In addition, the following consonants do not alternate: b, d, g, gb, l, y and w.

Figure 6.1: Bandi consonant alternation.

6.18 Downdrift

This rule is the same as the Downdrift rules found in Loko and Mende.

Downdrift

$[\alpha\text{high}] \rightarrow [+lowered] / [-\alpha\text{high}] \underline{\hspace{1cm}}$

6.19 Contour Reduction

Bandi Contour Reduction is the same as the Mende version. Because of the Bandi Weak Suffix Contouring rule which produces sentence-final short falling tones, the simpler Loko Contour Reduction rule cannot be used.

Contour Reduction (Cont Red)

$v \rightarrow \acute{v} / \left\{ \begin{array}{c} \acute{v} \\ \acute{v} _ \dots \end{array} \right\}$ (where $\acute{v}\acute{v} = \acute{v}$ see 2.4)

6.2 Base Forms

6.21 Like their Loko counterparts, Bandi nouns are either strong-conditioning or weak-conditioning. In the representation of Bandi nouns, like Loko, strong-conditioning morphemes end in a nasal consonant (masán 'chief'), and weak-conditioning nouns end in an oral vowel (pélé 'house'). The marking of Bandi strong-conditioning nouns in this way follows Heydorn (1941) who marked what I have called strong-conditioning nouns with a raised morpheme-final nasal (e.g., masáⁿ 'chief'). Again, the synchronic status of these nasals has not been fully justified here; alternative solutions would have to treat this phenomenon with a less abstract but more arbitrary diacritic feature. This nasal interacts with a following consonant to produce a strong consonant (see 6.17). In addition to this morpheme-final nasal, Bandi has three nasal prefixes which also cause the strengthening of a following consonant. The possessive pronouns n̄-, 'my' and n₁- 'his' are discussed in 6.23. The noun phrase prefix n₂- has the same meaning and distribution as its Loko counterpart (see 5.21).

6.22 The tonal types of Bandi nouns differ from their Loko counterparts as the result of one Bandi innovation: the restructuring of underlying short falling tones to high. This has resulted in the merging of tone classes 1 and 4 (see 11.2).

		Pattern	Example	Gloss
Class	1w	c'vc'v	péle	house
	1s	c'vc'v́	lámbá́	crocodile
Class	2w	cvcv'v	peleé	road
	2s	ovc'v́	masá́	chief
Class	3w	cvc'v	kondá	mortar
	3s	cvc'v́	ḡalí́	thorn
Class	4w	c'vc'v	káli	hoe
	4s	c'vc'v́	no examples	
Class	5w	cvcv	bolo	hat
	5s	cvcv́	belen	trousers
Class	6s	cvc'v́	kóhí́	coffee
Class	7w	c'vcv	dála	dollar

Almost all of the members of class 6 and 7 nouns are recent borrowings from English, quite possibly via Krio, an English-based creole language spoken in Sierra Leone. These morphemes are exceptions to all of the Bandi tone-spreading rules and are marked with the diacritic feature [+foreign] to show this exceptionality.

6.23 The base forms of the Bandi possessive pronouns are also very similar to their Loko counterparts. The following Bandi possessive pronouns have the same segmental and tonal representations in all types of possessives. Furthermore, Bandi pronouns differ from their Loko cognates only in the second person singular pronoun: Lk: pí and Ba: í. The development of the different second person singular pronouns is discussed in 9.1.

		Bandi	Loko
2nd	sg	í-	bí-
1st	pl ex	muú	muú-
1st	pl in	nií	nií
2nd	pl	wú	wú
3rd	pl	tií	tií

The most striking differences occur in the first and third person singular corporal possessive pronouns. In both Bandi and Loko, the first and third person singular pronouns have two allomorphs: one used in the possession of corporal nouns, and one used in the possession of familial and alienable nouns:

Alienable and Familial Possessive Pronouns

		Bandi	Loko
1st	sg	ní	ní
3rd	sg	ngíí	ngíí

Corporal Possessive Pronouns

		Bandi	Loko
1st	sg	ń-	nyáa
3rd	sg	n ₁ -	aláa

The base forms of the Bandi first and third person singular corporal possessive pronouns are tone-bearing nasals. These tones, as a result of the tone-spreading rules, influence the tones of the following morpheme. Subsequently, these nasal pronouns and their tones are often lost due to the effects of the Consonants Rules which combine a nasal with a following consonant to produce a strong consonant.

6.3 Nominal Suffixes

The operation of Weak Suffix Contouring, Stress, Low Tone Advancement, the Consonant Rules and Downdrift demonstrated in the definite and citation form of the Bandi noun.

The diachronic development of the Bandi ngí variant of the definite suffix -í, as in Loko, has been attributed to the expansion of the morpheme-final nasal n to ng (see 3.2).

masáŋ-í C Rules → masáng-í

Low Tone Advancement applies following the assignment of stress and results in the definite form of class 1-4 nouns having a stressed non-high tone.

Class	1w	<u>pé</u> lě-íi	the house
	1s	<u>ndambá</u> ŋ-í	the crocodile
	2w	<u>nika</u> -íi	the cow
	2s	<u>masa</u> ŋ-í	the chief
	3w	<u>nyaha</u> -íi	the woman
	3s	<u>ngulu</u> ŋ-í	the cobra
	4w	<u>kali</u> -íi	the hoe

These stressed non-high tones are derived as follows:

Gloss	the house	the cow	the woman
Base	n-pé ^h lě-í	n-nikaá-í	n-nyahá-í
1. Lowering			
2. HTD			
3. HTA			
4. WSC	n-pé ^h lě-íi	n-nikaá-íi	n-nyahá-íi
5. Stress	n-pé ^h lě-íi	n-nikaá-íi	n-nyahá-íi
6. LTA	n-pé ^h lě-íi	n-nikaá-íi	n-nyahá-íi
7. C Rules	<u>pé</u> lě-íi	<u>nika</u> á-íi	<u>nyaha</u> á-íi
8. Downdrift	<u>pé</u> lě-íi	<u>nika</u> á-íi	<u>nyaha</u> á-íi
9. Cont Red		<u>nika</u> -íi	
Surface	<u>pé</u> lě-íi	<u>nika</u> -íi	<u>nyaha</u> -íi

Class 5 nouns beleng-í 'the trousers' are stressed on the first syllable, as in Mende and Loko. Because a definite class 5 nouns contains only a single high tone, Low Tone Advancement can not apply (see 6.16).

Gloss	the trousers
Base	belen-í
1. Lowering	
2. HID	
3. HTE	
4. WSC	
5. Stress	<u>belen-í</u>
6. LTA	
7. C Rules	<u>beleng-í</u>
8. Downdrift	<u>beleng-í</u>
9. Cont Red	
Surface	<u>beleng-í</u>

Bandi class 6 and 7 nouns do not undergo Low Tone Advancement. Consequently, in these two classes, stress falls on the first high tone of the nominal (see 6.22).

<u>kohing-í</u>	(6) the coffee
<u>dala-íi</u>	(7) the dollar

The occurrence of stress on a non-high tone is a very rare event in the world's languages and difficult to recognize without practice. In order to make sure that this was what was going on in Bandi, a number of permutations of tone and stress were made using Bandi morphemes. Then various Bandi speakers were asked to indicate which ones sounded most like true Bandi. These Bandi speakers concluded un-animously that the examples which had a stressed syllable

immediately preceding the first high tone sounded most like true Bandi. Those examples in which the first high tone of the phrase was stressed were considered to be most like a foreigner's rendition of Bandi. Furthermore, those who had heard Mende spoken could identify the Mende-like version as well.

	the crocodile	the chief	the woman
Bandi	<u>ndamb</u> ang-í	ma <u>sang</u> -í	nyaha- <u>í</u> i
Foreign	ndam <u>b</u> ang-í	masang- <u>í</u>	nyaha- <u>í</u> i
Mende-like	ndam <u>b</u> ang-í	ma <u>sang</u> -í	nyaha- <u>í</u> i

6.4 Possessives

6.41 Familial Possessives

Bandi familial possessives demonstrate the operation of the High Tone Displacement rule. In this construction, the Low Tone Advancement rule does not apply and the High Tone Extension rule has no effect.

Gloss	father	brother	mother
Base	kɛɛ́	ndíá	njéé
my	<u>ní</u> -kɛɛ́	<u>ní</u> -ndíá	<u>ní</u> -njéé
your	<u>í</u> -kɛɛ́	<u>í</u> -ndíá	<u>í</u> -njéé
his	ngi-kɛɛ́	ngi-ndíá	ngi-njéé
our ₁	mu-kɛɛ́	mu-ndíá	mu-njéé
our ₂	ni-kɛɛ́	ni-ndíá	ni-njéé
your	<u>wú</u> -kɛɛ́	<u>wú</u> -ndíá	<u>wú</u> -njéé
their	ti-kɛɛ́	ti-ndíá	ti-njéé

The surface tone of the first syllable of all possessed familial nouns is high because the First High Tone Copying rule copies the high tone of the familial possessive pronouns

(6.23) onto the first syllable of the following familial noun. Following the First High Tone Copying rule, High Loss reduces the rising tones of the pronouns (ngíí 'his', muú 'our₁', níí 'our₂', and tíí 'their') to non-high. Below are some derivations:

Gloss	my father	his father	my brother	his brother
Base	ní-kéǵé	ngíí-kéǵé	ní-ndíá	ngíí-ndíá
1. Lowering				
2. 1st HTC	ní-kééǵé	ngíí-kééǵé	ní-ndíá	ngíí-ndíá
2b. High Loss		ngí-kééǵé		ngí-ndíá
3a. Low Loss				
3b. 2nd HTC				
4. WSC				
5. Stress	<u>ní</u> -kééǵé	ngí- <u>kéé</u> ǵé	<u>ní</u> -ndíá	ngí- <u>ndíá</u>
6. LTA				
7. C Rules	(familial nouns are always strong)			
8. Downdrift	<u>ní</u> -kééǵé	ngí- <u>kéé</u> ǵé		ngí- <u>ndíá</u>
9. Con Red				
Surface	<u>ní</u> -kééǵé	ngí- <u>kéé</u> ǵé	<u>ní</u> -ndíá	ngí- <u>ndíá</u>

6.42 Corporal Possessives

Bandi corporal possessives illustrate the application of the First High Tone Copying rule and the Low Tone Advancement rule. The Second High Tone Copying rule does not apply to this construction.

Bandi first and third person singular corporal possessive pronouns, ní- and ní-respectively, differ from those used in familial possession (see 6.23). The surface tones of Bandi corporal possessives are a result of the interaction of the base tones of the corporal possessive pronoun with the following corporal noun.

Base	kówó 'foot'	tokóó 'hand'	lehú 'life'
my	<u>kó</u> wó-íi	tóko-íi	ndé <u>hú</u> -íi
your	í-wówó-íi	í-lólo-íi	í-le <u>hú</u> -íi
his	<u>kó</u> wó-íi	toko-íi	ndé <u>hú</u> -íi
our ₁	mu-wówó-íi	mu-lóko-íi	mu-le <u>hú</u> -íi
our ₂	ni-wówó-íi	ni-lóko-íi	ni-le <u>hú</u> -íi
your	wú-wówó-íi	wú-loko-íi	wu-le <u>hú</u> -íi
their	ti-wówó-íi	ti-lóko-íi	ti-le <u>hú</u> -íi

In the derivation of the above examples, Low Tone Advancement only applies when the pronoun begins with a non-high tone (ní, muú-, nií-, and tií-) and results in a stressed non-high tone in these forms. Some derivations of coporal possession follow:

Gloss	my foot	your foot	his foot	their foot
Base	n-kówó-í	í-kówó-í	n-kówó-í	tií-kówó-í
1. Lowering				
2a. 1st HFC	n-kówó-í	í-kówó-í		tií-kówó-í
2b. High Loss				ti-kówó-í
3a. Low Loss				
3b. 2nd HFC				
4. WSC	n-kówó-íi	í-kówó-íi	n-kówó-íi	ti-kówó-íi
5. Stress	<u>n</u> -kówó-íi	<u>í</u> -kówó-íi	n-kówó-íi	ti-kówó-íi
6. LTA			n-kówó-íi	ti-kówó-íi
7. C Rules	<u>kó</u> wó-íi	í-wówó-íi	<u>kó</u> wó-íi	ti-wówó-íi
8. Downdrift	<u>kó</u> wó-íi	í-wówó-íi	<u>kó</u> wó-íi	ti-wówó-íi
9. Cont Red				
Surface	<u>kó</u> wó-íi	í-wówó-íi	<u>kó</u> wó-íi	ti-wówó-íi

The stress of the nasal in 'my foot' is transferred to the next syllable to the right when the nasal is eliminated by the Consonant Rules.

Gloss	my arm	your arm	his arm	their arm
Base	<u>n</u> -tokoó-í	<u>i</u> -tokoó-í	n-tokoó-í	tií-tokoó-í
1. Lowering				
2a. 1st HTC	<u>n</u> -tòokoó-í	<u>i</u> -tòokoó-í		tií-tòokoó-í
2b. High Loss				ti-tòokoó-í
3a. Low Loss				
3b. 2nd HTC				
4. WSC	<u>n</u> -tòokoó-íi	<u>i</u> -tòokoó-íi	n-tokoó-íi	ti-tòokoó-íi
5. Stress	<u>n</u> -tòokoó-íi	<u>i</u> -tòokoó-íi	n-tokoó-íi	ti-tòokoó-íi
6. LTA			n-tokoó-íi	
7. C Rules	<u>t</u> òokoó-íi	<u>i</u> -lòokoó-íi	tokoó-íi	ti-lòokoó-íi
8. Downdrift	<u>t</u> òokoó-íi	<u>i</u> -lòokoó-íi	tokoó-íi	ti-lòokoó-íi
9. Cont Red	<u>t</u> ókó-íi	<u>i</u> -lókó-íi	toko-íi	ti-lókó-íi
Surface	<u>t</u> ókó-íi	<u>i</u> -lókó-íi	toko-íi	ti-lókó-íi

6.43 Alienable Possessives

Alienable possessives demonstrate the operation of the Lowering rule, both tone-copying rules, and the Consonant Rules. As in familial possession, Low Tone Advancement does not apply here. The Lowering rule lowers the base tone of possessed alienable nouns, and, consequently, the base tones of these nouns do not figure in the determination of the phonetic surface tones of this construction.

	house péle (1)	chief masáŋ (2)
my	<u>n</u> í+véle-íi	<u>n</u> í+wasáng-í
your	<u>i</u> +véle-íi	<u>i</u> +wasáng-í
his	ngí+ <u>v</u> éle-íi	ngí+ <u>w</u> asáng-í
our ₁	mu+ <u>v</u> éle-íi	mu+ <u>w</u> asáng-í
our ₂	ni+ <u>v</u> éle-íi	ni+ <u>w</u> asáng-í
your	<u>w</u> ú+véle-íi	<u>w</u> ú+wasáng-í
their	ti+ <u>v</u> éle-íi	ti+ <u>w</u> asáng-í

Below are some derivations:

Gloss	my house	their house
Base	ní+péle-í	tií+péle-í
1. Lowering	ní+pele-í	tií+pele-í
2a. 1st HTC	ní+péle-í	tií+péle-í
2b. High Loss		ti+péle-í
3a Low Loss	ní+péle-í	ti+péle-í
3b 2nd HTC	ní+péle-í	ti+péle-í
4 WSC	ní+péle-íi	ti+péle-íi
5. Stress	<u>ní</u> +péle-íi	ti+ <u>péle</u> -íi
6. LTA		
7. C Rules	<u>ní</u> +véle-íi	ti+ <u>vélé</u> -íi
8. Downdrift	<u>ní</u> +véle-íi	ti+ <u>vélé</u> -íi
9. Cont Red	<u>ní</u> +véle-íi	ti+ <u>vélé</u> -íi
Surface	<u>ní</u> +véle-íi	ti+ <u>vélé</u> -íi

The surface tone patterns of the alienable possessives reported here are different from those reported in the revised version of Heydorn's grammar (see 6.0).

Bandi (Dwyer)	<u>ní</u> +véle-íi	my house
Bandi (Heydorn)	ní+vélé-íi	my house
Loko	ní+béle-í	my house

The tonal patterns reported for alienable possessives by Heydorn are identical to those reported here for Loko (5.43). The Loko tonal patterns are derived without the use of the Second High Tone Copying rule. This suggests that the broadening of the Second High Tone Copying rule in Bandi to include alienable possessives is a very recent development.

6.5 Nominal Compounds

Bandi nominal compounds illustrate the application of all of the major Bandi rules: Lowering, both tone-copying

rules, Low Tone Advancement, the Consonant Rules, Downdrift, and Contour Reduction. In nominal compounds, as in inalienable possession, the Lowering rule converts the base tones of the second constituent of the construction to non-high and, consequently, the derived surface tones of nominal compounds are independent of the base tones of the second constituent morphemes.

The second constituent of these nominal compounds may have one of three possible tonal patterns: following classes 1, 2s, 3, and 4, the tonal patterns of the second constituent can be generated by the formula cvcv(cv)₀.

Base	Gloss	Compound	Gloss
pélé (1w)	house	<u>pélé</u> +vóló-íi	the old house
lám báŋ (1s)	crocodile	<u>ndamba</u> +póló-íi	the old crocodile
masáŋ (2s)	chief	<u>masa</u> -póló-íi	the old chief
kondá (3w)	mortar	<u>konda</u> -vóló-íi	the old mortar
ǵalíŋ (3s)	thorn	<u>ngali</u> -póló-íi	the old thorn
káli (4w)	hoe	<u>kalí</u> -vóló-íi	the old hoe

In the derivation of these tonal patterns, the Low Tone Advancement rule applies, resulting in the location of stress on the syllable preceding the first high tone in the compound. This rule application is demonstrated in the following selected derivations:

Gloss	the old house	the old mortar
Base	n-pé ^l é+pó ^l ó-í	n-kondá+pó ^l ó-í
1. Lowering	n-pé ^l é+pó ^l ó-í	n-kondá+pó ^l ó-í
2a. 1st HTC	n-pé ^l é+pó ^l ó ^l -í	n-kondá+pó ^l ó ^l -í
2b. High Loss		
3a. Low Loss	n-pé ^l é+pó ^l ó-í	n-kondá+pó ^l ó-í
3b. 2nd HTC	n-pé ^l é+pó ^l ó ^l -í	n-kondá+pó ^l ó ^l -í
4. WSC	n-pé ^l é+pó ^l ó ^l -íi	n-kondá+pó ^l ó ^l -íi
5. Stress	n-pé ^l é+pó ^l ó ^l -íi	n-kondá+pó ^l ó ^l -íi
6. LTA	n-pé ^l é+pó ^l ó ^l -íi	n-kondá+pó ^l ó ^l -íi
7. C Rules	pé ^l é+vó ^l ó ^l -íi	kondá+vó ^l ó ^l -íi
8. Downdrift	pé ^l é+vó ^l ó ^l -íi	kondá+vó ^l ó ^l -íi
9. Cont Red	pé ^l é+vó ^l ó ^l -íi	kondá+vó ^l ó ^l -íi
Surface	pé ^l é+vó ^l ó ^l -íi	kondá+vó ^l ó ^l -íi

Gloss	the old crocodile
Base	n-lámbá ^h η+pó ^l ó-í
1. Lowering	n-lámbá ^h η+pó ^l ó-í
2a. 1st HTC	n-lámbá ^h η+pó ^l ó ^l -í
2b. High Loss	
3a. Low Loss	n-lámbá ^h η+pó ^l ó-í
3b. 2nd HTC	n-lámbá ^h η+pó ^l ó ^l -í
4. WSC	n-lámbá ^h η+pó ^l ó ^l -íi
5. Stress	n-lámbá ^h η+pó ^l ó ^l -íi
6. LTA	n-lámbá ^h η+pó ^l ó ^l -íi
7. C Rules	ndambá+pó ^l ó ^l -íi
8. Downdrift	ndambá+pó ^l ó ^l -íi
9. Cont Red	ndambá+pó ^l ó ^l -íi
Surface	ndambá+pó ^l ó ^l -íi

The tonal pattern of the second constituent of nominal compounds which follow class 2w nouns can be generated by the formula: ovov'(ov)o .

	Base	Gloss	Compound	
2w	kalií	snake	kali+v ₂ ol ₂ -íi	the old snake
2w	nikaa	cow	nika+v ₂ ol ₂ -íi	the old cow
2w	pelee	road	pele+v ₂ ol ₂ -íi	the old road

In these examples, both high-tone copying rules apply as does the Low Tone Advancement rule. In this situation, however, the Low Tone Advancement rule advances the non-high tone onto the first syllable of the second constituent, and, consequently, stress is on the syllable which precedes the first surface high tone.

Gloss	the old snake
Base	n-kalií+p ₂ ol ₂ -í
1. Lowering	n-kalií+p ₂ ol ₂ -í
2a. 1st HTC	n-kalií+p ₂ ol ₂ -í
2b. High Loss	n-kali+p ₂ ol ₂ -í
3a. Low Loss	n-kali+p ₂ ol ₂ -í
3b. 2nd HTC	n-kali+p ₂ ol ₂ -í
4. WSC	n-kali+p ₂ ol ₂ -íi
5. Stress	n-kali+p ₂ ol ₂ -íi
6. LTA	n-kali+p ₂ ol ₂ -íi
7. C Rules	kali+v ₂ ol ₂ -íi
8. Downdrift	kali+v ₂ ol ₂ -íi
9. Cont. Red	kali+v ₂ ol ₂ -íi
Surface	kali+v ₂ ol ₂ -íi

Following class 5, 6 and 7 nouns, which are presumed to be borrowed, neither of the high-tone copying rules nor the Low Tone Advancement rule applies, and, consequently, the tones

of the second constituent following nouns of all of these classes are non-high.

	base	gloss	the old _____ (surface)
5	bɛlɛŋ	trousers	bɛlɛ+pɔlɔ-íí
6	kɔhíŋ	coffee	kɔhí+pɔlɔ-íí
7	dála	dollar	dála+vɔlɔ-íí

The high-tone copying rules do not apply to any of the borrowed classes. Classes 5 and 7 end in a non-high tone and thus do not fit the structural description of these rules.

Class 6 nouns do fit the structural description of the high-tone copying rules, but no high-tone copying is observed.

This class must be made an exception to high tone copying.

Low Tone Advancement also does not apply to these examples; in fact, none of the borrowed tone classes undergo any of the tone copying rules.

Gloss	the old trousers	the old coffee	the old dollar
Base	bɛlɛŋ+pɔlɔ-í	kɔhíŋ+pɔlɔ	dála+pɔlɔ-í
1. Lowering	bɛlɛŋ+pɔlɔ-í	kɔhíŋ+pɔlɔ-í	dála+pɔlɔ-í
2a. 1st HTE			
2b. High Loss			
3a. Low Loss			
3b. 2nd HTE			
4. WSC	bɛlɛŋ+pɔlɔ-íí	kɔhíŋ+pɔlɔ-íí	dála+pɔlɔ-íí
5. Stress	<u>bɛlɛ</u> ŋ+pɔlɔ-íí	kɔ <u>hí</u> ŋ+pɔlɔ-íí	<u>dála</u> +pɔlɔ-íí
6. LTA			
7. C Rules	<u>bɛlɛ</u> +pɔlɔ-íí	kɔ <u>hí</u> +pɔlɔ-íí	<u>dála</u> +vɔlɔ-íí
8. Downdrift	<u>bɛlɛ</u> +pɔlɔ-íí	kɔ <u>hí</u> +pɔlɔ-íí	<u>dála</u> +vɔlɔ-íí
9. Cont Red			
Surface	<u>bɛlɛ</u> +pɔlɔ-íí	kɔ <u>hí</u> +pɔlɔ-íí	<u>dála</u> +vɔlɔ-íí

When a Bandi nominal compound is embedded in another nominal compound, the tones of the third constituent are always non-high.

Underlying	[[masáŋ+íélé]+póló]-í	[chief+house]+old]
Surface	masa+pélé+vóló-íi	the old royal house

Were the Bandi high-tone copying rules to apply cyclically as they do in Loko, the incorrect **masa+pélé+vóló-íi would be derived. The simplest explanation of this is that the high-tone copying rules do not apply cyclically in Bandi.

6.6 Summary

The major rule difference between Bandi and Loko is Low Tone Advancement. The grammatical distribution of this rule is peculiar. It applies to nominals which begin with n_2- and to corporal possessives. A possible explanation of this peculiar distribution is offered in 10.5.

Although Bandi appears to be tonally very similar to Loko, its phonological development more closely parallels that of Loma. Of particular importance are the restructuring of morpheme-final short falling tones (6.2 and 7.2), the Low Tone Advancement rule corresponding to High Tone Advancement in Loma (5.1 and 7.1) and the corporal possessive pronoun \acute{n}_- 'my', corresponding to n_- in Loma (see chapters 9, 10, and 11).

Again, I emphasize that the positing of underlying nasals (such as the above \acute{n}_-) is historically motivated. The synchronic status of these nasals is further discussed in chapter 14.

Chapter 7

Loma Tone

7.0 The Loma [lɔma, or loɣoma] language is spoken in the Republics of Guinea and Liberia. It is impossible at this time to say how many distinct dialects of Loma there are. Various published sources list the following: Wiema, Ziema, Wubomai, Gizima¹, and Gbunde. These terms are derived from the names of either geographical areas or political divisions. The Loma people are referred to by many names: [balu] by the Mende, [buzi] by the people of the Liberian coast, and [toma] in the Republic of Guinea. In print, the length of the o in Loma is usually omitted.

The two published accounts of this language are: Untangled Loma (Sadler 1951) and La Langue Loghoma (Prost 1967). Untangled Loma is the pedagogical precursor of Sadler's doctoral thesis, The Loma Language (1952?). These accounts describe the Gizima dialect, spoken around the Zorzor area of Lofa County, Liberia.

La Langue Loghoma deals with the dialect of Loma spoken in the Republic of Guinea. This grammar contains very little information on tone. Because Prost refers the reader to the earlier Sadler work, which contains a detailed discussion of tone, it can be assumed that

Guinean Loma is very similar to that described by Sadler.

The tonal analysis presented in the first part of this chapter (sections 7.1-7.5) is of the Gbunde dialect of Loma, and in these sections, all references to Loma imply the Gbunde dialect only. The tonal data for the Gbunde dialect was provided by Mr. Koli Malu from Voinjama, Lofa County, Liberia. Following the presentation of the Gbunde (Loma-Gb) dialect, a brief summary of Sadler's (1952) tonal analysis of the Gizima dialect of Loma (Loma-Gz) is presented.

Of all the SWM languages, Loma has the most complicated history of tonal development. Tonally, Loma most closely resembles Bandi, differing primarily by a diachronic process which inverted the surface tones of Loma. As a result of this process, high tones become non-high tones, non-high tones become high tones, and rising tones become falling tones (see chapter 13).

Bandi	pele+woléng-í	the white road
Loma	pélé+wóleg-í	the white road

In addition to having undergone tonal inversion, Loma has undergone several rule broadenings. These broadenings account for the other tonal discrepancies between Loma and Bandi. When I asked Mr. Lamin, my Mende teacher, what his impressions of Balu (the Mende term for Loma) were, he replied that the Balu speak "upside down." This is as apt a description of the historical development of Loma as one could want, though it is only fair to

add that "upside down" in this context could also mean "all mixed up."²

7.1 Rules

The process of Tonal Inversion affected both Loma rules and base forms. In the following rules, for example, the Loma Raising rule corresponds to the Lowering rule of the other SWM languages. Likewise, Loma Low Tone Spread, Low Loss and High Tone Advancement correspond to Bandi High Tone Copying, High Loss, and Low Tone Advancement respectively.

The Loma tone spreading rules (1-6) transfer tones to the right, but the rules themselves apply regressively. That is, given a sequence of n morphemes numbered 1 to n from left to right, the tones are spread onto the last morpheme n from the preceding morpheme, n-1, and then onto morpheme n-1 from morpheme n-2, and so on until the process halts after spreading the tone of morpheme 1 onto morpheme 2. Although the need has not arisen for specifying the direction of application of the rules which I have proposed for the other SWM languages, Loma tone rules must apply regressively. Were Loma tone rules to apply progressively, these rules would copy the final tone of the initial morpheme of a nominal phrase onto each subsequent morpheme in the phrase, so that most constructions would have either all high tones or all non-high tones. For example these rules would produce:

**kómíg-í	instead of	kómíg-i	the bee	(7.3)
**e-wo.og-i		e-wo.og-í	your belly	(7.4)
**púnóg-í		púnóg-i	my intestine	(7.4)

Because of the iterative nature of Loma tone rules, the derivations given in this chapter follow a slightly different format. Each run through the rules has a heading (e.g., Suffix, Adjective, Noun) which refers to the morpheme to which the rules are applying.

7.11 Raising

The Loma Raising rule, which corresponds to the Lowering rule of the other SWM languages, raises the underlying tones of the second and succeeding constituents of nominal compounds and possessed alienable nouns to high. The noun-phrase prefix n̂- (see 7.2) is not considered to be a constituent of the nominal compound, nor is the definite suffix.

Raising

$$v \rightarrow \acute{v} / [(\dots+)_{1\dots} \text{---} \dots] \begin{matrix} \text{Nominal Comp.} \\ \text{Alienable Poss.} \end{matrix}$$

(where $(\dots+)_{1\dots}$ indicates one or more constituents)

7.12 Low Tone Spread

The Loma Low Tone Spread rule incorporates the effects of the First and Second High Tone Copying rules of Bandi and Loko. Loma Low Tone Spread lowers the tones of a particular morpheme if the preceding morpheme ends in a non-high tone.

Low Tone Spread(LTS)

$$\acute{v} \rightarrow v / [(\dots v)_1 + \dots _ \dots + \dots]_{\text{Nominals}}$$

7.13 Low Loss

The Low Loss rule corresponds to High Loss in the other SWM languages. It states that a falling tone is reduced to a simple high tone. Because this rule is preceded by LTS, the falling tone will always be followed by a non-high tone so that it is not necessary to include a following non-high tone in the structural description of this rule.

Low Loss

$$v \rightarrow \acute{v} / \acute{v} _ + \quad (\text{where } \acute{v}\acute{v} = \acute{v} \text{ see 2.4})$$

7.14 Optional Weak Suffix Tone Raising

This rule is the only optional tone rule in Loma. Its effect is limited, for it only results in the tonal paraphrase of a nominal compound in which the leading constituent is a class 2w noun and the second constituent is a weak-conditioning noun (see 7.4 and 7.5). Further discussion of this rule appears in 7.16.

Optional Weak Suffix Tone Raising(WSR-OP)

$$v \rightarrow \acute{v} / _ - \acute{v} \quad (\text{not } _ \eta - \acute{v})$$

7.15 High Tone Advancement

Loma High Tone Advancement corresponds to the Low Tone Advancement rule of Bandi. The Loma rule, unlike

its Bandi counterpart, advances a high tone onto the next morpheme for as many syllables as is possible (the Bandi rule advances a non-high tone only one syllable to the right). Loma High Tone Advancement will not raise a non-high tone if the non-high tone is followed by a high tone in the same morpheme or following suffix. Correspondingly, the Bandi Low Tone Advancement rule will not lower a high tone if the high tone is immediately followed by a non-high tone.

High Tone Advancement (HTA)

$$v \rightarrow \acute{v} / [(\dots\acute{v})_1 + \dots _ \dots + \dots]_{\text{Nominals}}$$

(except when v is followed by $(c)\acute{v}$ in the same morpheme or following suffix)

7.16 Obligatory Weak Suffix Tone Raising

This rule states that a non-high-toned vowel followed by a high-toned suffix (without an intervening consonant) is changed to a high tone.

Obligatory Weak Suffix Tone Raising (WSR-OB)

$$v \rightarrow \acute{v} / _ - \acute{v} \quad (\text{not } _ \eta - \acute{v})$$

The above listing contains two Weak Suffix Tone Raising rules: one of which is obligatory, the other optional. The obligatory rule states that a morpheme-final non-high-toned vowel becomes high when preceded by a high tone and followed by a high-toned suffix (without an intervening consonant). The optional version of this rule appears earlier in the ordered list of rules and has

a broader range of application. This rule states that any morpheme-final non-high tone may become high if it is followed by a high-toned suffix. It seems quite likely that the optional rule is an outgrowth of the obligatory version of the rule. If this is so, then it appears to be a case of a language change (rule reordering and simplification) in progress.³ If this is correct, then it might be expected that the change will become complete when the optional rule becomes obligatory and completely replaces the older obligatory rule.

7.17 Weak Suffix Assimilation

This rule states that a non-high-toned definite suffix becomes high following a morpheme which ends in a high tone providing that there is no intervening nasal consonant.

Weak Suffix Assimilation (WSA)

$v \rightarrow \acute{v} / \acute{v}__ \text{ (but not } \acute{v}\eta__ \text{)}$

7.18 Consonant Rules (C Rules)

These rules deal with the interaction of morpheme-final nasals with following initial consonants, and with initial consonants which are not preceded by these nasals. The historical development of these rules is summarized in 3.2 and in chapter 14. The effects of these rules in Loma are summarized in Figure 7.1 below. For each series, the underlying consonants are given in the left-hand column, the corresponding weak consonants in the middle

column, and the corresponding strong consonants in the right-hand column.

Light Series			Heavy Series			Nasal Series		
Base	Weak	Strong	Base	Weak	Strong	Base	Weak	Strong
p	w/_V _{bk} b	p	b	w/_V _{bk} b	b	m	m	m
f	v	f						
t	l	t	l	l	d	n	n	n
s	z	s	y	y	z	ny	ny	ny
k	ŋ/_Ṽ w/_V _{rd} ʒ	k	ʒ	ŋ/_Ṽ w/_V _{rd} ʒ	g	ŋ	ŋ	ŋ
kp	b	kp						

Figure 7-1: Loma consonant alternation.

The strong consonants of the light and heavy series are phonetically fortis (e.g., pp, bb, etc.). These have not been transcribed as such in this chapter because there is no opposition between geminate and non-geminate consonants (all the non-geminates are weak) and because existing orthographies do not represent Loma fortis consonants as geminate.

7.19 Downdrift

Despite the addition of new rules, Loma Downdrift remains as the end of the ordered list of rules. Interestingly, Loma Downdrift is the only rule which remains unaffected by the tonal inversion process (13.1). This observation suggests either that the Downdrift rule is symmetrical, or that somehow it is not the same as ordinary phonological rules.⁴

7.2 Base Forms

7.21 Though Loma strong and weak initial consonants are slightly different from those found in Loko and Bandi, their conditioning environments are, for the most part, the same. Like Bandi and Loko, Loma has two morphological subtypes: strong-conditioning and weak-conditioning morphemes.

Historically, Loma strong-conditioning morphemes usually correspond to Kpelle nouns which end in a nasal consonant. It is the interaction of the morpheme-final nasal and the following initial consonant which results in the surface strong initial consonant. Initial consonants which are not preceded by an underlying nasal consonant are weak.

Despite the insufficient synchronic evidence for a full proof of the presence of this morpheme-final nasal in a synchronic grammar of Loma, strong-conditioning morphemes are marked in this chapter with an underlying morpheme-final nasal. Additional discussion of this matter appears in chapter 14. Alternative, more concrete synchronic grammars will have to treat this phenomenon with more arbitrary features and less well motivated consonantal rules.

7.22 In order to facilitate comparison of Loma nouns with their cognates in the other SWM languages, the Proto-SWM tone class has been identified for each Loma noun presented in this chapter, though, because of a

number of mergings, most of these tonal classes have little synchronic validity for Loma.

While it is necessary for the base forms of Loma class 2w nouns to begin with a high tone in order for the High Tone Advancement rule to produce the desired results, the initial tone of the remaining "native" SWM tone classes (1, 3, and 4) is indeterminate from the synchronic data. These indeterminate tones have been considered (somewhat arbitrarily) to be non-high, [-high, -low]. This tone, which is presumably the least marked, is identical to the following non-high tone. Many of the members of class 7s and 9w tonal classes are what I have called quasi-cognates. Quasi-cognates are those nouns which can be regularly derived from their Proto-SWM proto-types with respect to their segmental make-up but not with respect to their tone pattern (see 13.2). Classes 6-9 appear to be recent borrowings and generally do not take the noun-phrase prefix \acute{n}_2 -. The percentage of recent borrowings in Loma is quite low in my data.

	pattern	example	gloss
Class 1w	cvcv	pɛlɛ	house
1s	cvcvɲ	kominɲ	bee
2w	c'vc'v	lɔ́b'ɔ	bush
2s	cvcvɲ	masanɲ	chief
3w	cvcv	ʒete	mortar
3s	cvcvɲ	ʒalinɲ	thorn
4w	cvcv	kali	hoe
5	c'vc'v	no examples	
6w	cvc'v	dɔ́bá	dumboy (a kind of food)
7w	c'vcv	kíci	kitchen
7s	c'vcvɲ	ʒuluɲ	cobra ⁵
8w	cvcv	baza	rice bird
9w	c'vcv	túkɔ	staff

7.23 The surface tones of most Loma nouns are high when they occur as the leading noun of a noun phrase. This is true of nouns which have high underlying tones and nouns which have non-high underlying tones. These high surface tones are, in many cases, the result of the High Tone Advancement rule and the nominalizing prefix \acute{n}_2 -. This prefix is cognate with the non-high-toned nasal prefix, \underline{n}_2 -, of Loko and Bandi and the prefix of prerule, \grave{n}_2 -, of Kpelle (see 8.2). Because this morpheme is prefixed to most noun-phrase initial nouns, as in Loko and Bandi, most noun-phrase initial nouns begin with a strong consonant. The derivation of these constructions (\acute{n}_2 -noun) involving the application of the High Tone Advancement rule is presented in 7.3.

7.24 Like Loko and Bandi, Loma has two sets of possessive pronouns. In Loko and Bandi, one set is used for corporal possession and the other for familial and alienable possession. But in Loma, one set is used for alienable possession and the other for inalienable (corporal and familial) possession. The base forms of these pronouns are as follows:

	inalienable	alienable
my	n	nan
your(sg)	e	ya or ja (in apparent free variation)
his	ń	nań
our ₁	gíi	gáa
our ₂	díi	dáa
your(pl)	wo	wa
their	tíi	táa

The alienable pronouns are derivable from the inalienable possessive pronouns by the addition of the formative a (of unknown meaning). Except for the second person singular alienable possessive pronoun (ea > ya or ja), the segmental values of the pronoun are completely lost. Because the final nasal of the first and third person pronouns always interacts with the following initial consonants to produce strong consonants, this nasal never appears as a surface nasal. The tone of these pronouns is realized on the following morpheme. The final nasals of the first and third person singular alienable possessive pronouns appear to represent anaphoric pronouns (i.e., na-n 'mine, my').

7.3 Nominal Suffixes

The tonal behavior of the noun-suffix constructions is typified by that of the definite, citation form. This construction demonstrates the application of the LTS, High Loss, WSR-OB, and the Downdrift tone rules.

The most common definite suffix in Loma may be said to have two allomorphs: a strong allomorph -gi (following morphemes ending in an underlying nasal consonant) and a weak allomorph -i (following morphemes ending in an underlying oral vowel).⁶ Historically, the *g* of the strong definite suffix allomorph developed from the preceding morpheme-final nasal η ($\eta > ng > g$ see 3.2) and is treated as such in this chapter.

The following examples and derivations involve constructions which have strong definite suffixes, and, consequently, the weak suffix tone rules do not apply. The definite suffix when preceded by the consonant η has a high surface tone following nouns ending in a high tone and a non-high surface tone following nouns ending in a non-high tone.

Base		Surface	Gloss
komi η	(1s)	kómíg-i	the bee
masa η	(2s)	máság-i	the chief
gulu η	(7s)	gúlug-í	the cobra

These surface forms are derived as follows:

Gloss		the bee	the chief	the cobra
Base		ń-komiŋ-í	ń-masaŋ-i	ń-ɣuluŋ-í
Suf	2. LTS			
	3. Low Loss			
	4. WSR-OP			
	5. HTA			ń-ɣuluŋ-í
	6. WSR-OB			
	7. WSA			
Noun	2. LTS			
	3. Low Loss			
	4. WSR-OP			
	5. HTA	ń-kómiŋ-í	ń-másáŋ-i	ń-ɣúluŋ-í
	6. WSR-OB			
C Rules		kómig-i	máság-i	gúlug-í
Downdrift				gúlug-í
Surface		kómig-i	máság-i	gúlug-í

When the definite suffix is not preceded by a consonant, both suffix rules apply unless both the suffix and the preceding vowel have non-high tones, as in the derivation of the following examples:

Base	Surface	Gloss
kíci (7w)	kíci-i	the kitchen
basa (8w)	basa-i	the rice bird

Because class 7w and 8w nouns do not take the \underline{n}_2 - prefix, only one run through the rules is necessary.

Gloss		the kitchen	the rice bird
Base		kíci-i	baza-i
1. Raising			
Suf	2. LTS		
	3. Low Loss		
	4. WSR-OP		
	5. HTA		
	6. WSR-OB		
	7. WSA		
8. C Rules			
9. Downdrift			
Surface		kíci-i	baza-i

In the next set of examples, the high tone of the suffix results from either Weak Suffix Assimilation or High Tone Spread.

Base		Surface	Gloss
pɛɛ	(1w)	péɛ-í	the house
lɔ́bɔ́ɔ	(2w)	dɔ́bɔ́-í	the bush
dɔ́bá	(6w)	dɔ́bá-í	the dumboy

Gloss	the house	the bush	the dumboy
Base	ń-péle-i	ń-lóǎǎ-i	dǎbá-i
1. Raising			
Suf 2. LTS			
3. Low Loss		ń-lóǎǎ-i	
4. WSR-OP			
5. HTA		ń-lóǎǎ-í	dǎbá-í
6. WSR-OB			
7. WSA			
Noun 2. LTS			
3. Low Loss			
4. WSR-OP			
5. HTA	ń-péle-i		
6. WSR-OB			
7. WSA	ń-péle-í		
8. C Rules	péle-í	dǎǎǎ-í	
9. Downdrift			dǎbǎ-í
Surface	péle-í	dǎǎǎ-í	dǎbǎ-í

7.4 Possessives

7.41 Familial Possessives

Both Loma corporal possessives and Loma familial possessives use the same set of possessive pronouns. They also use the same tonal rules: LTS, Low Loss, WSR-OP, HTA, WSR-OB, WSA, and Downdrift. Because the derivations of corporal and familial possessives are identical, no examples of derivations of familial possessives are given in this chapter. Examples of Loma familial possessives are given in 3.54.

7.42 Corporal Possessives

Corporal possessives also demonstrate the regressive application of Loma tone rules. As in the case of the

definite form, examples involving strong-conditioning corporal nouns are given first because in this situation, the weak-suffix rules do not apply. In the following paradigms, pun_oŋ 'bottom' has underlying non-high tones, and k_o.óŋ 'belly' has underlying high tones:

	bottom	belly
my	pun _o ŋ-i	ko.og-í
your(sg)	e-wun _o ŋ-i	e-wo.og-í
his	pún _o ŋ-i	kó.óg-í
our ₁	gí-wún _o ŋ-i	gí-wó.og-í
our ₂	dí-wún _o ŋ-i	dí-wó.og-í
your(pl)	wo-wun _o ŋ-i	wo-wo.og-í
their	tí-wún _o ŋ-i	tí-wó.og-í

These possessives are derived as follows:

Gloss	his belly	your belly	their belly
Base	n-kó.óŋ-i	e-kó.óŋ-i	tíi-kó.óŋ-i
1. Raising			
Suf 2. LTS			
3. Low Loss			
4. WSR-OP			
5. HTS	n-kó.óŋ-í	e-kó.óŋ-í	tíi-kó.óŋ-í
6. WSR-OB			
7. WSA			
Noun 2. LTS		e-ko.oŋ-í	tíi-ko.oŋ-í
3. Low Loss			tí-ko.oŋ-í
4. WSR-OP			
5. HTA			tí-kó.oŋ-í
6. WSR-OB			
7. WSA			
8. C Rules	kó.óg-í	e-wo.og-í	tí-wó.og-í
Downdrift		e-wo.og-í	tí-wó.og-í
Surface	kó.óg-í	e-wo.og-í	tí-wó.og-í

Gloss	his bottom	your bottom	their bottom
Base	ń-punǎŋ-i	e-punǎŋ-i	tíi-punǎŋ-i
1. Raising			
Suf 2. LTS			
3. Low Loss			
4. WSR-OP			
5. HTA			
6. WSR-OB			
7. WSA			
Noun 2. LTS			
3. Low Loss			tí-punǎŋ-i
4. WSR-OP			
5. HTA	ń-púnǎŋ-i		tí-púnǎŋ-i
6. WSR-OB			
7. WSA			
8. C Rules	púnǎŋ-i	e-wunǎŋ-i	tí-wúnǎŋ-i
9. Downdrift			
Surface	púnǎŋ-i	e-wunǎŋ-i	tí-wúnǎŋ-i

When the corporal noun is weak-conditioning (the base form ends in an oral vowel), all of the weak-suffix tone rules may apply. The following paradigm shows the surface tonal patterns of all of the possessed forms of kɔwɔ 'foot' and nyátáa 'tendon'.

	foot	tendon	
my	kɔwɔ-i	nyátá-í	
your(sg)	e-wɔwɔ-i	e-nyátá-í	
his	kɔwɔ-í	nyátá-í	
our ₁	gí-wɔwɔ-í	gí-nyátá-í	or gí-nyátá-í
our ₂	dí-wɔwɔ-í	dí-nyátá-í	gí-nyátá-í
your	wo-wɔwɔ-i	wo-nyátá-í	
their	tí-wɔwɔ-í	tí-nyátá-í	tí-nyátá-í

The tonal paraphrases in the above examples are due to the

Optional Weak Suffix Raising rule which has applied in the examples on the extreme right. Following are some examples:

Gloss	his foot	his tendon	your tendon
Base	ń-kɔwɔ-i	ń-nyátáa-i	e-nyátáa-i
1. Raising			
Suf 2. LTS			
3. Low Loss		ń-nyátá-i	e-nyátá-i
4. WSR-OP			
5. HTA		ń-nyátá-í	e-nyátá-í
6. WSR-OB			
7. WSA			
Noun 2. LTS			e-nyata-í
3. Low Loss			
4. WSR-OP			
5. HTA	ń-kɔwɔ-i		
6. WSR-OB			e-nyata-í
7. WSA	ń-kɔwɔ-í		
8. C Rules	kɔwɔ-í	nyátá-í	
9. Downdrift			e-nyatá-í
Surface	kɔwɔ-í	nyátá-í	e-nyatá-í

Gloss	their foot	their tendon	
Base	tíi-k _ŋ w _ŋ -i	tíi-nyátáa-i	
1. Raising			
Suf 2. LTS			
3. Low Loss		tíi-nyátá-i	
4. WSR-OP			
5. HTA		tíi-nyátá-í	
6. WSR-OB			
7. WSA			
Noun 2. LTS		tíi-nyata-í	
3. Low Loss	tí-k _ŋ w _ŋ -i	tí-nyata-í	
4. WSR-OP			----> tí-nyatá-í
5. HTA		tí-nyátá-í	
6. WSR-OB		tí-nyátá-í	
7. WSA			
8. C Rules	tí-w _ŋ w _ŋ -i		
9. Downdrift			tí-nyatá-í
Surface	tí-w _ŋ w _ŋ -i	tí-nyátá-í	tí-nyatá-í

7.43 Alienable Possessives

Alienable possession in Loma differs tonally from inalienable possession by the effects of the Raising rule. The possessive pronouns are slightly different in segmental form from their inalienable counterparts, but this does not affect the tonal patterning of these pronouns (see 7.24). The Raising rule changes the base tones of the possessed alienable nouns prior to the application of any of the tone-spreading rules. The following paradigms show the surface tonal patterns of all of the possessed forms of xalon 'moon', masan 'chief', and xulun' 'cobra'.

	moon	chief	cobra
my	na-ŋalog-í	na-masag-í	na-gulug-í
your(sg)	ja-xalog-í	ja-masag-í	ja-xulug-í
his	na-ŋalog-í	na-masag-í	na-gulug-í
our ₁	ga-xalog-í	ga-masag-í	ga-xulug-í
our ₂	da-xalog-í	da-masag-í	da-xulug-í
your(pl)	wa-xalog-í	wa-masag-í	wa-xulug-í
their	ta-xalog-í	ta-masag-í	ta-xulug-í

Despite the different underlying tones of these nouns, these paradigms display identical tone patterns. This is due to the effect of the Raising rule, which changes the base tones of these nouns to high when possessed. Below are some derivations:

Gloss	his moon	your moon	their chief
Base	nań-xalon-i	ya-xalon-i	taa-masan-i
1. Raising	nań-xalón-i	ya-xalón-i	taa-masán-i
Suf 2. LTS			
3. Low Loss			
4. WSR-OP			
5. HTA	nań-xalón-í	ya-xalón-í	taa-masán-í
6. WSR-OB			
7. WSA			
Noun 2. LTS		ya-xalon-í	taa-masan-í
3. Low Loss			ta-masan-í
4. WSR-OP			
5. HTA			ta-masan-í
6. WSR-OB			
7. WSA			
8. C Rules	na-ŋalog-í	ya-xalog-í	ta-masag-í
9. Downdrift		ya-xalog-í	ta-masag-í
Surface	na-ŋalog-í	ya-xalog-í	ta-masag-í

When the possessed alienable noun is a weak-conditioning noun, Weak Suffix Raising applies and the following tonal patterns occur:

	pɛɛ house	pélée road
my	na-pelě-í	na-pelě-í
your(sg)	ja-velě-í	ja-velě-í
his	ná-pélé-í	ná-pélé-í
our ₁	gá-velě-í	gá-velě-í
our ₂	dá-velě-í	dá-velě-í
your(pl)	wa-velě-í	wa-velě-í
their	tá-velě-í	tá-velě-í

These surface tones are derived by the same list of rules as those given in the preceding derivation.

Gloss	his house	your house
Base	nán-pelɛ-i	ya-pelɛ-i
1. Raising	nán-pélé-í	ya-pélé-í
Suf 2. LTS		
3. Low Loss		
4. WSR-OP		
5. HTA	nán-pélé-í	ya-pélé-í
6. WSR-OB		
7. WSA		
Noun 2. LTS		ya-pelɛ-í
3. Low Loss		
4. WSR-OP		
5. HTA		
6. WSR-OB		ya-pelě-í
7. WSA		
8. C Rules	ná-pélé-í	ya-velě-í
Downdrift		ya-velě-í
Surface	ná-peléí	ya-velě-í

The effect of the Optional Weak Suffix Raising rule is demonstrated in the following derivation:

Gloss	their house	
Base	tíi-pele-i	
1. Raising	tíi-pélé-i	
Suf	2. LTS	
	3. Low Loss	
	4. WSR-OP	
	5. HTA	tíi-pélé-i
	6. WSR-OB	
	7. WSA	
Noun	2. LTS	tíi-pele-i
	3. Low Loss	tí-pele-i
	4. WSR-OP	-----> tí-pélé-i
	5. HTA	tí-pele-i
	6. WSR-OB	tí-pélé-i
	7. WSA	
8. C Rules	tí-vélé-i	ti-velé-i
9. Downdrift		tí-velé-i
Surface	tí-vélé-i	tí-velé-i

7.5 Nominal Compounds

The tonal patterns found in Loma compounds are the same as those found in alienable possession and are a consequence of the same tonal rules. The Raising rule applies first and converts the base tones of the second and succeeding constituents of these nominal compounds to high tones (the nominal prefix \underline{n}_2 - is not considered to be a constituent of the nominal compound). Consequently, the third and subsequent constituents of Loma nominal compounds have high surface tones.

másá+pele+wóóza+nííné-í
 chief+house+long+new-the
 the new long royal house

The Raising rule also applies to possessives in which the possessed noun is a compound.

na+pele+wóózá+nííné-í
 my+house+long+new-the
 my new long house

The Raising rule is followed by as many applications of the Low Tone Spread, Low Loss, High Tone Advancement, and weak suffix rules as are necessary to completely spread the tones of each morpheme onto the next.

Because the Optional Weak Suffix Raising rule produces tonal paraphrases, examples and derivations in which this rule does and does not apply are given. In the following compounds, kolen 'white' and polo 'old' are used as the second constituents. The first set of these examples of nominal compounds demonstrates the tonal behavior of nominal compounds in which the first constituent ends in a non-high tone.

first constituent		the white_____	the old_____
pele (lw)	house	pélé+woleg-í	pélé+wóló-í
komin (ls)	bee	kómi+koleg-í	kómi+poló-í
baza (8w)	rice bird	baza+woleg-í	baza+wóló-í
túkpo (9w)	staff	túkpo+woleg-í	túkpo+wóló-í

These examples are derived as follows:

Gloss	the white house the old house	
Base	ń-pele+kolen-i	ń-pele+polo-i
1. Raising	ń-pele+kólén-i	ń-pele+póló-i
Suf 2. LTS		
3. Low Loss		
4. WSR-OP		
5. HTA	ń-pele+kólén-í	ń-pele+póló-í
6. WSR-OB		
7. WSA		
Adj 2. LTS	ń-pele+kolen-í	ń-pele+polo-í
3. Low Loss		
4. WSR-OP		----> ń-pele+póló-í
5. HTA		
6. WSR-OB		ń-pele+póló-í
7. WSA		
Noun 2. LTS		
3. Low Loss		
4. WSR-OP		
5. HTA	ń-pélé+kolen-í	ń-pélé+polo-í ń-pélé+polo-í
6. WSR-OB		
7. WSA		
8. C Rules	pélé+woleg-í	pélé+wolón-í pélé+woló-í
9. Downdrift	pélé+woleg-í	pélé+wolón-í pélé+woló-í
Surface	pélé+woleg-í	pélé+wolón-í pélé+woló-í

As can be seen, the choice of the Optional Weak Suffix Raising rule does not produce any difference in the surface realization in the above examples.

Class 8w nouns (baza 'rice bird') and class 9w nouns (túkpo 'staff') do not take the nominal prefix when they are used as the leading noun in a nominal phrase as indicated in 7.22. Therefore, these nouns in

the following examples do not have all high surface tones:

Gloss	the white staff	the white rice bird
Base	túkpo+kolen-i	baza+kolen-i
1. Raising	túkpo+kóléń-i	baza+kóléń-i
Suf 2. LTS		
3. Low Loss		
4. WSR-OP		
5. HTA	túkpo+kóléń-í	baza+kóléń-í
6. WSR-OB		
7. WSA		
Adj 2. LTS	túkpo+kolen-í	baza+kolen-í
3. Low Loss		
4. WSR-OP		
5. HTA		
6. WSR-OB		
7. WSA		
8. C Rules	túkpo+woleg-í	baza+woleg-í
Downdrift	túkpo+woleg-í	baza+woleg-í
Surface	túkpo+woleg-í	baza+woleg-í

The next examples demonstrate the tonal behavior of nominal compounds in which the first constituent ends in a falling tone.

first constituent	the white _____	the old _____
níkáa (2w) cow	níká+wóleg-í	níká+wóló-í
		or níká+wóló-í
pélee (2w) road	péle+wóleg-í	péle+wóló-í
		or péle+wóló-í

The following derivations show how the above tonal paraphrases arise as the result of the optionality of the WSR-OP rule:

Gloss	the white cow	the old cow	
Base	ń-níkáa+koleŋ-i	ń-níkáa+pólŋ-i	
1. Raising	ń-níkáa+kóléŋ-i	ń-níkáa+pólŋ-i	
Suf	2. LTS		
	3. Low Loss		
	4. WSR-OP		
	5. HTA	ń-níkáa+kóléŋ-í	ń-níkáa+pólŋ-í
	6. WSR-OB		
	7. WSA		
Adj	2. LTS	ń-níkáa+koleŋ-í	ń-níkáa+pólŋ-í
	3. Low Loss	ń-níká+koleŋ-í	ń-níká+pólŋ-í
	4. WSR-OP		---> ń-níká+pólŋ-í
	5. HTA	ń-níká+kóleŋ-í	ń-níká+pólŋ-í
	6. WSR-OB		ń-níká+pólŋ-í
	7. WSA		
Noun	2. LTS		
	3. Low Loss		
	4. WSR-OP		
	5. HTA		
	6. WSR-OB		
	7. WSA		
8. C Rules	níká+wóleg-í	níká+wólŋ-í	níká+wólŋ-í
9. Downdrift	níká+wóleg-í		míká+wólŋ-í
Surface	níká+wóleg-í	níká+wólŋ-í	níká+wólŋ-í

The final examples of nominal compounds demonstrate the tonal behavior of nouns which do not undergo the High Tone Spread rule. This would be the case either if the first constituent ends in a high tone (i.e., 3s and 6w), or if it ends in a non-high tone but does not undergo Low Tone Spread by virtue of its membership in class 7w (see 7.2). In both cases, the result is the same: the high tones of the second constituent (due to

the Raising rule) remain unchanged throughout the rest of the derivation and are high on the surface.

first constituent	the white	the old
ɣuluŋ (7s) cobra	gúlu+kólég-í	gúlu+póló-í
kíci (7w) kitchen	kíci+wólég-í	kíci+wóló-í
dɔbá (6w) dumboy	dɔbá+wólég-í	dɔbá+wóló-í

Gloss	the white cobra	the white kitchen
Base	ń-ɣuluŋ+kolen-í	kíci+kolen-í
1. Raising	ń-ɣuluŋ+kóléń-í	kíci+kóléń-í
Suf 2. LTS		
3. Low Loss		
4. WSR-OP		
5. HTA	ń-ɣuluŋ+kóléń-í	kíci+kóléń-í
6. WSR-OB		
7. WSA		
Adj 2. LTS		(-rule 2 see 7.2)
3. Low Loss		
4. WSR-OP		
5. HTA		
6. WSR-OB		
7. WSA		
Noun 2. LTS		
3. Low Loss		
4. WSR-OP		
5. HTA	ń-ɣuluŋ+kóléń-í	
6. WSR-OB		
7. WSA		
8. C Rules	gúlu+kólég-í	kíci+kólég-í
9. Downdrift	gúlu+kólég-í	kíci+kólég-í
Surface	gúlu+kólég-í	kíci+kólég-í

7.6 The Gizima Dialect of Loma

The dialect of Loma reported by Sadler (1952) is, as I have mentioned earlier, from the Gizima area of Liberia. This dialect differs both tonally and lexically from the Gbunde dialect of Loma, described in the preceding sections.

Gbunde	Gizima	Gloss
géde-í	báza-i	head cloth
file-í	fúlé-í	bellows

Such differences are few, and the differences in phonetic detail are slight. The tonal differences, which at first appear to be great, are also slight.

The tonal system of Gizima is summed up by Sadler (1952:137) as follows:

In brief, Loma words are divided into two groups: A and B. The words of A group lower one or more high tones of the following word if it is also of the A group. The words of the B group have no influence on the following word.

Sadler (1952) then provides some examples:

gúlú	(A) 'stick'	tévé	(A) 'cut'	gúlú leve	cut a stick
pélé	(A) 'house'	gwála	(A) 'big'	pélé wala	a big house
bóá	(A) 'knife'	táxa	(A) 'nest'	bóá laxa	a knife sheath
gúlú	(A) 'stick'	pílí	(B) 'throw'	gúlú vílí	throw a stick
		kwélé	(B) 'white'	gúlú wélé	white stick
gálú	(B) 'rope'	tévé	(B) 'cut'	gálú lévé	cut a rope
súó	(B) 'animal'	nówó	(B) 'dirty'	súó nówó	dirty animal

kólú	(B)	'iron'	sóó	(A)	'horse'	kólú zóó	bicycle
gálú	(B)	'rope'	pílí	(B)	'throw'	gálú vílí	throw a rope

On the basis of Sadler's description and from his examples, it can be concluded that Gizima type B words correspond to Gbunde class 2w cvcv words and generally with Southwestern Mande class 2w words. Gizima type A words correspond to Gbunde cvcv words. Below are some correspondences:

Gizima	Gbunde(base)	Bandi(base)	Gloss
gúlú (A)	ɣulu (1w)	wúlú (1w)	tree, stick
pélé (A)	pele (1w)	pélé (1w)	house
bóá (A)	bowa (1w)	bówá (1w)	knife
gálú (B)	ɣáluu (2w)	ɣaluú (2w)	rope
súó (B)	sú.óó (2w)	su.óó (2w)	animal
kólú (B)	kólúu (2w)	koluú (2w)	iron

While the tonal behavior of the Gizima and Gbunde dialects of Loma does differ, this difference is not as great as these two disparate analyses would have it appear. Were Gizima to be analyzed in the same way as Gbunde, it would have only one tone copying rule: High Tone Advancement. The Gizima version of this rule is broader than the corresponding Gbunde version, for it changes all the non-high tones of a given morpheme to high when that morpheme is preceded by a high tone.

High Tone Advancement-Gizima (HTA-Gz)

v --> ʼv / [...ʼv+...__...+...]Nominal

Apparently there are no Gizima equivalents of the rules: Raising, Low Tone Spread, and Low Loss. This is demonstrated below following a presentation of the underlying forms of Gizima nouns and some derivations.

This reanalysis of Gizima represents type B nouns as cvcv which is a slightly different representation from the underlying tonal patterns of the corresponding Gbunde class 2w cvcvv nouns. Type A nouns have a cvcv underlying representation, which is the same as that of their Gbunde cognates.

Gizima(base)	Gbunde(base)	Gloss
ɣulu (A)	ɣulu (1w)	tree
pɛɛ (A)	pɛɛ (1w)	house
boa (A)	bowa (1w)	knife
ɣálú (B)	ɣálúu (2w)	rope
súó (B)	sú.óó (2w)	animal
kólú (B)	kólúu (2w)	iron

With these base forms, the above tonal types can be derived with the use of the High Tone Advancement-Gz rule and the nominal prefix n₂- as follows:

Gloss	big house	white stick
Base	n̂-pɛɛ+gwala	n̂-ɣulu+kwélé
Adj HTA-Gz		
Noun HTA-Gz	n̂-pélé+gwala	n̂-ɣúlú+kwélé
C Rules	pélé+wala	gúlú+wélé
Downdrift		
Surface	pélé+wala	gúlú+wélé

Gloss	dirty animal	throw a rope
Base	ń-súó+nówó	ń-ǵálú+pílí
Adj HTA-Gz	ń-súó+nówó	
Noun HTA-Gz		
C Rules	súó+nówó	ǵálú+vílí
Downdrift		
Surface	súó+nówó	ǵálú+vílí

In this analysis of Gizima, the surface high tones of type A nouns when occurring as the leading noun of the noun phrase are derived by the High Tone Advancement rule operating on the nominal prefix ń₂-. Secondly, instead of saying that A words lower the tones of following A words, this analysis states that A words do not raise the tone of following A (non-high) words because as A words, they do not have high underlying tones. Type B words on the other hand, because they have underlying high tones, do raise the tones of a following A word, due to the effects of the High Tone Advancement rule. Since there is no Low Tone Spread in the Gizima dialect of Loma, A words do not lower the tone of a following B word. Were Low Tone Spread present in Gizima, it would act on the phrase ń-ǵulu-kwélé 'white stick' to incorrectly lower the tones of kwélé producing the non-occurring **ǵúlú+wele.

From the evidence presented in Sadler (1952) it does not appear likely that Gizima has a raising rule. Were a raising rule present in Gizima, it would be expected to raise all type A nouns to type B nouns when acting as either the second constituent of a nominal

compound or any alienable possessive construction. This does not happen as ń-péle+gwala --> péle+wala 'big house' testifies. With a raising rule, one would expect the non-occurring ****péle+wálá**. Also, were a raising rule present in Gizima, one would expect all Gizima compounds to function as B words. This does not always happen as the following evidence from Sadler (1952:142-3) indicates.

kání	(A)	silver
bálá	(B)	bracelet
loo	(A)	to drop
kání+bala	(A)	silver bracelet
kání+loo		drop (a piece of) silver
bálá+loo		drop a bracelet
kání+bala+loo		drop a silver bracelet

The following statement by Sadler(1952) concerning the tonal behavior of the definite suffix demonstrates that Gizima also contains the WSR-OB and WSR-OP rules:

The suffixes, /-gi, -ga, -ya, and -ve/, nearly always follow the tone class of the noun, an A noun lowers the tone of the suffixes; a B noun leaves it unchanged. . . . The suffix /-i/ usually has the tone of the preceding vowel (Sadler 1952:139-40).

Finally, the tonal paraphrases in the following paradigms provide strong evidence of an Optional Weak Suffix Raising rule in Gizima. The paraphrases below can be derived in the same way as the Gbunde possessives given in 7.42.

	foot	dog	
my	kɔwɔ-i	na-gilé-í	
your(sg)	e-wɔwɔ-i	ya-ɣilé-í	
his	kɔwɔ-í	ná-gilé-í	
our ₁	gé-wɔwɔ-í	gá-ɣilé-í	or gá-ɣilé-í
our ₂	dé-wɔwɔ-í	dá-ɣilé-í	gá-ɣilé-í
your(pl)	wo ?	wa ?	
their	té-wɔwɔ-í	tá-ɣilé-í	tá-ɣilé-í

In comparing Gbunde and Gizima tone rules, one can see that Gizima has neither a Low Tone Spread rule nor a Low Loss rule. Furthermore, Gizima also appears to lack a Raising rule. On the basis of arguments presented in 13.1, it is shown that the Gbunde rules of Raising, Low Tone Spread and Low Loss, like all other Gbunde tone rules, are derivable from Proto-Bandi-Loma by a unique process called Tonal Inversion. Because Gbunde tone rules are linked to Proto-Bandi-Loma in such a unique, but consistent way, it is highly unlikely that Raising, Low Tone Spread and Low Loss could have been acquired by the Gbunde dialect through borrowing or independent innovation. If these rules were inherited from Proto-Bandi-Loma through Proto-Loma to the Gbunde dialect of Loma, then the absence of these rules in the Gizima dialect must have been due to a loss of these rules in Gizima.

Chapter 7

Footnotes

1. Despite the fact that Gizima means literally 'hill-top' (gizi 'hill' and ma 'on'), I have resisted the temptation to refer to this dialect in the body of this thesis as "High Loma."
2. Welmers (personal communication) reports hearing a Loma person speaking Kpelle "terribly upside down."
3. Another example of a rule in the process of restructuring may be the Second High Tone Copying rule of Loko (see 5.13).
4. Welmers (personal communication) has pointed out that he did not detect any appreciable downdrift in the Gizima dialect of Loma. It is worth noting here that the downdrift of the Gbunde dialect of Loma never produces the sequence high downstepped-high.
5. The base form of the class 7s morpheme glossed as 'cobra' is problematical. It can be analyzed as taking the n₂- prefix, as I have done, in which case the base form is xulun with the first surface high tone in gulug-i 'the cobra' being the result of the HTA rule and the prefix. If, on the other hand, this morpheme does not take the prefix n₂-, a characteristic of borrowed nouns in classes 6 through 9, then the base form of this morpheme would be gulun. However, such a formulation would also require a statement which weakens the initial consonant to w when this morpheme is preceded by a vowel in order to derive ya-wulug-i 'your cobra' from underlying ya+gulun-i.
6. In Loma, there are a number of suffixes which have been termed "definite." For example, morphemes which imply direction or place generally take the "definite" suffix -ve. The distribution of this suffix, however, can not always be determined by semantic criteria.

Chapter 8

Kpelle Tone

8.0 There are a number of published accounts of the various dialects of Kpelle: Casthelain (1952) and Lassort (1952) in a combined volume provide lengthy accounts of the Kpelle spoken in Guinea where it is known as Guerze. Casthelain claims that he is describing "the dialect spoken by the majority of Guerzes"(Casthelain 1952:16). Both of these descriptions, while covering a large part of the grammar, were frequently lacking in examples and provided only the most meager information on tone. Welmers, in a number of articles (1948, 1950, 1961, 1962, 1964 and 1970), has described in considerable detail a dialect which he calls "Southwestern Kpelle" spoken in Bong County, Liberia. In addition, he makes a number of references to a more northerly dialect spoken in and around the town of Bopolu, also located in Bong County, Liberia. More recently a transformational treatment of Kpelle (Gay and Welmers 1971) has appeared. This grammar focuses heavily on the semantic system of Kpelle. Finally, Westermann (1924) and Westermann and Melzian (1930) have also published works on Kpelle, though these descriptions are of limited value, for as Welmers (1962:69) states, "they unfortunately include some major inaccuracies and omissions."

The following tonal data and analysis are based primarily on Welmers "The phonology of Kpelle" (1962) and "The morphology of Kpelle nominals" (1970). The only real difference is that Welmers's generalizations have been rephrased in transformational terms so that this dialect of Kpelle may be more easily compared with the transformational statements of the tonal characteristics of the other Southwestern Mande languages presented in this thesis.¹

8.1 Rules

The form and ordering of the Southwestern Kpelle tone rules are as follows:

8.11 Lowering

The Kpelle Lowering rule, unlike the lowering rules in the Central SWM languages, is limited exclusively to nominal compounds. But the operation of the Kpelle Lowering rule is the same, for it lowers the underlying tones of the second constituent of nominal compounds.

Lowering

$$\left\{ \begin{matrix} \acute{v} \\ v \end{matrix} \right\} \rightarrow \grave{v} / [(\dots+) _1 \dots ___\dots] \text{ Nominal Compounds}^2$$

(Where $(\dots+) _1$ indicates one or more constituent morphemes)

8.12 Contouring

The Contouring rule converts a morpheme-final mid tone to a short rising tone, when the mid tone is followed by a non-high tone. This rule was not found in Central SWM

because it was absorbed in the restructuring of class 2 nouns (see 11.4).

Contouring

v	-->	v́	/	(cv) (c)___+(c)	[-high]
pele-pu.u	-->	pelée-pu.u		ten paths ³	
path-ten					
seŋ-pu.u		seéŋ-pu.u		ten things	
thing-ten					

Because the final syllable of class 2 nouns sometimes has a surface mid tone (pele 'road') and sometimes a surface high tone (pelée-puu 'ten roads'), this syllable may be said to have a polarizable tone.

8.13 High Tone Displacement (HTD)

High Tone Displacement is described here as a complex of two separate processes: High Tone Copying and High Loss. This separation is useful for the purpose of description and the comparison of the Kpelle tone rules with those of the other Southwestern Mande languages. Synchronically, there is no Kpelle evidence to support the independent existence of these two rules.

High Tone Copying (High Copy)

ṿ --> v́ṿ / [(cv)c(v)v́+(c)___...] Nominal Comp.

High Loss

v́ --> v / [(cv)c(v)___+...] Nominal Compounds
(if HTC applies)

8.14 No Plus Low

Rules 4, 5, and 6 are limited to constructions involving the definite suffix. "No Plus Low" is a very awkward term for a rule which states that the low tone in the sequence high low high becomes a mid tone if the second high belongs to the definite suffix.

No Plus Low (No Low)

$$[+low] \rightarrow [-low] / [+high]_c \left[\begin{array}{c} -high \\ \hline \end{array} \right] - \left[\begin{array}{c} +high \\ +definite \end{array} \right]$$

8.15 Suffix High Agreement

Suffix High Agreement is a rule which states that the feature[high] of the suffix must agree with that of the preceding tone. This rule applies after the No Plus Low rule has raised many low tones to mid.

Suffix High Agreement (SHA)

$$[+high] \rightarrow [-high] / [-high] - \left[\begin{array}{c} \text{suffix} \\ \hline \end{array} \right]$$

8.16 Suffix Deletion

This rule deletes the definite suffix when it is preceded by a nasal consonant. It also transfers the tone of the suffix onto the preceding nasal.

Suffix Deletion (Suf Del)

$$\left[\begin{array}{c} +nasal \\ +cons \end{array} \right] - \left[\begin{array}{c} \cancel{+high} \\ +definite \end{array} \right] \rightarrow \left[\begin{array}{c} \cancel{+high} \\ +nasal \\ +cons \end{array} \right]$$

The tone on the nasal is most noticable when it is non-high.

8.17 Stress

Stress is normally assigned to the first high tone of the nominal in Kpelle, as in the other SWM languages:

péré (1) 'house' kálì (4) 'hoe' konáà (3) 'mortar'

Class 2 nouns have no high tone, and no detectable stress:

pere (2) 'path'

Class 5 nouns are the exception to the above stress statement. They have no high tone and are stressed on the first syllable:

bbèrè (5) 'trousers'

8.18 Consonant Rules (C Rules)

Three consonant rules are responsible for the Kpelle initial consonant alternation: Nasal Absorption, Post-Nasal Voicing and Geminatation.

8.181 The first rule, Nasal Absorption (NAB), merges a nasal with a following liquid, glide, or ɓ.

n-ḃóá-í	$\xrightarrow{\text{NAB}}$	móá-í	the knife ⁴
n-lú.ú-í		nú.ú-í	the ashes
n-yá-í		nyá-í	the water
n-ḡílà-í		ḡílà-í	the dog
n-wúló-í		ḡwúló-í	the oil

8.182 The second rule, Post-Nasal Voicing (PNV), voices obstruents following a nasal prefix.

n-pólù $\xrightarrow{\text{PNV}}$ n-bólù my back

8.183 The Geminatation rule states that a low-toned syllabic nasal assimilates fully to the feature values

of the following consonant producing a geminate consonant. Because Gemination follows Post-Nasal Voicing, the derived geminate consonants are voiced.

\grave{n} -péré-í	$\xrightarrow{\text{PNV}}$	\grave{n} -bééré-í	$\xrightarrow{\text{GEM}}$	b-bééré-í	the house
\grave{n} -pólù		\grave{n} -bólù		b-bólù	his back

These derived geminate consonants are longer in duration than single voiced consonant segments.

8.19 Downdrift

The Downdrift rule in Southwestern Kpelle is restricted to applying utterance-finally and causes the downstep of either a high or mid tone following a low tone.

In utterance final position, high and mid, . . . have slightly lowered allotones after low Thus five levels of pitch can be heard in the following forms, from highest to lowest píí 'jump', 'píí 'throw it', kula 'go out', 'kula 'take it out' and tòlò 'dove' (Welmers 1962:87-8).

I have redescribed these data as follows:⁵

Welmers	píí	Dwyer	píí	jump
	`píí		bbíí	throw it
	kula		kula	go out
	`kula		ggula	take it out
	tòlò		tòlò	dove

The Kpelle Downdrift rule applies only to a sentence-final word which is preceded by a low tone.

Downdrift

$[-low] \rightarrow [+lowered] / [+low] \#(c) _ \dots \#s$

(Where # = word boundary and
where #s = sentence boundary.)

class 1	té.é-ló.ólú	-----→	no change	five chickens
2	kóni-ló.ólú		no change	five stones
3	konáà-ló.ólú		konáà-l'ó.ólú	five mortars
4	kálì-ló.ólú		kálì-l'ó.ólú	five hoes
5	tònò-ló.ólú		tònò-l'ó.ólú	five chisels

Stress, rather than tone, appears to be the factor which determines gemination. Both high-toned and low-toned syllabic nasals occur noun-phrase initially. According to the stress rules (8.17), these high-toned nasals are always stressed while the low-toned nasals are never stressed. It is a general tendency in language for unstressed segments to lose their distinctiveness. In the case of the unstressed Kpelle low-toned nasals \underline{n}_1 -(8.22) and \underline{n}_2 -(8.23), this loss of distinctiveness is virtually complete, for all of the segmental features of these nasals assimilate to the values of the following consonant.

8.1.10 Contour Reduction

The Kpelle Contour Reduction rule applies only to bisyllabic morphemes and not to monosyllabic morphemes. This rule eliminates the internal non-high-toned component of a complex tone. Examples of the operation of the Contour Reduction rule are given in footnote 3 and in 8.5.

Contour Reduction (Cont Red)

$$[-\text{high}] \rightarrow [+ \text{high}] / \left\{ \begin{array}{l} \text{c}\acute{\text{v}}\text{-}\text{c}\grave{\text{v}} \\ \text{cvc}\text{-}\acute{\text{v}} \end{array} \right\} \quad (\acute{\text{v}}\acute{\text{v}} = \acute{\text{v}} \text{ see 2.4})$$

8.2 Base Forms

Kpelle, as has been mentioned before, is the only modern SWM language with three distinct tonal levels.

ká ggè	'you(pl) did it'
ka ggè	'you(pl) do it customarily'
kà ggè	'when you(pl) do it'

8.21 These tonal levels combine to produce the following tone classes:

Class	Tone Pattern	Morpheme	Gloss
1	(c [́] v)c [́] v	pé [́] ré	house
		yá	water
2	(cv)c [́] v	kali	snake
		sɛŋ	thing
3	(cv)c [́] v [́]	konáà	mortar
4	c [́] v [́] c [́] v	kálì	hoe
5	c [́] v [́] c [́] v	bbèrè ⁶	trousers

Welmers (1961) has noted a number of grammatical peculiarities of class 5 nouns, such as the following:

1. Class 5 morphemes must be nouns; there are no verbs in Kpelle with a low low tone sequence.
2. Class 5 morphemes must be alienable nouns; there are no inalienable (familial and corporal) nouns in Kpelle with a low low tone sequence.
3. Sixty-five percent of Kpelle class 5 nouns begin with a strong, voiced consonant which does not weaken, while only fifteen percent of the alienable nouns of the four other tone classes begin

with a strong, immutable initial consonant. Any noun beginning with a strong, immutable consonant is either an obvious or a suspected borrowing.

4. Class 5 morphemes are the morphemes with a stressed low tone.

In order to account for these peculiarities, I have posited a diacritic feature [+foreign] which all class 5 morphemes contain. This feature is also found in some morphemes from other tonal classes as well, such as the following:

<u>dd</u> àlà (4)	dollar	<u>gg</u> èlì (4)	Diana monkey
<u>gg</u> ará (1)	mat	<u>bb</u> èlì (4)	raffia purse
<u>gg</u> oméne (1)	government		

8.22 Kpelle first and third person singular possessive pronouns have two allomorphs as do those of Loko, Bandi, and Lema. In Kpelle, one allomorph is used in alienable possession and one in inalienable (familial and corporal) possession.

	Inalienable	Alienable
1st(sg)	ṇ-	ṇá
3rd(sg)	ṇ ₁ -	ṇwò

Historically, the pronouns ṇá and ṇwò can be shown to be morphemically complex, though this is not apparent in a synchronic analysis of this dialect of Kpelle.

The base representation of the third person singular corporal possessive pronoun ṇ₁- is identical to that of the prefix of prference ṇ₂- (8.3), and it may be that what I have called two morphemes are different manifestations

of the same morpheme. Welmers (1971) treats both \check{n}_1 - and \check{n}_2 - as a low tone without segmental values (see examples 8.19) historically cognate with Northern Mande a 'it'. Others, Bird (1971), Manessy (1965), and Hyman (1973), believe that this morpheme is a low-toned nasal (see also 3.2).

All of the above recognize that the low tone is necessary to account for the downstep of a following high or mid tone in a sentence-final position (8.18).

péré #s	---	péré	a house
n-péré-í #s		b-b'éré-í	the house

I consider these morphemes to be nasal consonants because of their similarity to \acute{n} - '1st singular', a known nasal. All these nasals, \acute{n} -, \check{n}_1 -, and \check{n}_2 -, cause a following voiceless obstruent to become voiced by the Post-Nasal Voicing rule (6.18). All three nasals, \acute{n} -, \check{n}_1 -, and \check{n}_2 - undergo the Nasal Absorption rule (see paradigm for 'mother' 8.4). Only \check{n}_1 - and \check{n}_2 -, however, undergo the Gemination rule. It is because of this last observation that Welmers argues that \check{n}_1 - and \check{n}_2 - could not be nasals, for if \acute{n} -, \check{n}_1 -, and \check{n}_2 - are all nasals, why would only the low-toned nasals cause gemination? However, when it is pointed out that only high-toned nasals are stressed while non-high tones generally are not (8.19), and that unstressed segments generally tend to lose their distinctiveness, the gemination of low-toned nasals (but not high-toned nasals)

is understandable.

The base forms of the remaining pronouns are as follows:

2nd sg.	í
1st pl.	kú
2nd pl.	ká
3rd pl.	ddí

The third person plural possessive pronoun ddí may be morphemically complex, possibly a combination of ṅ- '3rd singular' and tí 'plural' (i.e., ṅ-tí 'it plural').

8.3 The Definite

The definite form is constructed by adding the prefix ṅ₂- and the definite suffix -í to Kpelle alienable nouns. Inalienable nouns in Kpelle never take the definite suffix. The prefix of prference, ṅ₂-, is added to most Kpelle nouns which have previously been mentioned by the speaker.⁷

The definite suffix -í has two tonal variants. It has a high tone when affixed to a noun ending in a high tone and a mid tone following a low tone or a mid tone:

péré	a house	b-béré-í	the house
káli	a hoe	g-gáli-i	the hoe
lexi	a pot	ṅexi-i	the pot
bbèrè	a trousers	bbèrè-i	the trousers

The base tone of the definite suffix must be high, for were it non-high, it would be expected to cause a preceding mid tone to undergo the Contouring rule:

̀n-legi-i ----> **̀n-legii-i

The derivation of the suffix mid tone and the mid tone which frequently precedes it requires two rules: No Plus Low and Suffix High Agreement. No Plus Low applies first and raises a low tone to mid if the low tone is preceded by a high tone and followed by the high-toned definite suffix. Then Suffix High Agreement applies lowering a high-toned definite suffix to mid when preceded by a non-high tone.

Base	<u>No Low</u> →	<u>SHA</u> →	
konáà	no change	no change	a mortar
̀n-konáà-í	̀n-konáà-í	̀n-konáà-í	the mortar
káli	no change	no change	a hoe
̀n-káli-í	̀n-káli-í	̀n-káli-í	the hoe
bèlè	no change	no change	a trousers
̀n-bbèlè-í	no change	̀n-bbèlè-í	the trousers

The definite suffix is deleted following nouns which end in a nasal consonant (8.17). The tone of the definite suffix is not lost, but is transferred onto the preceding nasal. In these examples, the mid tone is marked for clarity.

Base	Gloss	Definite	Gloss
m̩l̩ŋ	rice	̀m̩l̩ŋ	the rice
kélén̩	vehicle	g-gélén̩	the vehicle
kpálàn̩	farm	g-gbálàn̩	the farm
ggònòn̩	gourd	ggònòn̩	the gourd

These forms are derived with the Suffix Deletion rule as follows:

Gloss	the rice	the vehicle	the gourd
Base	̀̀n-m̩l̩ŋ-í	̀̀n-kéleŋ-í	̀̀n-ggònòŋ-í
1. Lowering			
2. Contouring			
3. HTD			
4. No Low			
5. SHA	̀̀n-m̩l̩ŋ-í		̀̀n-ggònòŋ-í
6. Suf Del	̀̀n-m̩l̩ŋ	̀̀n-kéleŋ	̀̀n-ggònòŋ
7. Stress		̀̀n-kéleŋ	̀̀n-ggònòŋ
8. C Rules	m̩l̩ŋ	g-géleŋ	ggònòŋ
9. Downdrift			
10. Cont Red			
Surface	m̩l̩ŋ	g-géleŋ	ggònòŋ

8.4 Possessives

8.41 Inalienable Possessives

Both possessed corporal and familial nouns use the same set of possessive pronouns. The surface tones of these constructions are essentially the same as their lexical tones. The first person singular pronoun is a high -toned nasal prefix: n̩- (8.22). This prefix causes the voicing of a following obstruent (Post-Nasal Voicing 8.182) and the nasalization of a following liquid, glide or implosive ɓ (Nasal Absorption 8.181). The third person singular pronoun, like the first person singular, causes the voicing of a following obstruent and the nasalization of a following liquid, glide, or ɓ. But, in addition,

the third person singular pronoun also results in the gemination of a following obstruent, as does the above-mentioned prefix of prference (see 8.183).

	ear	mother	back	father
my	ḡwólí	nee	mbólu	nḡaḡ
your	í-wólí	í-lee	í-pólù	í-nḡaḡ
his	ḡwólí	nee	b-bólù	nḡaḡ
our	kú-wólí	kú-lee	kú-pólù	kú-nḡaḡ
your	ká-wólí	ká-lee	ká-pólù	ká-nḡaḡ
their	ddí-wólí	ddí-lee	ddí-pólù	ddí-nḡaḡ

8.42 Alienable Possessives

The surface forms of alienable possession do not essentially differ from their underlying representations. With the exception of the first person singular ná and the third person singular nwò, the pronouns used in alienable possession are the same as those used in inalienable possession (8.23).

ná-péré-í	my house	kú-péré-í	our house
í-péré-í	your house	ká-péré-í	your house
nwò-péré-í	his house	ddí-péré-í	their house

8.5 Nominal Compounds

Kpelle compounds involve the Lowering, Contouring and High Tone Displacement rules. High Tone Displacement applies only if the first constituent ends in a high tone and if that high tone is the only high tone in that constituent at the time HTD applies. In the following examples, only the Lowering rule applies (from Welmers

1971:27):

ǵalón	moon	kɔlɔ	paper	ǵalón+kɔlɔ	calendar
kólí	quarter (town)	kálɔn	chief	kólí+kálɔn	quarter chief
ǵalà	God	ta.a	town	ǵalà+tà.à	heaven
kponóò	young bush	kwala	monkey	kponóò+kwàlà	young bush monkey

These compounds are derived as follows:

Gloss	quarter chief	calendar	heaven
Base	kólí+kálɔn	ǵalón+kɔlɔ	ǵalà+ta.a
1. Lowering	kólí+kálɔn	ǵalón+kɔlɔ	ǵalà+tà.à
Surface	kólí+kálɔn	ǵalón+kɔlɔ	ǵalà+tà.à

There are two types of compounds which undergo the High Tone Displacement rule: those in which a first constituent is either a class 2 noun or a monosyllabic, alienable class 1 noun. Below are some examples in which the first constituent is a class 2 noun.

kɔlɔ	paper	lá.á	leaf	kɔlɔ+lá.à	page
kali	snake	pala	sore	kali+pàlà	snake bite
ta.a	town	kálɔn	chief	ta.a+kálɔn	town chief
mi.i	eat	sɛn	thing	mi.i+sɛ̀n	food

The tones of the second constituent are first changed to low by the Lowering rule. Once the tones of the second constituent become low, the Contouring rule can then apply changing the final tone of the first constituent to rising. High Tone Displacement then transfers the high tone

component of the rising tone onto the second constituent. If the second constituent is bisyllabic, the Contour Reduction rule will reduce the derived falling tone to a simple high tone. The following examples show the tonal derivations of nominal compounds in which the first constituent is a class 2 noun.

Gloss	town chief	food
Base	ta.a+kálon	mi.i+sɛn
1. Lowering	ta.a+kàlon	mi.i+sɛn
2. Contouring	ta.aá+kàlon	mi.ií+sɛn
3. HTD	ta.a+káalon	mi.i+séɛn
4. No Low		
5. SHA		
6. Suf Del		
7. Stress		
8. C Rules		
9. Downdrift		
10. Cont Red	ta.a+kálon	
Surface	ta.a+kálon	mi.i+séɛn

Because the Contour Reduction rule does not reduce the falling tones of monosyllabic morphemes, the falling tone created by the High Tone Displacement rule can be observed as such on the surface (e.g., mi.i+séɛn 'food').

Welmers (1971:27) cites one example of a high tone which is also displaced. This is a class 1, monosyllabic high tone.⁸

yá	water
nyá-í	the water
ya+ló.à	water hole (i.e., well)

However, Welmers (1971) also provides examples of monosyllabic nouns which do not undergo High Tone Displacement:

lá	mouth
wó.ó	voice
lá+wò.ò	word

On the basis of the limited number of Kpelle monosyllabic nouns, what seems to be happening is that the High Tone Displacement rule draws a distinction between alienable and inalienable nouns; alienable nouns undergo HTD, inalienable nouns do not. Why this should be remains unexplained.

The patterning of ya+lóà 'well' reflects the application of the High Tone Displacement rule and the need to state the conditions of this rule so that it will apply only if the morpheme-final high tone is the only high in the morpheme.

Gloss	water+hole
Base	yá+ló.á
1. Lowering	yá+lò.à
2. Contouring	
3. HTD	ya+lóò.à
4. No Low	
5. SHA	

- 6. Suf Del
- 7. Stress
- 8. C Rules
- 9. Downdrift
- 10. Cont Red ya+ló.à
- Surface ya+ló.à

Were HTD to apply to compounds in which the first constituent contained more than one high tone, such as kóli + kálòŋ 'quarter chief' the incorrect surface form *kóli + kálòŋ, rather than kóli kálòŋ, would be derived (see above derivation of this compound).

8.6 Summary

Of all the SWM languages, Kpelle appears to be phonologically the most representative of Proto-SWM, and, therefore, the phonology of Kpelle is of great importance. Of particular importance are the Kpelle base forms together with the Lowering, Contouring, High Tone Displacement, Stress, and Contour Reduction rules. The nature of the Lowering rule is particularly well illustrated in Kpelle because of the limited applicability of the High Tone Displacement and the Contouring rules. The development of polarizable tones as a result of the Contouring and Contour Reduction rules is also demonstrated (see 8.12). Finally, the contour-producing nature of the tone-copying rule can be clearly seen in Kpelle nominal compounds where under certain conditions, the falling tone produced by the High Tone Copying rule is not reduced (see 8.5).

Footnotes

Chapter 8

1. Any mistakes are, of course, my own.
2. The prefix ṇ- is not considered to be a constituent of nominal compounds.
3. Lowering does not apply to sequences of Noun Numeral and Noun Corporal Noun. Also pelee pu.u is later reduced to pele pu.u by the Contour Reduction rule (8.1.10).
4. In these examples, the prefix ṇ- carries the meaning 'prereference' and the suffix -i carries the meaning 'definite' (see 8.3).
5. What Welmers has transcribed phonemically as a low tone followed by a voiceless consonant is phonetically a heavily-voiced consonant. The voicing of heavily-voiced consonants lasts longer than that of a normally-voiced segment. This lengthened voicing can be represented phonetically by doubling the voiced consonant. These geminate consonants are derived from N-C_{vd} sequences by the Geminization rule (8.19).
6. The bb of bḅḷe 'trousers' is heavily voiced and indistinguishable from geminate consonants produced by the Geminization rule (8.19).
7. For a more detailed discussion of this morpheme and its distribution, see Welmers (1970) and Gay and Welmers (1971).
8. Subsequent investigation (Welmers, personal communication) has revealed that fa 'cooked rice' also follows this pattern. Apparently because nyi 'tooth' is a corporal noun, it does not undergo Lowering and High Tone Displacement, and, therefore, its surface tone is always high.

Chapter 9

Convergence and Divergence

9.0 This chapter presents a summary of the reasons why some languages have common linguistic properties, including the hypotheses of language change: convergence and divergence. These hypotheses provide the basis for the conclusions presented in the next five chapters about the tonal history of Southwestern Mande. All languages have certain common properties known as linguistic universals. There are others, however, which only are common to some languages and cannot, therefore, be considered universal. A few of these shared non-universal or idiosyncratic properties may be due to accident, though such accidents are rare and unsystematic. When a large number of idiosyncratic similarities are observed, a more systematic explanation is required.

Convergence and divergence are two such explanations. Both are models of language change which state that the similarities among two or more languages can arise as the result of the fact that these languages either shared a period of common development or were subject to the same common pressures. By common development, I mean a period

during which the members of the respective speech communities were in linguistic contact.

Language change in a transformationalist view is expressed as a change in either the inventory of rules or the lexical entries of the grammar of a language. With this view, convergence and divergence can be presented, not as competing processes, but as complementary processes.

9.1 Divergence

Divergence is the process by which two or more languages emerge from a common or proto language. When a given language community becomes divided and the divisions become isolated from each other, divergence is possible. Independent and exclusive innovations, whether of rules or base forms, may then occur in one of these parts and not the other. If the process of independent innovations is repeated often enough, the subdivisions will become so different that each will be recognized as a distinct language.

Divergent development is often illustrated by a family tree diagram such as Figure 1-2 which is repeated here as Figure 9-1 for convenience of reference. In this diagram, height represents time; the bottom of the diagram marks the present, and the top marks a point in the past, when Proto-SWM, the assumed ancestor for all the Southwestern Mande languages, was spoken.¹

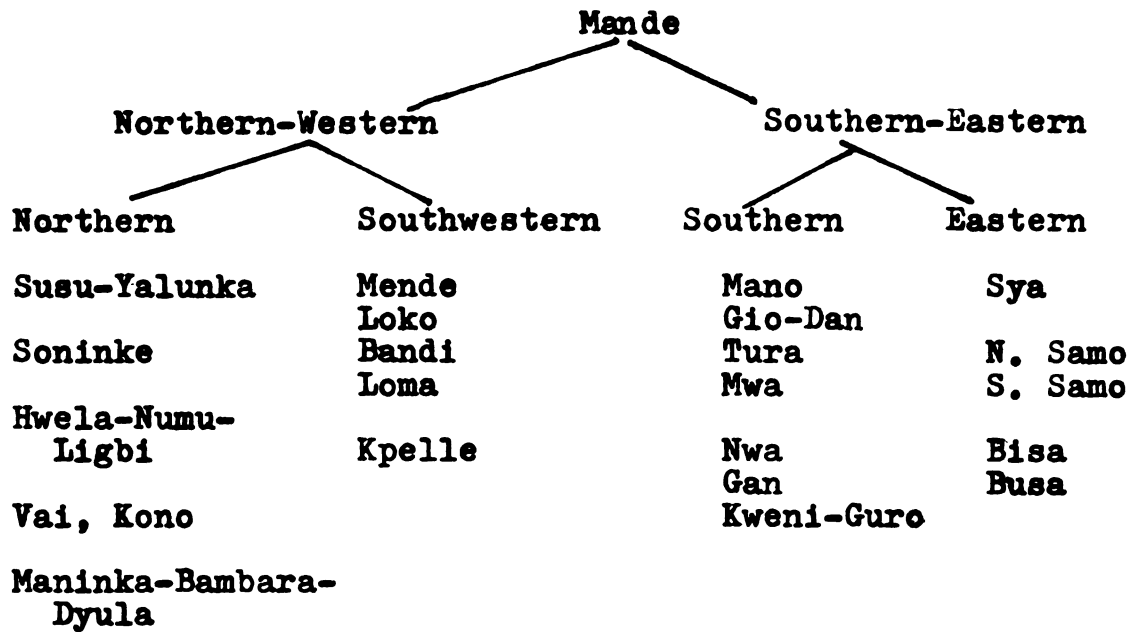


Figure 9-1. The Mande languages (based on Welmers 1958:21)

The branches of this family tree represent the lines of divergent development. The first such development is the separation of Kpelle and Proto-Central SWM. This cleavage implies that all idiosyncratic similarities shared by Kpelle and Proto-Central SWM are also shared by Proto-SWM. Furthermore, all differences between these two languages are assumed to be due to independent and exclusive innovations which have appeared in only one of the languages.

Likewise, all similarities found in the descendants of Proto-Central SWM are assumed to be present in Proto-Central SWM, and all differences between these descendants have occurred since the division of Proto-Central SWM into its descendant languages.

For example, the form of the second person singular possessive pronoun is bi in Mende and Loko and i or e in the other SWM languages. This fact is most easily

explained by the morphological replacement in Proto-Northern SWM of the second person singular possessive pronoun *i by *bi².

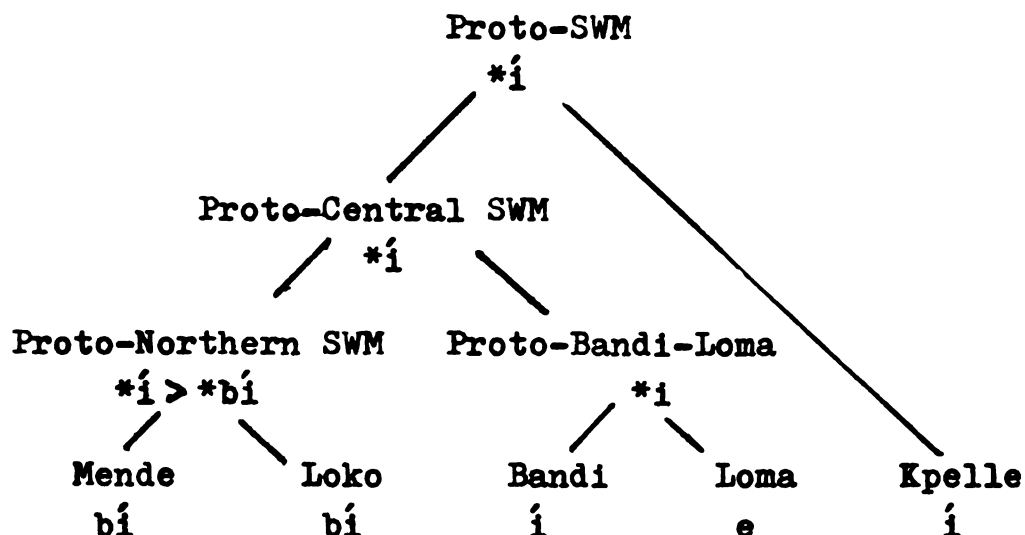


Figure 9-2. The development of SWM second person singular

In Figure 9-2, the change from *i to *bi should be understood as having taken place prior to the establishment of Proto-Northern SWM in a language technically called Pre-Northern SWM. Having noted this technicality, the term "pre" will not be used in this context and in succeeding chapters.

Any language prefixed by the term "Proto" is hypothetical and unattested. In Southwestern Mande, I have proposed four such languages: Proto-SWM, Proto-Central SWM, Proto-Northern SWM, and Proto-Bandi-Loma.

The validity of Proto-SWM is supposed from the observation that all of the SWM languages are more similar to each other than to the other languages of the world. The

validity of the other hypothetical SWM languages is justified by the independent innovations which can be posited for each of these languages; the more independent innovations, the greater the validity of the hypothetical languages. Most of the justifications given here have to do with the development of tone, simply because this thesis is primarily concerned with tone, and tonal data are more readily available. Nevertheless, other syntactic and phonological developments which are beyond the scope of this thesis also support the validity of these hypothetical proto-languages.

The independent and exclusive innovations which support the existence of the proposed SWM hypothetical languages are as follows:

1. Proto-Central SWM

- a) The restructuring of class 2 nouns from *(cv)cv to *(cv)cvv (see 11.2).
- b) The loss of the feature value [+low] (see 11.5).

2. Proto-Northern SWM

- a) The restructuring of *í to *bí (see Figure (9.2)).
- b) The restructuring of *ń to nyáa 'my' (see chapter 14).
- c) The development of the his₂ paraphrase (see 10.1).

3. Proto-Bandi Loma

- a) The restructuring of morpheme-final falling tones to simple high tones (see 10.3).
- b) The innovation of the Low Tone Advancement rule (see 10.5).

Having established the existence of a particular hypothetical language, the question arises: what is the grammar of this language like? The form of the rules and base forms of these hypothetical languages can not be established with absolute accuracy, but one can make some educated guesses, based on the ways in which languages have been observed to develop.

Rule developments are summarized by the following, idealized "life cycle" of a rule. This idealization, based on numerous clear cases of individual rule changes, states only what is likely, not what must be.

A rule first appears in a language as a result of either borrowing or independent innovation. Generally, a new rule is added near the end, if not at the end, of the ordered list of rules in the language.³ High Tone Advancement in Gbunde (7.6) is such an example.

As time passes, the rule tends to broaden in range of application with the result that more phonological sequences are processed by the rule. A rule broadens through a change in its structural description. The High Tone Displacement of Kpelle and Proto-SWM broadened in Proto-Central SWM to include alienable possessive and nominal compounds in its structural description.

Kiparsky (1968) and others have demonstrated that most of these restructurings can be characterized as simplifications, though there are some examples of rule broadening in

SWM where simplification is not immediately apparent. For example, in Central SWM the above mentioned High Tone Displacement rule broadened to include one kind of possession (alienable possession) but not others (familial and corporal possession). It is not clear that the inclusion of alienable possession in the structural description of the High Tone Displacement rule resulted in a simpler rule. High Tone Displacement later broadened in Proto-Bandi-Loma to include all possessives and this development does appear to be a simplification. Thus, while the trend of broadening may ultimately result in a simplification, some of the intermediate stages are not obvious simplifications.

A set of rules may also broaden by reordering to produce a feeding order or to destroy a bleeding order. A feeding order is a sequence of two rules where the output of the first provides additional input for (i.e., feeds) the second. A feeding order is regarded as less highly marked than a non-feeding order and, as such, is considered to be the simpler ordering.

A bleeding order is a sequence of two rules, where the first diverts (i.e., bleeds) some of the potential input for the second. A bleeding order is said to be more highly marked, and, consequently, a change in a rule ordering which destroys a bleeding order would be simpler.

The development of SWM consonants provides several examples of the reordering of phonological rules. The development of Loma initial voiced geminate consonants from

prenasalized consonants (Loma: *dágág-i* from Proto-Bandi-Loma *ndábáng-í*) resulted from the reordering of the Nasal Expansion rule and the Geminization rule in Loma (see 3.2).

Thus, an established rule changes through time in the direction of broadening, a development which can usually be characterized as simplification. The ultimate in rule simplification and the final stage of the life cycle of a rule is the loss of the rule. When a rule is lost, it may disappear without a trace, as exemplified by the loss of the Raising rule in the Gizima dialect of Loma. Or, it may be lost with a compensatory restructuring of certain base forms.

Compensatory restructuring usually involves the absorption of the "lost" rule (old base + rule = new base - rule). Such is the case of the restructuring of class 2 nouns in Central SWM, which, in effect, absorbed the Contouring rule (see 11.2).

The life cycle of a rule provides a basis for reconstructing rules for hypothetical languages. In comparing a set of related rules, one should bear in mind that the narrowest or least simple form of the rule is quite likely the most representative of its original form. More

accurately, the composite of the narrowest and most complex components of the various rules would be the most representative of the historical antecedent form of these rules.⁴

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For example, the Kpelle Lowering rule applies only to nominal compounds, while the Central SWM versions of the rule

also apply to possessed alienable nouns. Because the Kpelle form of the rule is the narrowest, it is presumably the most representative of the Lowering rule in Proto-SWM (see 10.1).

Correspondingly, morphemes also have a "life-cycle" which underlies their reconstructions. The cycle begins with the addition of the morpheme to the lexicon. If a morpheme has been borrowed, as opposed to being coined within the language, on its addition, it usually functions outside the phonological and syntactic system of the language, giving it an asymmetrical appearance. Class 5 morphemes in SWM still have this appearance. In Kpelle, for example, they can only be nouns, and throughout SWM this class contains a large percentage of morphemes which do not mutate. The longer a morpheme remains in the language, the less "foreign" it becomes; though the rate at which morphemes become nativized varies from language to language. In Mende and Loko, for example, newly acquired morphemes show a greater resistance to nativization than those in Bandi. Loko kofi 'coffee' does not undergo consonant weakening, while Bandi kphi 'coffee' does.

This nativization process may involve the loss of restrictions concerning existing rules, as in the case of Bandi consonant weakening, or it may result from a new rule being added to the language and applying to all lexical items possessed by the language at that point. The fronting of

certain vowels before the definite suffix in Mende is one such example (see Spears 1968a).

When a morpheme changes, its base form restructures. Some restructurings are simplifications, as is the loss of Mende morpheme-final nasals (see 14.3). Others are not simplifications, and are the result of a rule loss, such as the restructuring of class 2 nouns in Proto-Central SWM, which involved the absorption of the Proto-SWM Contouring rule (see 10.2).

Given these assumptions about the diachronic development of the base forms, it is possible to make some educated guesses about the shape of base forms of unattested languages. And when this information is put together with the assumptions about the diachronic development of rules, much can be determined about the divergent development of a set of related languages.

9.2 Convergence

Languages may also have common properties because of convergence, a process by which two or more languages become more similar through time, through the acquisition of common rules and base forms. Convergence may result from independent innovation of the same phonological rule due to common phonological pressure or through the acquisition of a rule or a base forms as the result of the process known as linguistic diffusion. Rules and base forms have been observed to pass from one language to the next in a way which is analogous to the diffusion of waves from their source of

emission. Accordingly, this phenomenon has been entitled "The Wave Theory."

Convergence, a result of this wave-like spreading of linguistic features, can produce a Sprachbund, a geographical area in which a group of languages, while not closely related by divergence, shares a number of common idiosyncratic linguistic features. When rules spread, they broaden and simplify in the same way as rules which change through time.

Thus, by comparing the degree of complexity of a set of rules known to have spread by diffusion, one can determine, with a fair degree of accuracy, the original form and the direction of spread of the rule.

Convergence within Southwestern Mande has taken place between Bandi and Loko. These developments include the borrowing of the Second High Tone Copying rule and of the y to h rule by Loko (see 10.4).

Loko is currently isolated from the main body of the SWM languages and, as such, is not in a position to be influenced by Bandi. Yet, quite likely, in the not too distant past, Loko was spoken in an area geographically adjacent to Bandi (see Hirst 1958 and Abraham 1969). Since acquiring the rules mentioned above, Loko has left the main cluster of the SWM languages and moved westward to its present location.

Both convergence and divergence contribute to the history of the development of a language, and in order to get an

accurate understanding of this history, it is necessary to establish which developments were due to convergence and which were due to divergence. Although such a determination is not always possible, there are a number of useful clues. Convergence can be established as the reason for two or more languages having common properties if the rules and base forms under consideration can be established as borrowings, or if they are in some way asymmetrical. The morphemes kofi 'coffee', dala 'dollar' and moto 'motor' (i.e., car) are quite likely borrowings since they can be traced to words which were in use in English prior to the period of English-SWM contact. Secondly, these morphemes represent cultural innovations likely to have been introduced into this area by speakers of English.

Base forms are asymmetrical when they do not undergo rules and processes which other morphemes in the language do. Welmers (1958) used asymmetry to show that Kpelle class 5 nouns must be regarded as borrowings (see 8.2). Common rules and base forms which are due to convergence can also be detected if their development is not consistent with the normal divergent development of rules and base forms in the languages involved. The distribution of Second High Tone Copying provides an example: Second High Tone Copying appears in Proto-Bandi-Loma, Bandi, the Gbunde dialect of Loma (as Low Tone Spread), and Loko, but not in Mende or Kpelle (see Figure 10.6). While it is possible that this rule was present in Mende and subsequently lost,

there is no supporting evidence. In fact, what evidence there is (fossilized compounds) suggests that Second High Tone Copying was never present in Mende. If this rule was never present in Mende, then the development of 2nd HTC is not consistent with normal SWM divergent development and, therefore, involves convergence (for further discussion, see 10.4).

The best proof of divergent development of a linguistic feature is the demonstration that its development is consistent with a number of other developments regarded as divergent.

The following five chapters deal with the convergent and divergent developments of the tonal systems of Southwestern Mende.

Footnotes

Chapter 9

1. The time of the separation of Proto-Southwestern Mande from Proto-Northern Mande has been estimated by Welmers (1958) on the basis of glottochronology to have taken place during the first century A.D. The homogeneity within Southwestern Mande is so great as to suggest to me that the divergence of Southwestern Mande began relatively recently, within say the last six or seven hundred years. The questions when and where this divergence took place provide an interesting problem for the historically oriented linguist. This problem could be solved by putting together the purely linguistic facts of SWM with the numerous oral histories of the peoples of Sierra Leone, Liberia and Guinea, and with what is already known about the general history of the area.
2. A single asterisk is used to mark reconstructed, unattested SWM morphemes. In contrast, a double asterisk marks a grammatical or phonological sequence not permitted by a particular grammar. Also, the replacement of *ɪ by *bi has been assumed to be a morphological one, despite the phonetic similarity of these two morphemes, because of the lack of evidence to support a phonological change from *ɪ to *bi in these languages.
3. The only exceptions to this statement in SWM concern the Downdrift and Contour Reduction rules, which always appear at the end of the list of SWM rules. This may be because these two rules are output constraints.
4. To say that rules tend to simplify is not to say that phonological change always results in simpler grammars, or even simpler rules. An example of the development of a more complex rule from a simpler rule is Kpelle Downdrift (10.7). Other cases of more complex rule development arise through borrowing. In Bandi, for example, newly acquired class 6 and 7 nouns do not undergo any of the tone copying rules. In Loko and Mende, newly acquired morphemes usually resisted initial consonant mutation. This results in a situation where some morphemes undergo consonant mutation, and some do not. Because these borrowings result in exceptions, the grammar is necessarily more complex.

Chapter 10

The Diachronic Development of Southwestern Mande Tone Rules

10.0 Figure 10-1 contains a summary of the developments of the Southwestern Mande nominal tone rules. This figure includes four hypothetical, unattested stages of SWM: Proto-SWM, Proto-Central SWM, Proto-Northern SWM and Proto-Bandi-Loma (PBL), as well as the five SWM languages.¹

Under each language of Figure 10-1, both modern and hypothetical, only those rules which differ from their antecedents are listed in order to emphasize the tonal innovations which have taken place in SWM. The number preceding each rule marks the relative ordering of the rule in each language. This numerical prefix also identifies cognate rules so that all cognate rules have the same numerical prefix. Likewise, the letter in parenthesis following each rule indicates the language where the rule or rule variation is supposed to have originated. Thus, Lowering (P), the Proto-SWM Lowering rule, underwent a revision in Proto-Central SWM to become Lowering (C), and so on. The rules of these hypothetical languages were reconstructed on the basis of the assumptions given in chapter 9 concerning the origins of similarities between languages and the nature of language change.

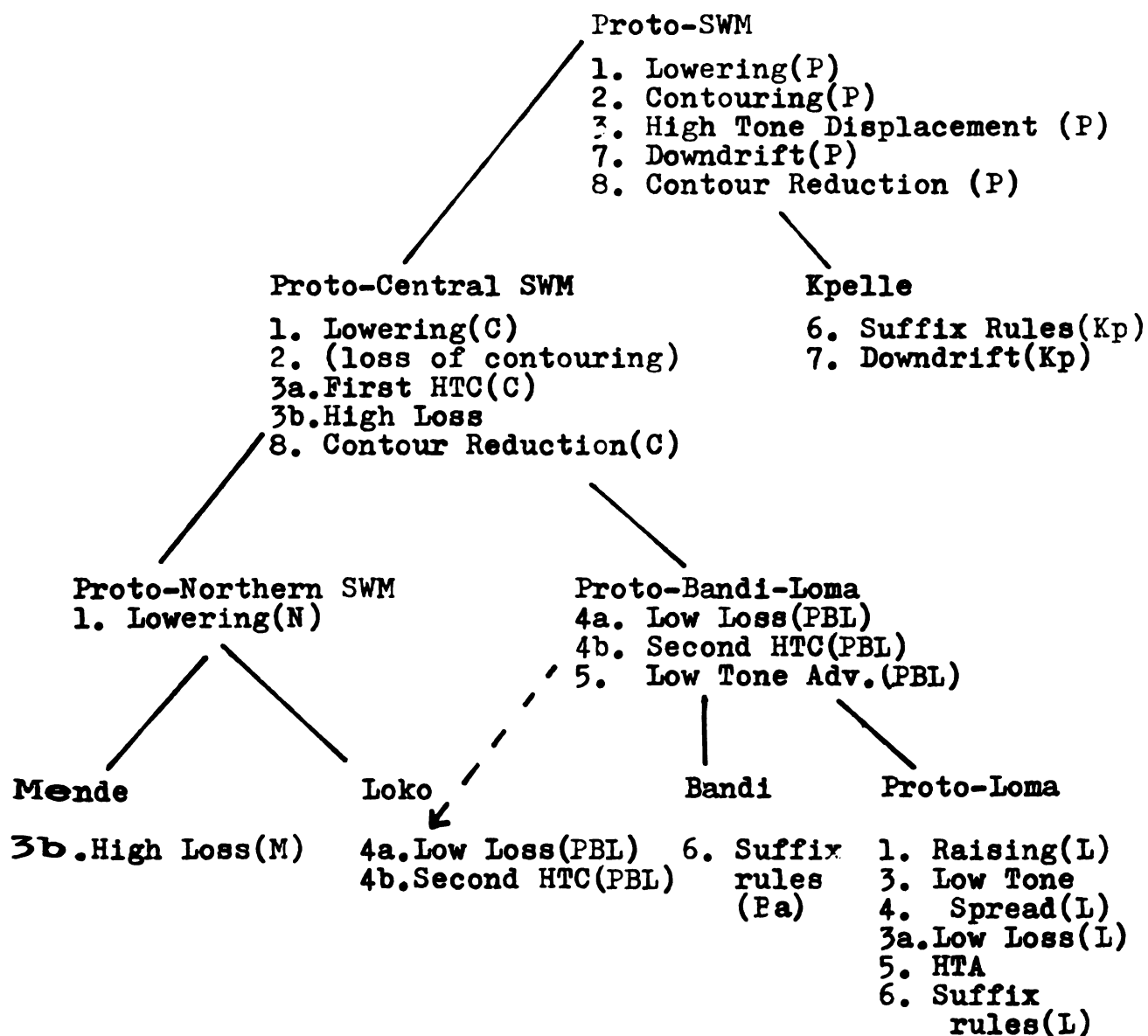


Figure 10-1: Proto-SWM rule development.

The rule-by-rule discussion of the SWM tone rules follows the rule numbering of the preceding chart. The history of each SWM rule is reconstructed by comparing the relative complexity of its various manifestations in the SWM languages. Where possible, these rules are compared with their counterparts in Bambara, a Northern Mande language, thus permitting some insights into the tonal developments of both branches of Northern-Western Mande.

The tonal development of Loma rules, only briefly mentioned here, is discussed fully in chapter 13.

10.1 Lowering

Tone-Lowering rules appear in both branches of Northern-Western Mande. Lowering in Bambara is part of a more general process called Tone rule 1 (Bird 1966: 139).

Tone rule 1 states that any word following the initial noun of the noun phrase loses its stem tone if it is not immediately preceding the article. This rule is in effect constrained to operate only on noun compounds and noun plus adjunctive adjective constructions.²

The grammatical environments of the Bambara Tone rule 1 are identical to those of the modern Kpelle lowering rule and most likely to those of the Proto-SWM lowering rule as well.

Lowering (P)

$$\left\{ \begin{array}{c} \acute{v} \\ v \end{array} \right\} \rightarrow \grave{v} / [(\dots)_1 \dots _\dots] \text{ Nominal Compounds}$$

An additional grammatical environment, alienable possession, appears in the structural description of the Central SWM lowering rules. While this development can be characterized as a broadening, it is not an obvious simplification.

Lowering (C)

$\acute{v} \rightarrow v / [(\dots)_1 \dots _\dots]$ Nominal Compounds
Alienable Poss.

Lowering (C) further broadened in Northern SWM to include the his₂ paraphrase of familial possessives (see 4.1 and 5.1). Here, then, is another example of a broadening that is not an obvious simplification.

Lowering (N)

$\acute{v} \rightarrow v / [(\dots)_1 \dots _\dots]$ Nominal Compounds
Alienable Poss.
His₂

With the effects of Tone Inversion, the Lowering rule became the Raising rule in Loma. This rule was lost in the Gizima dialect of Loma (see 7.6). Figure 10-2 summarizes the development of the Lowering rule in SWM.

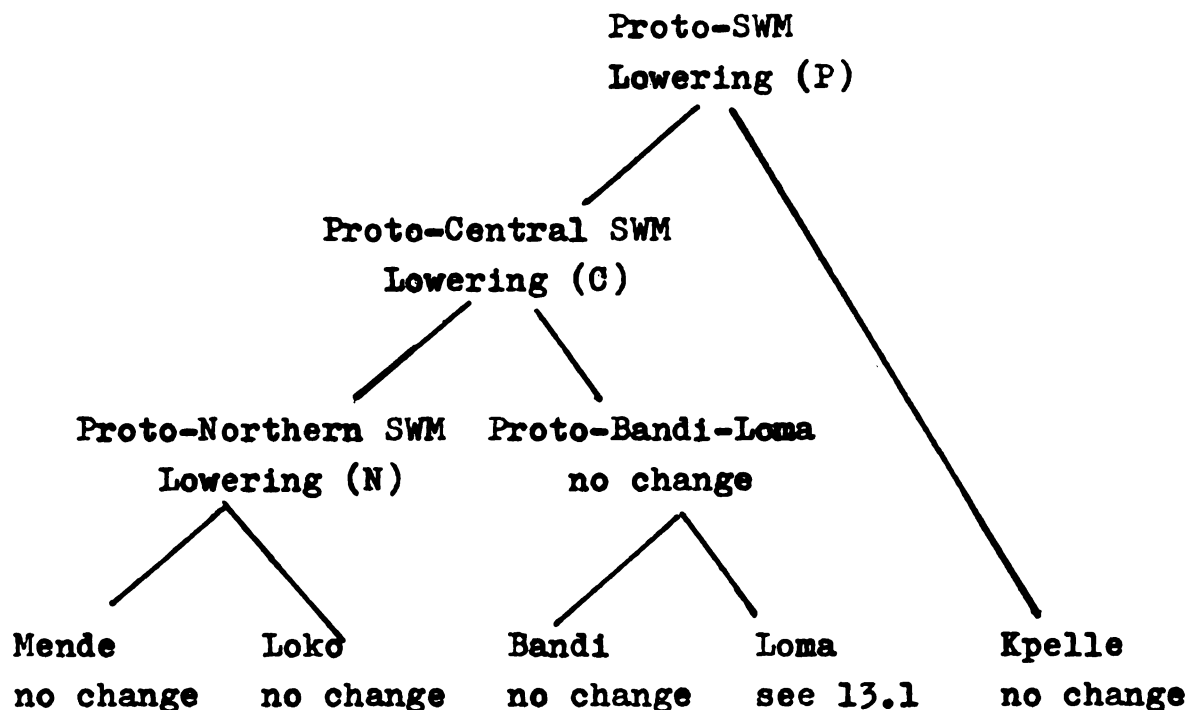


Figure 10-2: The development of the SWM Lowering rule.

Because the Lowering rule serves to mark nominal compounds in Proto-SWM and nominal compounds as well as alienable possessives in Central SWM, it serves many of the functions of an associative particle. This particle, which we may call **ASC*, is located between the two previously identified constituents of nominal compounds (e.g., Noun₁-Noun₂)³. Suppose that earlier in the history of Mande there had been such an associative particle, and that some time later in the history of Mande, this particle was deleted. Had this particle been lost without a trace, nominal compounds would have become indistinguishable from sequences of two nouns. Is it possible that when **ASC* was lost in Mande, the lowering of the tones of the morpheme following **ASC* arose in order to preserve this distinction, and that the Lowering rule contains the environment previously

occupied by *ASC? Lowering also occurs in the Mende and Loko paraphrase of familial possessives. Here too, it is possible that the deletion of the pronoun was followed by compensatory lowering.

It is also possible that *ASC had a non-high tone and provided the source tone for a low-tone copying rule which caused the lowering of the tones of the second constituent of these nominal compounds. Because of this rule, *ASC was no longer necessary to distinguish nominal compounds from other sequences of two nouns and was lost.

10.2 Contouring

The Contouring rule of SWM is part of the process described by the Bambara "low rise before low" rule (Bird 1966: 142). In Bambara, a morpheme with a final low tone, when followed by another low tone, develops a high tone: monosyllabic non-high-tonal morphemes, ov, become rising, ov^h, and bisyllabic non-high-toned morphemes, ovov, become low-high, ovov^h. This situation also appears in Kpelle, but here it is treated as two processes: the Contouring rule followed by the Contour Reduction rule. Since contouring rules appear in both branches of Northern-Western Mande, a Contouring rule must also have been present in Proto-Northern-Western Mande.

Contouring (P)⁴

$$v \rightarrow v^h / (cv)_o cv_ (c)[-high]$$

The structural description of this rule broadened in Central SWM to include all occurrences of class 2, (ov)ov

nouns, no matter what the following tone.

Contouring (C)

$v \quad \text{-----} \rightarrow \quad vv \quad / \quad (ov)_o cv_ +$

This broadening, a simplification, can be equally expressed as a restructuring of class 2 nouns from (ov)cv to (ov)cv', a development which absorbed the effect of the Contouring rule. The restructuring of class 2 nouns is also discussed in 11.4. Figure 10-3 summarizes the development of the SWM Contouring rule.

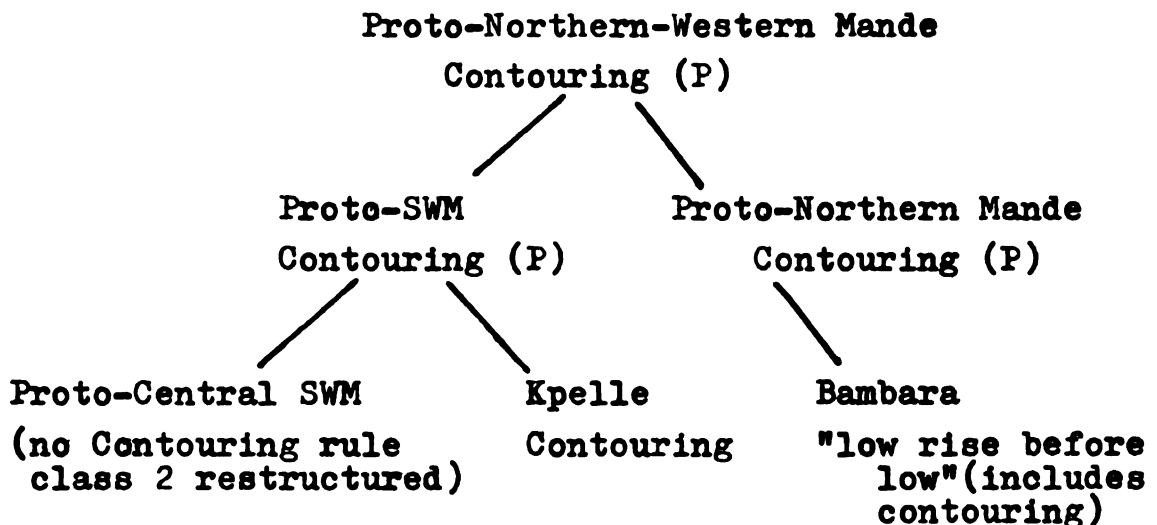


Figure 10-3: The development of the SWM Contouring rule.

10.3 High Tone Displacement

High Tone Displacement appears as a cluster of two separate processes: First High Tone Copying⁵ and the High Toss rule. While this division simplifies the description of the High Tone Displacement process in SWM, only in Mende do these rules occur as separate processes, each rule having its own distinct structural description. Elsewhere

in SWM, the High Loss rule or its cognate applies if and only if First High Tone Copying does.

Because the Kpelle version of this rule has the narrowest structural description of all the SWM High Tone Displacement rules, it most closely represents the Proto-SWM form of the rule.

First High Tone Copying (P)

$v \rightarrow \acute{v}v / [(cv)_o(cv)\acute{v}+(c)_\dots]$ Nominal Compounds

High Loss (P)

$\acute{v} \rightarrow v / [(cv)_o(cv)__+ \dots]$ Nominal Compounds

Paralleling the Lowering rule, the structural description of the First High Tone Copying rule broadened in Central SWM to include alienable possessives. Secondly, and more clearly a simplification, the structural description of the Central SWM High Tone Copying rule broadened to include the copying of all morpheme-final high tones under the appropriate conditions. Also in two of the Central SWM languages, Loko and Bandi, First High Tone Copying has to be stated so that it would apply vacuously and copy a high tone onto a high tone. Because this modification is found in both branches of Central SWM, it has been assumed that it was present in Proto-Central SWM. There is no way of telling whether this rule also applies vacuously in Kpelle and Proto-SWM.

First High Tone Copying (C)

$[\ast high] \rightarrow [+high][\ast high] / [\dots[+high] + (c)_\dots]$

Nom. Comp. & Alien. Poss.

The Central SWM High Loss rule replaced the Proto-SWM High Loss rule. This replacement involved the expanded use of n_2 - in Central SWM and the restructuring of alienable class 1, $q\acute{v}$, morphemes to class 2, $qv\acute{v}$ (see 11.4). With these class 1 nouns restructured, the High Loss rule can be stated more simply as a process which lowers the final component of a morpheme-final short rising tone if 1st HTC applies.

High Loss (C)

\acute{v} ----> v [... v __+....] Nominal Compounds
(if 1st HTC has applied)

The structural description of the Proto-Bandi-Loma First High Tone Copying rule broadened to include all types of possessives.

First High Tone Copying (Proto-Bandi-Loma)

[α high] -> [+high][α high] / [... [+high] + (o)___...]
Nominal Compounds
All Possessives

(The High Loss rule remains unchanged in Proto-Bandi-Loma.)

The development of the High Tone Displacement rule shows that, as it changes through time, its structural description broadens. It applies originally to nominal compounds (Proto-SWM), then to nominal compounds and alienable possessives (Central SWM) and, finally, to nominal compounds and all types of possessives (Proto-Bandi-Loma). While the

direction of change can clearly be seen as a broadening process, and its ultimate result is a simplification, the intermediate stage, while a broadening, is not an obvious simplification.

Curiously, the Loko version of High Tone Displacement seems to represent a stage of development in which the broadening process is not fully complete. The rule applies obligatorily to nominal compounds and alienable possessives and optionally to inalienable possessives.

First High Tone Copying (Lk)

$v \rightarrow \acute{v}v / [...\acute{v}+(c)__\dots]$

Nominal Compounds	{oblig.}
Alien. Possessives	{oblig.}
Corporal Poss.	{opt.}
Familial Poss.	{opt.}

(The High Loss rule in Loko is the same as in Proto-Central SWM)

The final development of the process which began as High Tone Displacement (P) involves the complete disassociation of the First High Tone Copying rule from the High Loss rule. In Mende, the High Loss rule reduces any sequence of ovv[́]to[́]v to ov[́]to[́]v and not just those sequences to which First High Tone Copying has applied. This development is an obvious simplification. In 11.4 it is suggested that the Mende revision of the High Loss rule must have appeared after the loss of Mende morpheme-final nasals. Figure 10-4 summarizes the development of the High Tone Displacement rule.

High Loss (Me)

$\acute{v} \rightarrow v / v_ (c) \acute{v}$

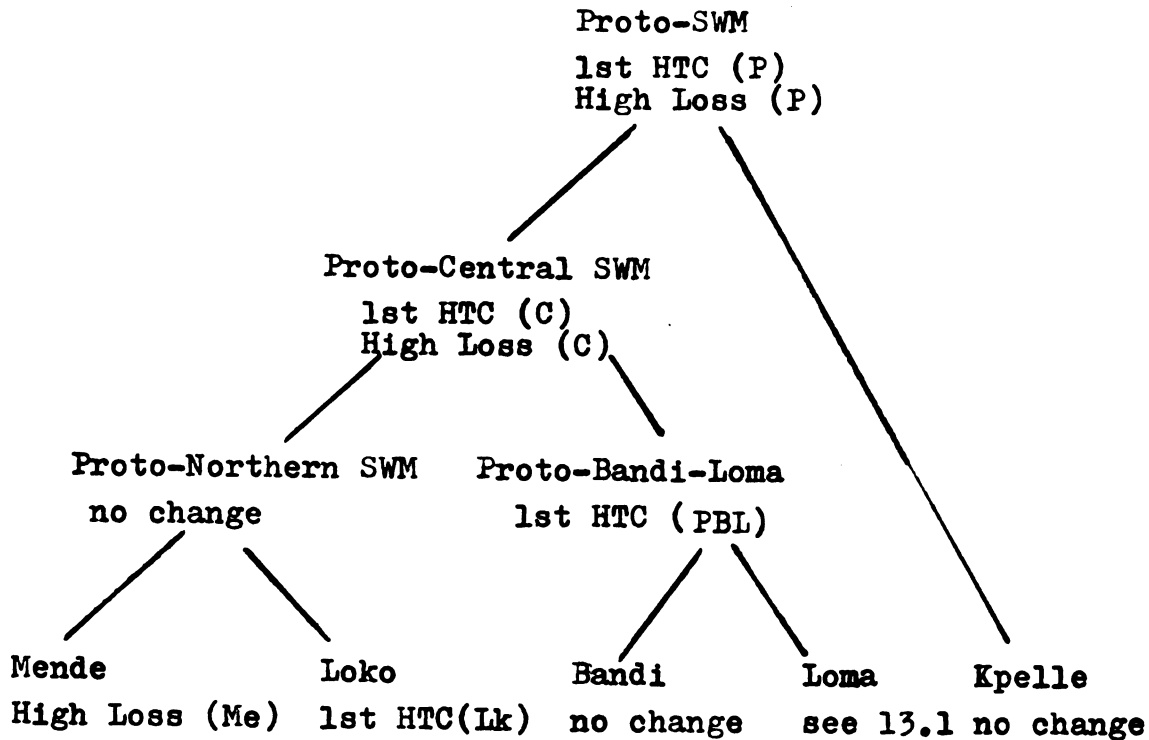


Figure 10-4: The development of the SWM High Tone Displacement rule.

10.4 High Tone Extension

Like High Tone Displacement (10.3), High Tone Extension can be broken down into two sub-rules, Low Loss followed by Second High Tone Copying. The Low Loss rule converts a short falling tone when followed by a non-high tone into a simple high tone and in so doing provides additional input to the Second High Tone Copying rule.

Low Loss (BL)

$v \rightarrow \acute{v} / \acute{v}_ (c) v$ (where $\acute{v}\acute{v} = \acute{v}$ see 2.3)

Examples of the Second High Tone Copying rules in SWM are given below following a discussion of the peculiar distribution of this rule in SWM. Second High Tone Copying is found neither in Kpelle nor in Mende. That is, it is found in all of the Central SWM languages but Mende. To assume that the rule was never present in Mende further implies that the rule was not present in Northern SWM, Central SWM and Proto-SWM, the languages which dominate Mende (see Figure 10-6). If none of these hypothetical languages had this rule, then its presence in Loko and Proto-Bandi-Loma and not Mende can not be due to divergent development. Either Loko borrowed the rule from Bandi (or Proto-Bandi-Loma) or vice-versa.

Despite the current geographical isolation of Loko from the main body of the SWM languages, the historical evidence shows that, at one time, Loko was spoken in an area geographically adjacent to Bandi (Hirst 1958). This fact adds more plausability to the borrowing hypothesis. In addition to the historical evidence, the distribution of a rule converting y to h supports the borrowing hypothesis. The y to h rule occurs in Loko, one dialect of Bandi, and the eastern dialects of Kpelle. The various reflexes of Proto-SWM *ɔ́ɔ́ 'day' demonstrate the effects of the rule.

	Base	the day	your day
Proto-SWM	*fóló	*m-fóló-í	*í+fóló-í
Kpelle (Eastern)	fóló	v-voló-í	i+h ^w óló-í
Kpelle (S. Western)	fóló	v-vóló-í	í+fóló-í
Loma	folo	fóló-í	e+voló-í
Bandi (a)	fóló	foló-í	í+vóló-í
Bandi (b)	fóló	foló-í	í+hóló-í
Mende	fól.ó	fó.é-í	bí+vó.e-í
Loko	fóló	fóló-í	bí+hólo-í

Because the distribution of the y to h rule is inconsistent with the established divergent developments of Southwestern Mande, the presence of the rule in Loko and Bandi and not Mende is most likely due to borrowing. And if borrowing between Loko and Bandi is the explanation of the peculiar distribution of the y to h rule, the peculiar distribution of the Second High Tone Copying in SWM may also be due to borrowing between Bandi and Loko.

The distribution and the form of class 4 nouns in SWM provides further support for the hypothesis that the presence of Second High Tone Copying in Loko and Bandi, but not Mende, resulted from rule borrowing. Both restructured class 4 nouns and the Second High Tone Copying rule appear in Loko, Bandi, Proto-Bandi-Loma, and Loma. The original form of class 4 nouns occurs in Kpelle and Mende where the Second High Tone Copying rule is absent. The restructuring of class 4 nouns from óvov to óvóv correlates very closely

with the Second High Tone Copying rule, which is not too surprising; for were this rule to apply to the lexical formatives o'vov it would derive the restructured o'vovv tonal pattern. If Second High Tone Copying caused the restructuring of class 4 nouns, then by explaining the distribution of the rule, the distribution of restructured class 4 nouns is also explained.

This relationship also provides an argument against Second High Tone Copying ever having appeared in Mende. Had Mende originally had this rule, it would most likely have restructured Mende class 4 nouns to ****o'vovv**. Following the loss of the rule, the restructuring would be expected to remain, as in the Gizima dialect of Loma. Because Mende class 4 nouns do not show any sign of restructuring, it can be concluded that Mende had a Second High Tone Copying rule.

Secondly, had this rule occurred in Mende, it might have appeared in fossilized compounds such as the word for 'aunt', nietwúlo⁷. Had 2nd HTC been applied to this compound, the non-occurring ****nietwúlóo** would have occurred in Mende. Because Mende contains no evidence of a Second High Tone Copying rule, either in the restructuring of class 4 nouns or in fossilized compounds, the presence of this rule in Bandi and Loko and not Mende must have resulted from borrowing.

Both the Bandi and the Proto-Bandi-Loma version of this rule apply morpheme-internally.

Second High Tone Copying (BL)

$$v \quad \text{---}\rightarrow \quad \acute{v}v \quad / \quad [+(cv)_1 (c\acute{v})_1 (c) \text{---}\dots] \text{ Nom. Comp.}$$

The Bandi version also includes alienable possessives in its structural description, most certainly a recent development (see 6.4).

Second High Tone Copying (Ba)

$$v \quad \text{----}\rightarrow \quad \acute{v}v \quad / \quad [+(cv)_1 (c\acute{v})_1 (c) \text{---}\dots] \text{ Nom. Comp.}$$

Alien. Poss.

Second High Tone Copying (Ba) marks the third rule which originally applied exclusively to nominal compounds and which broadened to include alienable possessives (Lowering and High Tone Displacement being the others).

Both the Proto-Bandi-Loma and Bandi Second High Tone Copying rules have more restrictions than the Loko equivalent, the latter also applying across morpheme boundaries.

Second High Tone Copying (Lk)

$$v \quad \text{----}\rightarrow \quad \acute{v}v \quad [\dots v(c) \text{---}\dots] \text{ Nominal Compounds}$$

According to our assumption about rules simplifying as they spread, it can be concluded that Loko acquired the rule from Proto-Bandi-Loma, rather than the other way around. Figure 10-5 summarizes the development of the Second High Tone Copying rule in SWM.

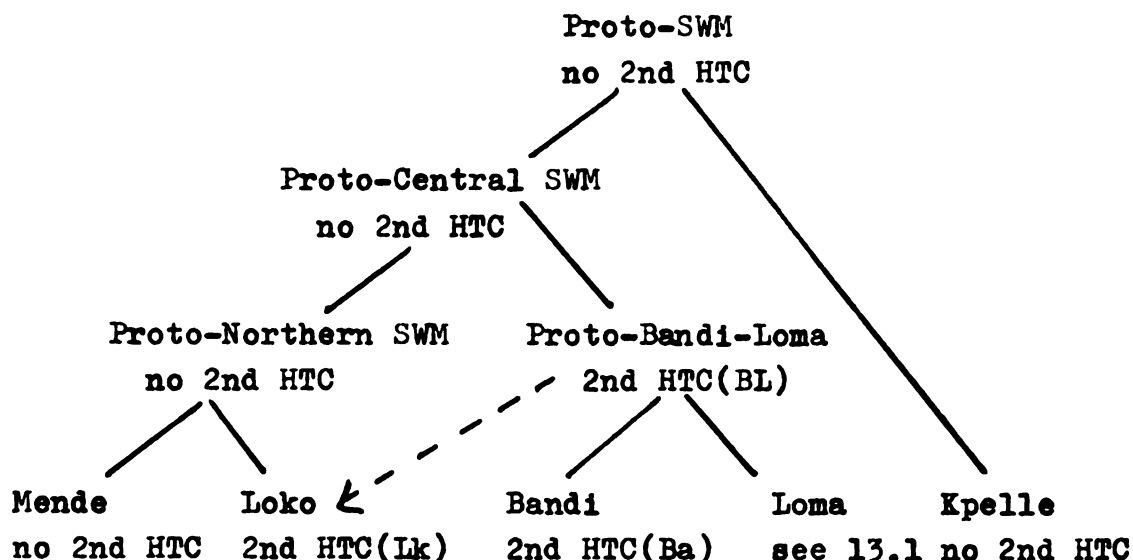


Figure 10-5: The development of the SWM Second High Tone Copying rule.

10.5 Low Tone Advancement

The Low Tone Advancement rule, found in Bandi and Proto-Bandi-Loma, appears in Loma as High Tone Advancement after having undergone the Tone Inversion process (see chapter 13). The structural description of the narrower Bandi version includes only non-possessed nominals and possessed inalienable nouns. This rule advances the domain of an initial sequence of non-high tones one syllable to the right. The broader Loma High Tone Advancement rule advances a high tone on to the next morpheme for as many syllables as is possible. This rule has the restriction that it may not advance a high tone onto a syllable which is followed by a high tone if that high tone is either part of the same morpheme or of the suffix.

The narrower Bandi rule most likely reflects the Proto-Bandi-Loma form as well.

Low Tone Advancement⁸

$v \rightarrow v / [(n)(cv)_0(c)_ (cv)_1]$ Nominals except
alienable poss.

The development of the Low Tone Advancement rule is summarized in Figure 10-6.

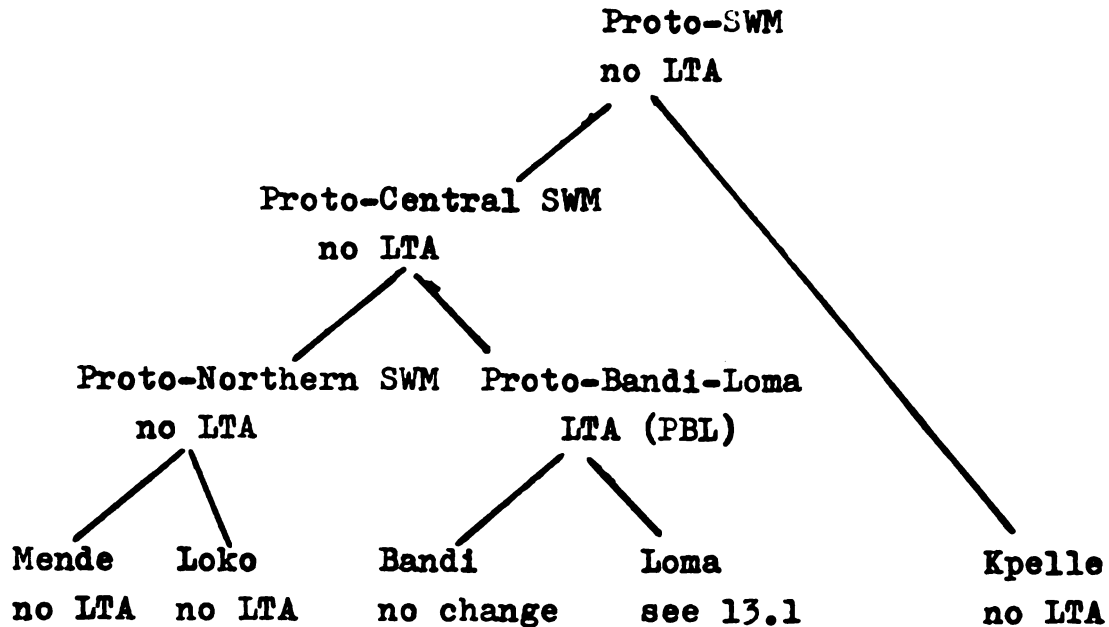


Figure 11-6: The development of the SWM Low Tone Advancement rule.

Low Tone Advancement may have arisen in Proto-Bandi-Loma in order to avoid a merger of first and third person singular corporal possessive pronouns. Assuming that the corporal possessive pronouns in Proto-Central SWM were \dot{n} - (<PSWM $\ast\dot{n}$ -) 'my' and n_1 - (<PSWM $\ast\dot{n}_1$ -) 'his', then the base forms for 'my foot' and 'his foot' in Proto-Central SWM were as follows

$\ast n-k'ow\acute{o}-\acute{i}$ my foot $\ast n-k'ow\acute{o}-\acute{i}$ his foot

When the gemination rule broadened to include all nasals in Central SWM, it would have been expected to merge the two forms above:

*n-kówó-í	$\xrightarrow{\text{GEM}}$	*k-kówó-í	my foot
*n-kówó-í		**k-kówó-í	his foot

These forms did not merge. In Proto-Northern Mande, the first and third person singular pronouns restructured, *n- > nɛa 'my' and *n₁- > Me: ngíí and Lk: alaa. In Proto-Bandi-Loma, this merger was also avoided, but in this case by the Low Tone Advancement Rule.

*n-kówó-í	$\xrightarrow{\text{LTA}}$	$\xrightarrow{\text{GEM}}$	k-kówó-í	my foot
*n-kówó-í		*n-kówó-í	k-kówó-í	his foot

This hypothesis would also explain why Low Tone Advancement in Bandi applies only to constructions containing n₁- or n₂- (see 6.16).

10.6 The Suffix rules

None of the numerous tone rules which apply specifically to the weak suffixes in SWM show sufficient similarity to permit any generalization concerning their convergent or divergent development. Rather, the existence of a set of tonal rules which apply to a suffix not separated from the stem by a consonant may be indicative of universal forces working against the independent tonal existence of these so-called "weak suffixes."

10.7 Downdrift

Of the two variants of the Downdrift rule found in the SWM languages, the narrowest in range of application appears in Kpelle. Here the rule applies only to the first non-low tone of the last word of the Kpelle sentence.

Downdrift

$[-low] \quad \text{----} \rightarrow \quad [+lowered] \quad / \quad [+low] (o) __ (cv) \#S$

The other variant, the simpler of the two, applies to all $[+high]$ tones which follow $[-high]$ tones. All of the SWM languages but Kpelle have this rule (see 2.2).

Downdrift (P)

$[+high] \quad \text{---} \rightarrow \quad [+lowered] \quad / \quad [-high] (o) __$

According to the assumption that rules tend to simplify over time rather than become more complex, the Kpelle version of the rule and not the other should be found in Proto-SWM. However, the Kpelle version of the Downdrift rule does not appear to represent the Downdrift rule of Proto-SWM because Downdrift (P) also occurs in Bambara, a Northern Mande language. If Downdrift (P) occurs both in Northern and Southwestern Mande, then the rule must have restructured in Kpelle. Were Downdrift (Kp) the original SWM version of the rule, then the development of the rule would have involved two identical restructurings, one in Bambara, one in Central SWM. Why two identical restructurings should have taken place requires an explanation, and none is

available.

10.8 Contour Reduction

Contour Reduction, like Downdrift, has two SWM variants. The more restricted of these rules occurs in Kpelle and presumably Proto-SWM. This rule reduces contour tones to simple high tones by eliminating the non-high tone component when it occurs morpheme-internally.

Contour Reduction (P)

$$v \quad \text{----} \rightarrow \quad \acute{v} / \left\{ \begin{array}{l} c\acute{v}_{-ov} \\ ov\acute{c}_{-v} \end{array} \right\} \quad (\text{where } \acute{v}\acute{v} = \acute{v} \text{ see 2.4})$$

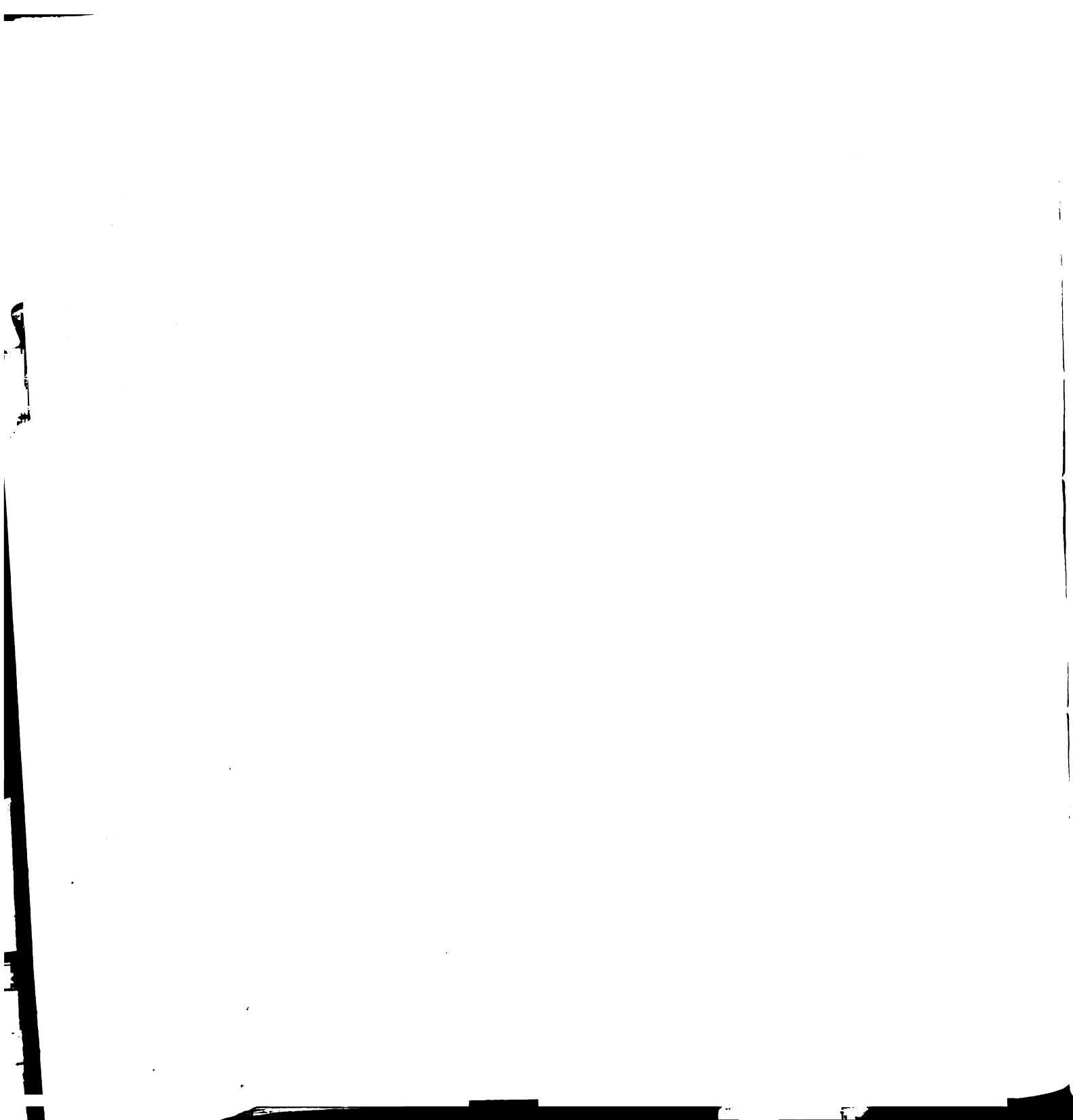
Because Contour Reduction (P) also corresponds to processes found in Bambara Tone rule 1 (see 10.2), it appears likely that this form of the rule was part of Proto-Northern Western Mande

Contour Reduction (P) simplified in Central SWM where it applies to any contour tone. This rule reduces contour tones by eliminating the non-high component, unless the non-high tone component occurs sentence-finally.

Contour Reduction (C)

$$v \quad \text{---} \rightarrow \quad \acute{v} / \left\{ \begin{array}{l} c\acute{v} \\ ov\acute{v}_{-...} \end{array} \right\} \quad (\text{where } \acute{v}\acute{v} = \acute{v})$$

Figure 10-8 below summarizes the development of the Contour Reduction rule.



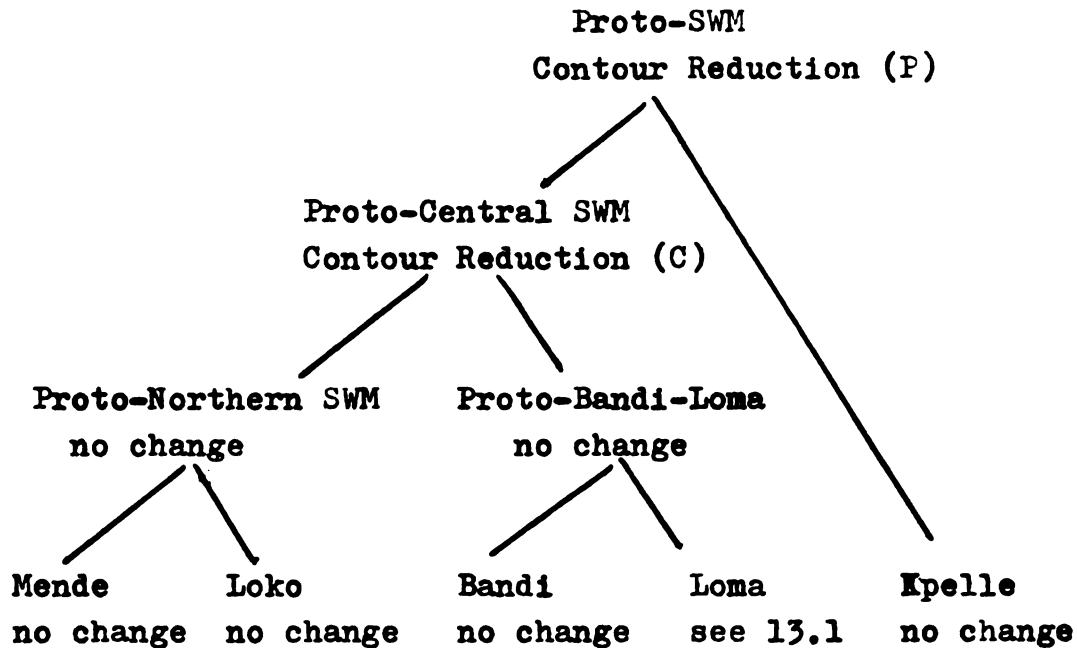


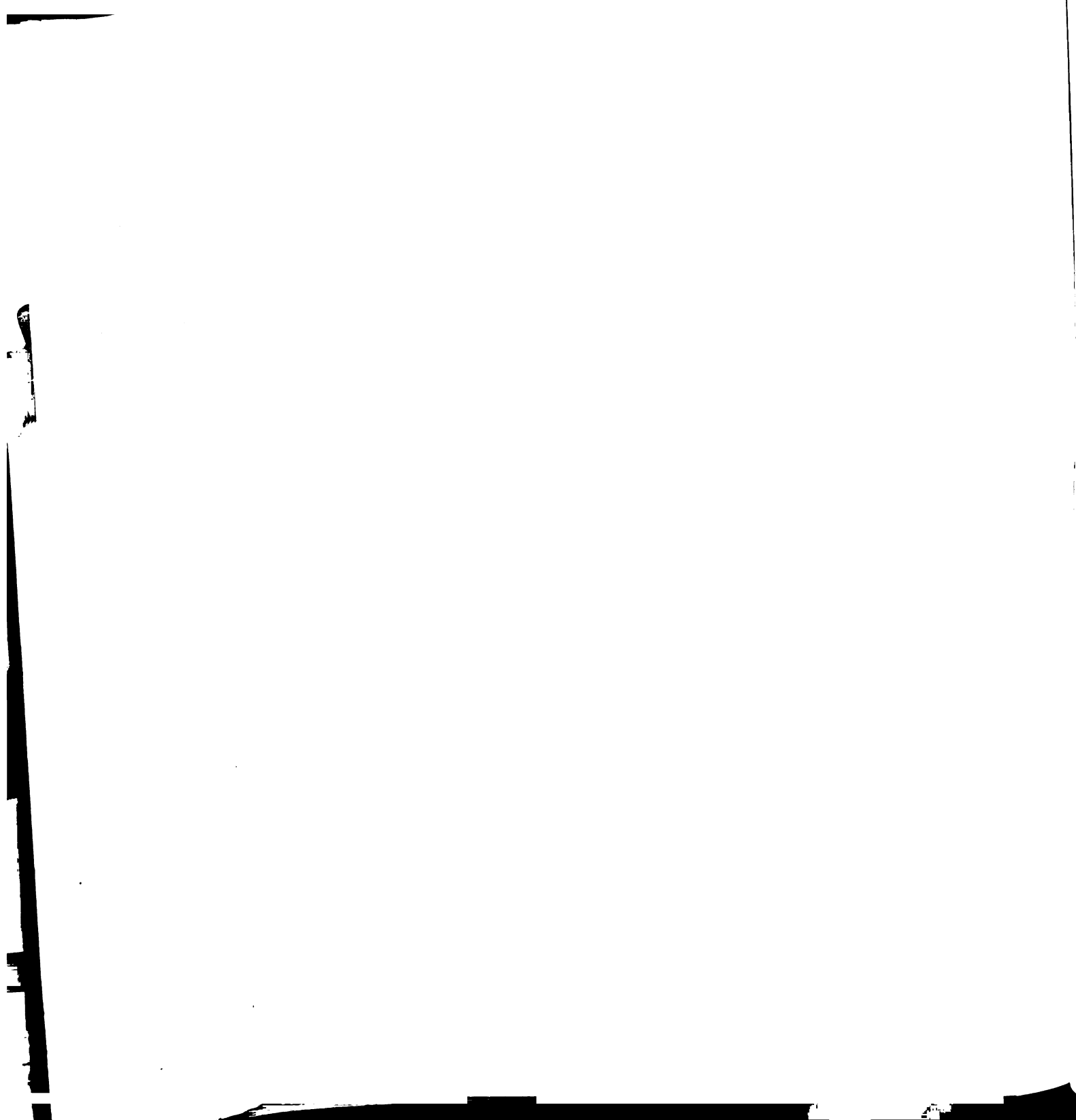
Figure 10-7: The development of the SWM Contour Reduction rule.

The rule sequence Downdrift followed by Contour Reduction has the special property of always appearing at the end of the ordered list of rules, despite the addition of new tonal rules. When the Second High Tone Advancement and Low Tone Advancement rules were acquired in Proto-Bandi-Loma, they were crucially ordered ahead of Downdrift and Contour Reduction. This evidence puts the Downdrift and Contour Reduction rules in a special category of tone rule, possibly output constraints, but these rules, like other tone rules, are capable of undergoing change.

Footnotes

Chapter 10

1. The justifications for the unattested stages of Southwestern Mande are given in chapter 9.
2. Both of these constructions are included in my definition of nominal compound (see 3.5).
3. Such associative particles are attested in the Northern Mande languages. For example, the associative particle in Susu is a non-high-toned ɛ (see Hous 1963).
4. Or Contouring (Proto-Northern-Western).
5. The term "first" of "First High Tone Copying" signifies that this rule is the first of two very similar high-tone-copying rules found in Southwestern Mande.
6. The Second High Tone Copying rule in Loma combined with the First High Tone Copying rule to produce a rule called Low Tone Spread (see 7.1).
7. Chapter 4, Footnote 3, provides independent evidence to prove that nje-wúlo 'aunt' is a fossilized compound.
8. The need for the prefixed nasal in the structural description of this rule is discussed in 6.1.



Chapter 11

The Diachronic Development of Native Southwestern Mande Tone Classes

11.0 This chapter describes only the development of the five "native" Southwestern Mande tone classes. Because the remaining tone classes lack convincing cognates, they are presumed to be "non-native," having been acquired independently by the individual languages since the break-up of Proto-SWM. A summary of the development of the five native tonal classes appears below in Figure 11.1.

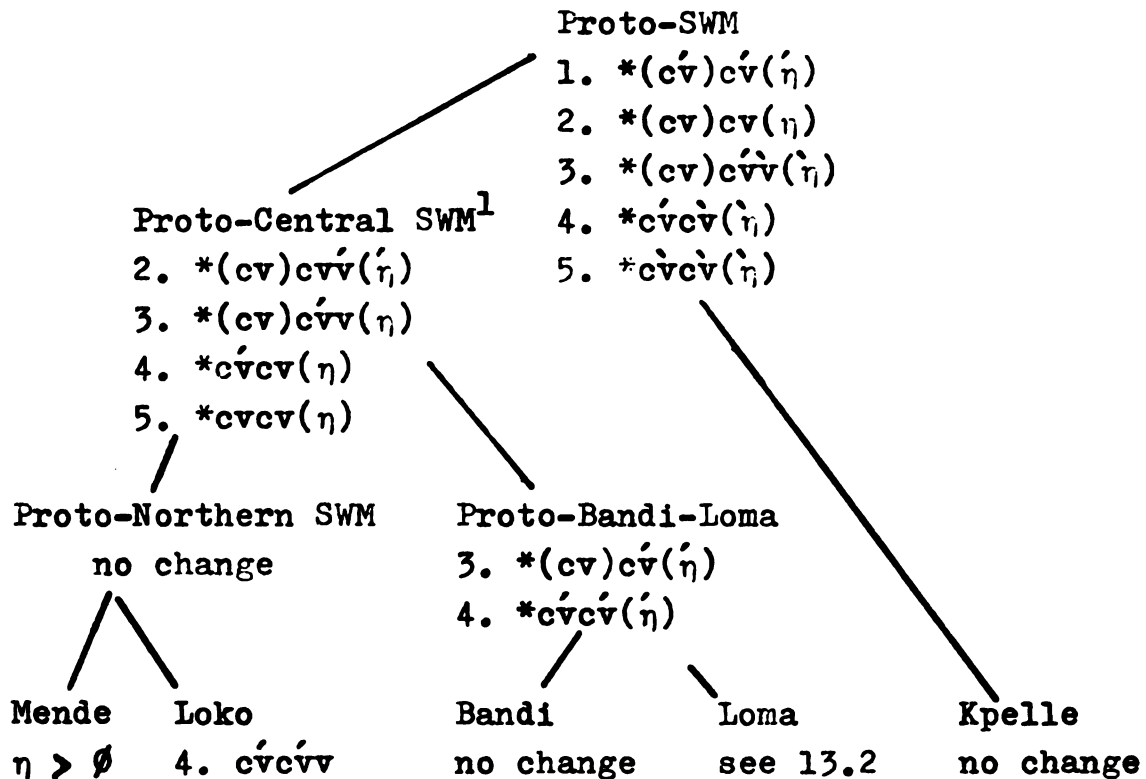


Figure 11-1: The development of the SWM native tone classes.

For the sake of clarity, the order of presentation of the development of these tonal classes begins with class 5 and ends with class 1. Also, because the diachronic development of Loma tone involves primarily the unique process of Tonal Inversion, which affects all of the Loma rules and base forms, chapter 13 has been set aside for the discussion of Loma tonal development.

11.1 Class 5 Nouns

The base tones of Proto-SWM class 5 nouns, c̀vc̀v(̀η) are true low tones. Thus Proto-SWM, like modern Kpelle, is a language with three discrete tonal levels. When the feature value [+low] was lost in Central SWM, only two discrete tonal levels remained. The loss of the feature [+low] may have been related to the restructuring of class 2 nouns (11.4), for with this restructuring, the feature value [+low] is no longer necessary to maintain the distinctiveness of class 5 nouns.

	Proto-SWM		Proto-Central SWM
class 2	*(cv)cv(η) >		*(cv)cv́v(́η)
class 5	*c̀vc̀v(̀η) >		*cvcv(η)

No further restructurings of class 5 nouns occurred in Central SWM with the possible exception of Loma, for which data is lacking. Figure 11-2 summarizes the development of SWM class 5 nouns.

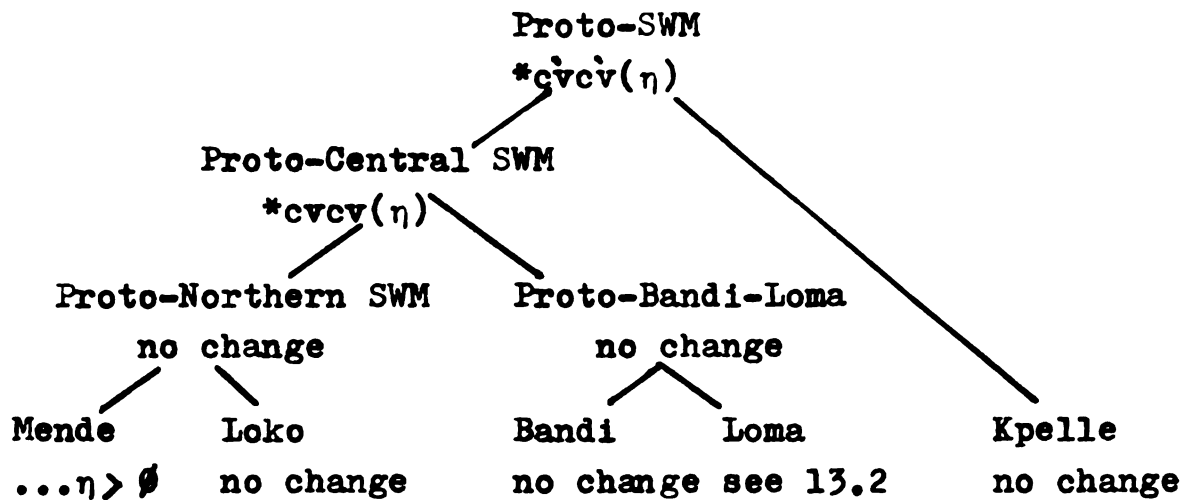


Figure 11-2: The development of SWM class 5 nouns.

11.2 Class 4 Nouns

The base form of class 4 nouns in Proto-SWM is *c̣ṿc̣ṿ(̣) as it is in modern Kpelle. In Central SWM, the non-high tone lost its [+low] component and the base form of class 4 nouns restructured from *c̣ṿc̣ṿ(̣) to *c̣ṿc̣ṿ(̣), the latter being the base form of this tonal class in modern Mende.

Apparently due to the effects of the Second High Tone Copying rule, class 4 nouns in Proto-Bandi-Loma restructured from *c̣ṿc̣ṿ(̣) to *c̣ṿc̣ṿṿ(̣) (see 10.4). Class 4 nouns again restructured in Proto-Bandi-Loma from *c̣ṿc̣ṿṿ(̣) to *c̣ṿc̣ṿ(̣). The intermediate stage, c̣ṿc̣ṿṿ(̣), in Proto-Bandi-Loma is posited on the basis of the assumption that Second High Tone Copying is responsible for the restructuring of class 4 nouns. In Loko, where there is also a Second High Tone Copying rule, class 4 nouns also restructured from *c̣ṿc̣ṿ(̣) to c̣ṿc̣ṿṿ(̣), and c̣ṿc̣ṿṿ is an attested form in Loko. Furthermore, with this intermediate stage in Proto-Bandi-Loma, the further

restructuring of class 4 nouns from *cvcṽv(̃) to *cvcṽ(̃) and the restructuring of class 3 nouns from *(cv)c̃vv(̃) to (cv)c̃ṽ(̃) can be seen to be the result of a single diachronic process which reduced morpheme-final falling tones to simple high tones (see 11.3). Without this intermediate stage, the restructuring of class 3 and class 4 nouns must be considered as independent developments. Figure 11-3 summarizes the development of class 4 nouns.

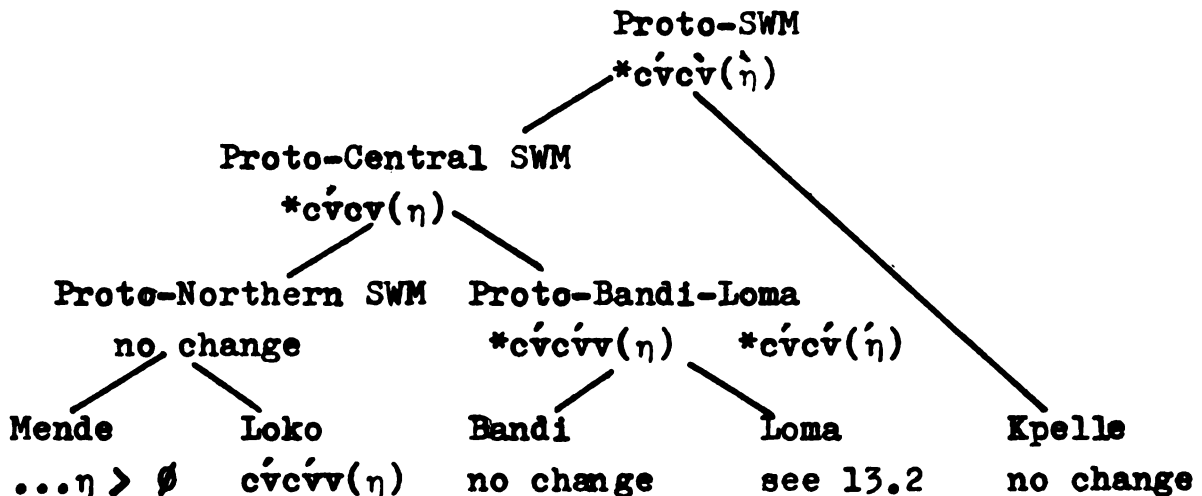


Figure 11-3. The development of SWM class 4 nouns

11.3 Class 3 Nouns

The base representation of class 3 nouns in Proto-SWM is assumed to be *(cv)c̃ṽ(̃). With the loss of the feature value [+low] in Central SWM, this base form restructured to *(cv)c̃vv(̃). In Proto-Bandi-Loma, this form restructured to *(cv)c̃ṽ(̃) due to the effects of a more general rule which reduced Proto-Bandi-Loma morpheme-final falling tones to simple high tones. This rule also affected class 4 nouns (11.2). Figure 11-4 summarizes

the development of class 3 nouns.

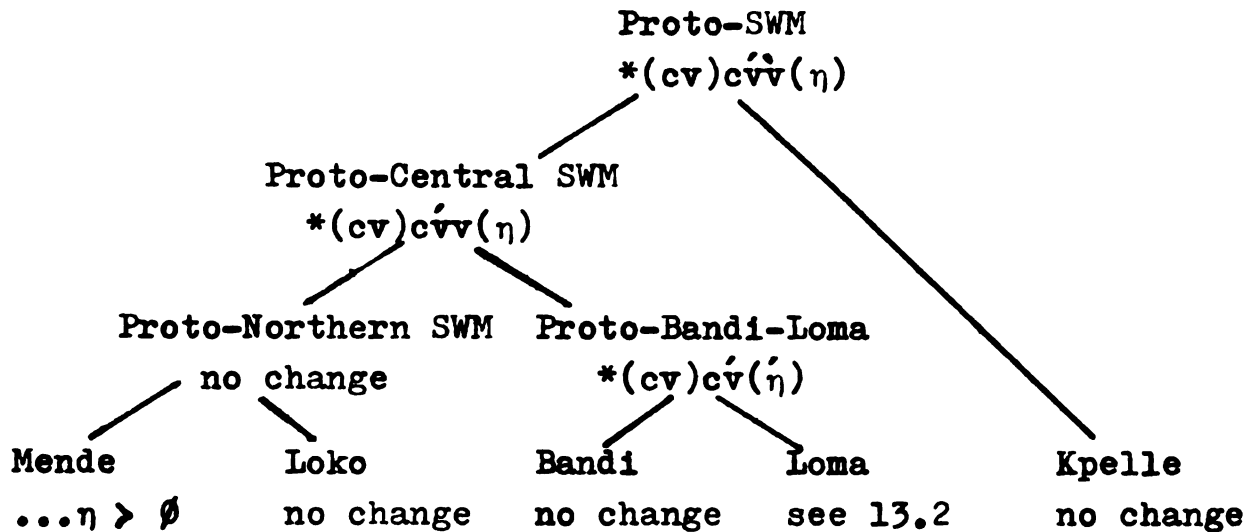


Figure 11-4: The development of SWM class 3 nouns.

11.4 Class 2 Nouns

The base forms of class 2 nouns in Kpelle, (cv)cv(η), are presumed to be identical to those of Proto-SWM. These nouns restructured tonally in Central SWM to *(cv)cṽv̄(ḥ), which, as was pointed out (10.2), involved the absorption of the Proto-SWM Contouring rule.

Proto-SWM		Proto-Central SWM
*(cv)cv(η)	>	*(cv)cṽv̄(ḥ)

As a result of this restructuring, Central SWM class 2 nouns have a different surface tonal patterning from those of Proto-SWM and modern Kpelle.

Kpelle		Loko (representing Proto-Central SWM)	
pere	a road	pelé-ná	the road
peré pu.u	ten roads	pelé-pu.u	ten roads
pere+nínà	new road	pele+níná-ná	the new road

In Central SWM, the final tone of weak-conditioning class 2 nouns not ending in a nasal consonant is high except in nominal compounds, while the final tone of class 2 nouns in Proto-SWM and Kpelle is high only when followed by a non-high tone. Class 2 nouns which do end in a final nasal, *cvcv́v(ń), in Central SWM always have a high final surface tone. This situation is discussed below (11.46).

11.41 Monosyllables of Classes 1 and 2

In Kpelle, three sets of tonal patterns of monosyllables are associated with tone classes 1 and 2: one which patterns like class 1 bisyllabic nouns (e.g., lá 'mouth'), one which patterns like class 2 bisyllabic nouns (e.g., kpa 'debt'), and one which patterns like a class 2 bisyllabic noun in a nominal compound and like a class 1 bisyllabic noun elsewhere (e.g., yá 'water', bá 'cooked rice'). The different tonal patterns of these Kpelle monosyllables are as follows:

gloss	base	indefinite	ten _____	old _____
mouth	<u>lá</u>	<u>lá</u>	<u>lá</u> pu.u	<u>lá</u> +pòlò
water	<u>yá</u>	<u>yá</u>	<u>yá</u> pu.u	<u>yá</u> +pòlò
debt	<u>kpa</u>	<u>kpa</u>	<u>kpaá</u> pu.u	<u>kpa</u> +pòlò

Because of the limited number of examples of each of the above types of nouns in Kpelle, one cannot state with certainty what is going on, and, consequently, the hypothesis advanced in 8.5 that monosyllabic alienable class 1 nouns (e.g., yá 'water') do undergo High Tone Displacement, while their inalienable monosyllabic counterparts (e.g.,

lá 'mouth') do not, must be considered as tentative.

With the restructuring of class 2 nouns in Central SWM, class 2 monosyllables acquired a cvv(ʔ) base form and as a result of the broader Central SWM Contour Reduction rule (which reduces all short contour tones except sentence-final falling tones to simple high tones), the tonal patterns of *yá type and *kpa type monosyllabic nouns merge in Central SWM.

Loko (representing Proto-Central SWM)

gloss	base	definite	ten_____	the old _____
water	yáá	njá-ná	njá pu.u	nja+óhá-ná
debt	kpaa	kpá-ná	kpá pu.u	kpa+óhá-ná

Because each of these tonal types has the same tonal pattern in Central SWM, its proper diachronic tone class can not be detected synchronically. And because they have the same tonal pattern synchronically, they must be assigned to the same synchronic tonal class. Whether this is class 1 or 2 is considered below (11.43) following a discussion of the base forms of the Central SWM alienable possessive pronouns.

11.42 Alienable Possessives

Both the Lowering and High Tone Displacement (HTD) rules broadened in Central SWM to include alienable possessives as well as nominal compounds. Furthermore, each of the component rules of HTD underwent additional broadenings. First High Tone Copying (1st HTC), the first component of HTD, broadened to include all morpheme-final high

tones (10.3). The High Loss rule, the second component of HTD, when extended to alienable possessives will still apply if and only if 1st HTC applies, but in this situation, the High Loss rule does not lower the tones of the pronouns with simple high tones. The following examples from Loko illustrate the use of High Tone Displacement in inalienable possessives where HTD is optional. Here, even when HTD applies, the tone of the pronoun 'my' is not lowered. The same situation exists in alienable possession in all of the Central SWM languages where HTD is obligatory.

Loko	(without HTD)	(with HTD)	Base	Gloss
ní-ke.ε̌ε̌	ní-ke.ε̌ε̌	ní-ké.ε̌ε̌	ní-ke.ε̌ε̌	my father
ngí-ke.ε̌ε̌	ngí-ke.ε̌ε̌	ngi-ké.ε̌ε̌	ngií-ke.ε̌ε̌	his father

Why does the High Loss rule exclude the high-toned pronouns such as ní 'my' but not the pronouns with underlying rising tones such as ngií 'his'? The answer to this question may have had something to do with the expanded use of the nominal prefix *n₂-. This prefix in Kpelle and Proto-SWM carries the meaning 'prerference' (see 8.2), indicating that the noun has been previously mentioned in the text. In Central SWM *n₂- affixes to any noun-phrase initial class 1-5 noun with no apparent change in meaning. Also in Central SWM, this prefix, like all low tones in Proto-SWM, lost its [+low] value and became a non-high, [-high, -low], tone (see 11.1).

With the broadened use of *n₂-, any class 1 monosyllabic alienable noun when the first constituent of a noun phrase is preceded by this non-high-toned prefix.

Loko: n-yá+óhá-ná (base) --> nja+óhá-ná (surface)
the old water

This situation permits a revision of the High Loss rule, for now all high tones which are lowered by the High Loss rule are preceded by a non-high tone.

High Loss (Central SWM)

[+high] --> [-high] / [-high](c)___+ (if 1st HTC applies)

With this restructuring, then, a noun-phrase initial high tone, such as that of the pronoun ní- 'my', would not be lowered by the High Loss rule of Proto-Central SWM, while the high tone component of the pronoun ngíí- 'his' would be.

Furthermore, this rule restructuring provides an explanation for the diachronic development of the third person plural pronoun, which I have reconstructed in Proto-SWM as *n-tí-. The Kpelle reflex of this pronoun is ddí-, showing normal consonant and tonal development. Given the restructured High Loss rule, *n-tí- would produce the same surface tonal alternations as would an underlying rising tone. Because the surface tonal alternations of the historical *n-tí- and *ngíí are identical, then synchronically, these pronouns should have the same underlying tonal representation. Since these two pronouns exhibit the same

tonal patterning as *yá 'water' and *kpa 'debt', all of the morphemes should belong to the same tonal class in Central SWM.

11.43 The Base Form of Class 2 Monosyllables

From the available evidence, an underlying rising tone, cv́, rather than a simple high tone, cṽ, appears more likely for these nouns: *yá, *kpa, *ngíí, and *n-tí. First, these nouns pattern identically in Central SWM, all undergoing both the 1st HTC and High Loss rule. This patterning is distinct from the pronouns ní- 'my', bí- 'your', and wú- 'your(pl)' which undergo 1st HTC but not High Loss. If these two types of pronouns have natural underlying base tones, then a simple high tone for the ní- type pronouns and a rising tone for the ngíí- type pronouns are the most likely base forms.²

Secondly, class 2 monosyllabic morphemes also need an underlying non-high tonal component preceding the high tonal component in order to account for otherwise non-predictable downsteps, such as Mende nyá-njé from underlying nyá-njeé 'my mother'.

Finally, the surface tones of Kpelle class 2 monosyllables that have undergone the Contouring rule are rising (see 8.12). On the basis of this evidence, then, the underlying representations of class 2 monosyllables must be cv́. And because class 1 alienable monosyllables, such as *yá 'water' and the pronoun *ntí- 'they' have the same tonal patterning in Central SWM, these morphemes should

also have underlying rising tones (i.e., Proto SWM: *yaá 'water' and *tií- 'they').

11.44 The Base Forms of Class 2 Bisyllables

Although the underlying form of class 2 monosyllables has been established as *cv́, the underlying form of class 2 bisyllables could be either *cvcv́(ń) or *cvćv(ń) given the above Central SWM formulation of the High Loss rule. What evidence is there to support either of the above representations? Proto-Bandi-Loma provides the strongest evidence in favor of *cvcv́(ń) over *cvćv(ń). When morpheme-final falling tones restructured to simple high tones in Proto-Bandi-Loma, class 3 nouns became *(cv)ćv(ń) from *(cv)ćvv(ń) and class 4 nouns became *ćvćv(ń) from *ćvćvv(ń) from *ćvcv(ń).

Proto-Central SWM		Proto-Bandi-Loma
class 1	<u>*(cv)ćv(ń)</u> > no change >	<u>*(ćv)ćv(ń)</u>
2	<u>*(cv)cvćv(ń)</u> > no change >	<u>*(cv)cvćv(ń)</u>
3	<u>*(cv)ćvv(ń)</u> >	<u>*(cv)ćv(ń)</u>
4	<u>*ćvcv(ń)</u> > <u>*ćvćvv(ń)</u> >	<u>*ćvćv(ń)</u>
5	<u>*cvcv(ń)</u> > no change >	<u>*cvcv(ń)</u>

This restructuring resulted in the merger of class 4 and class 1 nouns, but not the merger of class 3 and class 2 nouns. Had the base form of class 2 bisyllabic nouns been **cvćv(ń), this merger would have occurred. Because such a merger did not take place, the underlying form of class 2 nouns in Proto-Bandi-Loma must have been *(cv)cvćv(ń) and not **cvćv(ń). Also, had the base tone of Proto-Bandi-Loma

been ****cvcv́(ń)**, and following Tonal Inversion in Loma ****cvcv(ń)** (see 13.2), then the tonal behavior of this tonal class would have been the same as that of all the other tonal classes in Loma. Yet the class 2 nouns not ending in a nasal are distinct from all other Loma tonal classes.

If class 2 nouns did not further restructure from ***cvcv́(ń)** to ****cvcv́(ń)**, then an explanation must be offered as to why and how subsequent generations of Central SWM speakers could have constructed the more complex underlying tonal type in their synchronic grammars. The best answer available at this time is that because all morpheme-final alternating tones exhibit the same surface tonal alternations, both those belonging to monosyllabic and bisyllabic morphemes, they must have the same underlying tonal representation. Since this underlying representation must be a rising tone for monosyllables, the underlying representation of the morpheme-final alternating tone of bisyllables is also rising.

11.45 The Base Form of Class 2s Nouns

Earlier in this chapter (11.41), I mentioned that Central SWM class 2 nouns ending in an underlying nasal, ***(cv)cvcv́(ń)**, have an invariable high surface tone while those ending in a vowel do not.

Loko	Base (historical)	Surface
the old chief	n-mahaáń+óhá-ná	maháńg+óhá-ná
the old cow	n-nikaá+óhá-ná	nika+óhá-ná



Historically, the presence of the morpheme-final nasal causes this difference in tonal patterning, because in this situation, the High Tone Displacement rule displaces the high tone of the nasal and not that of the preceding vowel. When no morpheme-final nasal is present, the high tone component of the rising tone is displaced and replaced by a non-high tone. Derivations of the two above Loko examples are given in 5.5.

If class 2 nouns ending in a nasal have an underlying representation of $*(cv)cv\acute{v}(\acute{n})$ corresponding to class 2 nouns without the nasal $*(cv)cv\acute{v}$, then the $*(cv)cv\acute{v}\acute{n}$ representation would be classified as abstract, for it is different from its non-alternating surface representation. And unless there is good evidence to the contrary, the more concrete representation of these class 2 nouns, $*(cv)cv\acute{v}\acute{n}$, would be preferable. But if this proposed restructuring took place, how then did Mende $(cv)cv\acute{v}\acute{n}$ nouns restructure and merge with Mende class 2 $(cv)cv\acute{v}$ nouns when Mende lost its morpheme-final nasal?

Assuming that at the time of the loss of morpheme-final nasals in Mende, the Central SWM High Loss rule was still in effect, then when morpheme-final nasals in Mende were lost ($(cv)cv\acute{v}\acute{n} > (cv)cv\acute{v}$), this rule would lower the final high of both $(cv)cv\acute{v}$ ($< (cv)cv\acute{v}\acute{n}$) and $(cv)cv\acute{v}$ in the same environments, thus creating a situation where two different historical underlying tonal types have identical surface tonal patterns. Synchronically, these underlying

tonal types would merge into a single tonal type which is, as argued above, (cv)cv́.

Proto-Central SWM		Pre-Mende		Mende
*(cv)cv́	>	*(cv)cv́	>	(cv)cv́
*(cv)cv́ŋ	>	*(cv)cv́	>	(cv)cv́

5.46 Mende Class 6 Nouns

Once the two class 2 tonal types merged, the simpler Mende version of the High Loss rule emerged. This rule involved two innovations. First, the rule was totally separated from the First High Tone Copying rule, so that it lowered the high tone component of any short rising tone when followed by a high tone. Secondly, the tonal situation is such that the High Loss rule can be stated more simply if it is restricted to short rising tones. Both of these developments are simplifications.

High Loss (Me)

́ → v / v_(c)́

With the Mende version of the High Loss rule, the way is prepared for the acquisition of class 6 nouns. Presumably, class 6 nouns were acquired after the restructuring of (cv)cv́ŋ nouns in Mende to (cv)cv́ and the restructuring of the High Loss rule. Since class 6 nouns in Mende have an invariant surface appearance of cvć, their underlying representation is likewise cvć. Because the final syllable of this tonal type is high, rather than rising, these nouns undergo First High Tone Copying, but not High

Loss.

Mende	Class	Base		Surface	Gloss
	2	peleé+kúlá-í	-->	pele+gúle-í	the short house
	6	fandé+kúlá-í		fandé+gúle-í	the short thread

11.47 Summary

Thus, from the available evidence, class 2 nouns restructured from * $(cv)cv(\eta)$ to * $(cv)cv\acute{v}(\acute{\eta})$ in Proto-Central SWM. Secondly * $(cv)cv\acute{v}\acute{\eta}$ nouns further restructured in Proto-Central SWM to * $(cv)c\acute{v}\acute{\eta}$. Thirdly, with the loss of morpheme-final nasals in Mende, * $(cv)c\acute{v}\acute{\eta}$ nouns further restructured to * $(cv)c\acute{v}$ and then to $(cv)cv\acute{v}$ in Mende. Figure 11-5 summarizes the development of class 2 nouns in SWM.

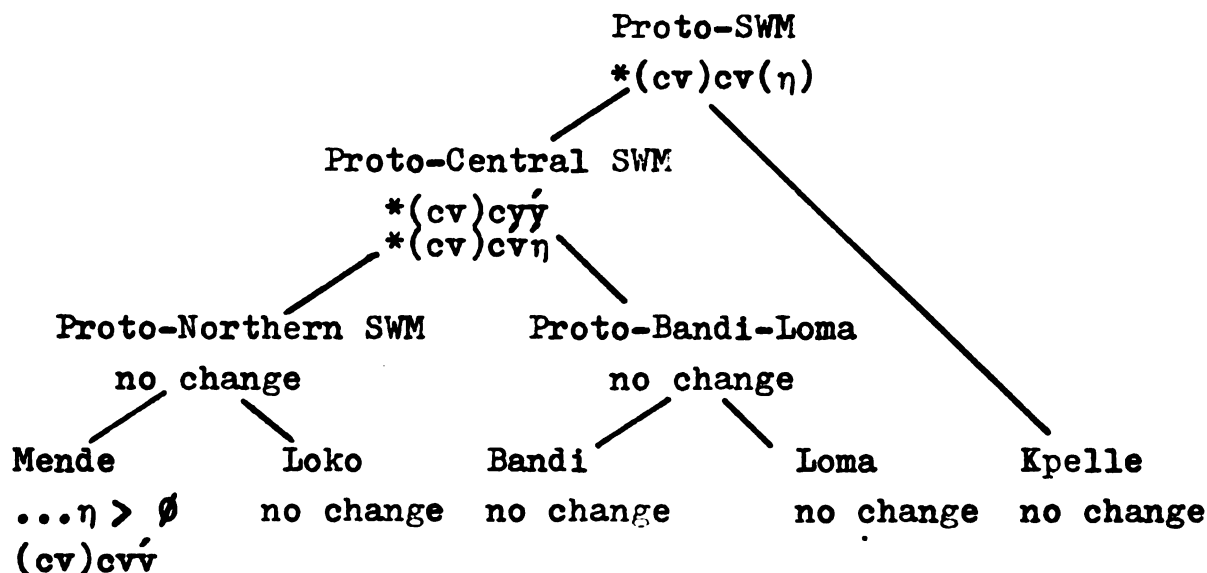


Figure 11-5: The development of SWM class 2 nouns.

11.5 Class 1 Nouns

No evidence is available to support the restructuring of class 1 nouns in Southwestern Mande, save for the above mentioned restructuring of class 1 monosyllabic alienable nouns (11.41) and the tonal inversion of these nouns in Loma (see 13.2). Figure 11-6 summarizes the development of class 1 nouns in SWM.

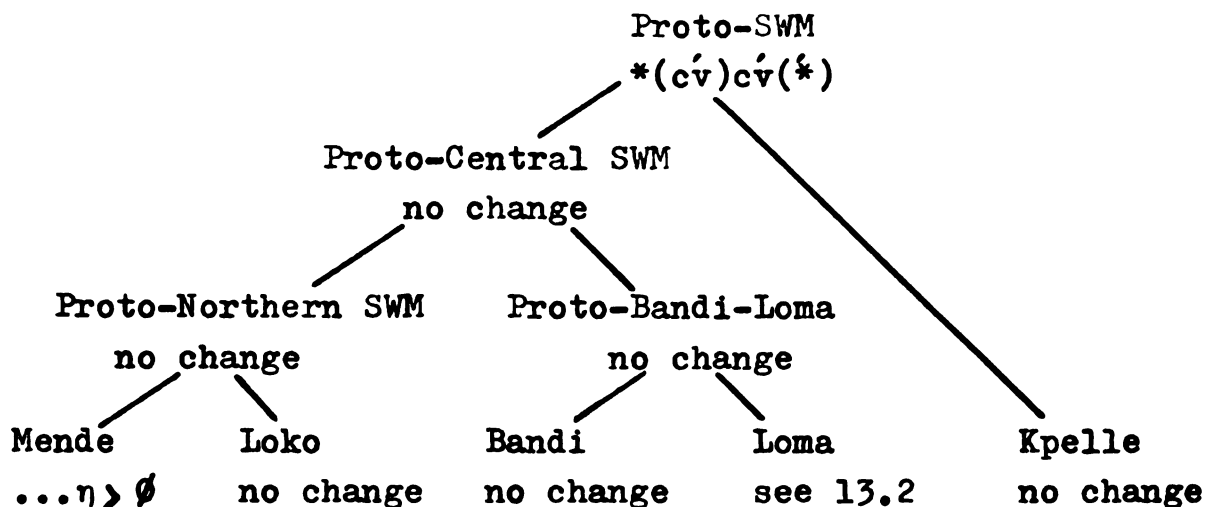


Figure 11-6: The development of SWM class 1 nouns.

Footnotes

Chapter 11

1. Proto-SWM alienable, monosyllabic nouns restructured in Proto-Central SWM from *cv(ŋ) to *cvv(ŋ).
2. If the underlying difference between the tonal behavior of these pronouns is marked by a diacritic feature, rather than a phonetic feature, then the following arguments, which assume that certain surface tonal peculiarities must reflect particular underlying natural tonal representations, are meaningless and, as far as I can tell, the nature of the underlying representation is indeterminate.
3. The Mende morpheme fandé 'cotton, thread' is quite likely related to the term 'fanti' as in 'fanti-cloth' which "has become a reference to all brightly colored commercial cotton yardage with African inspired designs. The term is derived from the fact that the handmade and handprinted cloth worn by Fanti fishermen from Ghana was much admired by Liberians" (d'Azevedo 1967:17).

Chapter 12

Proto-Southwestern Mande and Northern Mande

The search for cognates between Southwestern Mande and Northern Mande has revealed a consistent correlation between Southwestern Mande class 1 nouns, *cvćv, and Northern Mande cvćv nouns, and between Southwestern Mande class 2 nouns, *cvcv, and Northern cvcv nouns. These two tone classes contain most of the morphemes of Northern Mande. Below, some forms from Susu, a Northern Mande language, are compared with reconstructed Proto-Southwestern Mande morphemes.¹ The underlying tones of the Susu nouns which have a cvćv tone pattern are quite likely cvcv.

Gloss	Reconstructed Proto-SWM	Susu (Houis 1963)
medicine	*sále (1)	sérí
tree	*wúlú (1)	wurí
rat	*nyíná (1)	nyéné
root	*sánké (sáké)(1)	sáké
cow	*ninka (nika)(2)	nǝgé
chief	*mansa (masa)(2)	magé
monkey	*kula (2)	kulé
chicken	*te.e (2)	tǝxé
bird	*ɲoni (2)	xǝní

The absence of convincing correspondences between

any of the nouns of the remaining tone classes (3, 4, and 5) and Northern Mande nouns indicates that only classes 1 and 2 were part of the common development of Southwestern Mande at the time of its separation from Northern Mande.

The relatively recent establishment of classes 3, 4, and 5 explains why they constitute such a small percentage of the total number of SWM nouns. Based on a rough calculation, my data show that classes 1 and 2 contain around 80% of the common SWM nouns while the other three classes make up the remaining 20%. These percentages are given in Figure 12-1 below.

Class	Tone Pattern	Percentage
1	(ćv)ćv(ḡ)	43%
2	(cv)cv(ḡ)	38%
3	(cv)cv(ḡ)	13%
4	ćvc̀v(ḡ)	3%
5	c̀vc̀v(ḡ)	3%

Figure 12-1: Proto-SWM tone-class percentages.

Welmers(1961) clearly demonstrated that class 5 nouns in Kpelle represent borrowings. His arguments, which are summarized in 8.2, have to do with Kpelle class 5 nouns being outside the Kpelle phonological system. But, class 5 nouns appear in all of the modern SWM languages, and what is more, they show the same medial consonant correspondence as do the first four noun classes, namely a Central SWM prenasalized medial consonant corresponding to a Kpelle medial nasal.

Gloss	Mende	Kpelle
trousers	bele	bèrè
hat	bolo	bòlò
chisel	tondò	tònò
Sande	sande	sàné

Morphemes more recently borrowed do not show this medial consonant development.

Gloss	Mende	Kpelle
thread	fandé	fanté
lamp	lambó	lámpu

Furthermore, the arguments used by Welmers for Kpelle can be extended to include the Central SWM languages with the conclusion that class 5 nouns as a type were present in Proto-SWM. This hypothesis explains why this class is present in all of the SWM languages and why this class displays a medial consonant development which is consistent with the first four noun classes.

The lack of cognates between SWM class 5 nouns and Northern Mande nouns suggests that this tonal class was acquired by Pre-SWM after it separated from Northern-Western Mande. And if the nouns of class 5 are borrowings, then a number of the peculiar characteristics of this class become understandable: such as why this class contains such a small percentage of the number of common SWM nouns, why class 5 words can only be nouns and why, possibly, this class begins with a stressed low tone. It is also possible that since the establishment of class 5

nouns in Pre-SWM, this class has acquired additional members through borrowing.

Prior to the acquisition of class 5 nouns, there were only four tonal classes in Pre-SWM. At that time, the mid and low tones were in complementary distribution: low tones occurred following high tones and mid tones occurred elsewhere. The lower allotone may well have been the result of Downdrift. Whatever the explanation, Pre-SWM is a language with only two contrastive phonemic tones.

	Pre-SWM	
class 1	*(ćv)ćv(ḡ)	*[(ćv)ćv(ḡ)]
2	*(cv)cv(ḡ)	*[(cv)cv(ḡ)]
3	*(cv)cṽv(ḡ)	*[(cv)cṽv(ḡ)]
4	* ćvcv(ḡ)	*[ćvcv(ḡ)]

The three phonetic levels of this stage, however, may have made possible the borrowing of class 5 nouns, which contain true low tones, [-high, +low]. Having acquired a noun class with true low tones, Proto-Southwestern Mande then developed into a language with three contrastive levels of tone. Also, at about this time, class 3 and 4 nouns restructured to (cv)cṽv(ḡ) and ćvcv(ḡ) respectively.

Because class 4 nouns also have no cognates in Northern Mande and because of the low percentage of this class in Proto-SWM, this class, too, most likely consists of borrowed morphemes. The source of these borrowings has not been established.²

Prior to the acquisition of class 4 nouns, the tonal system of an earlier stage of Pre-SWM contained only three tonal classes. Class 3 nouns also have no cognates with Northern Mande nouns, but in this case, their acquisition by SWM may not be exclusively due to borrowing. Class 3 nouns have the tonological appearance of nominal compounds which are composed of class 1 and/or class 2 monosyllabic constituents.

The tonal rules of Proto-SWM and modern Kpelle are such that any combination of two class 1 and 2 monosyllabic nouns could produce a class 3 tonal pattern (see 8.5).

Class	Proto-SWM Base		Proto-SWM Surface
(1+1)	ćv+ćv	---->	cv+ćv̀
(1+2)	ćv+cv		cv+ćv̀
(2+1)	cv+ćv		cv+ćv̀
(2+2)	cv+cv		cv+ćv̀

If class 3 nouns are fossilized compounds constructed from class 1 and 2 nouns, then at this stage of development of Proto-Southwestern Mande, there are only two tonal classes: class 1, (ćv)ćv(ń), and class 2, (cv)cv(n). This conclusion ties in very neatly with the observation that only SWM tonal classes 1 and 2 have cognates in Northern Mande.

The objection to the hypothesis that class 3 nouns are fossilized compounds is the lack of convincing morphological evidence to back it up. What evidence is

available, is weak at best.

Mende	hindóo	from P-SW ^M	*sin+lóo	man
			*sin	man
			*lo	child
Mende	nyaháa	from P-SWM	*nya+sáa	woman
			* sa is a feminine suffix broadly used in SWM	

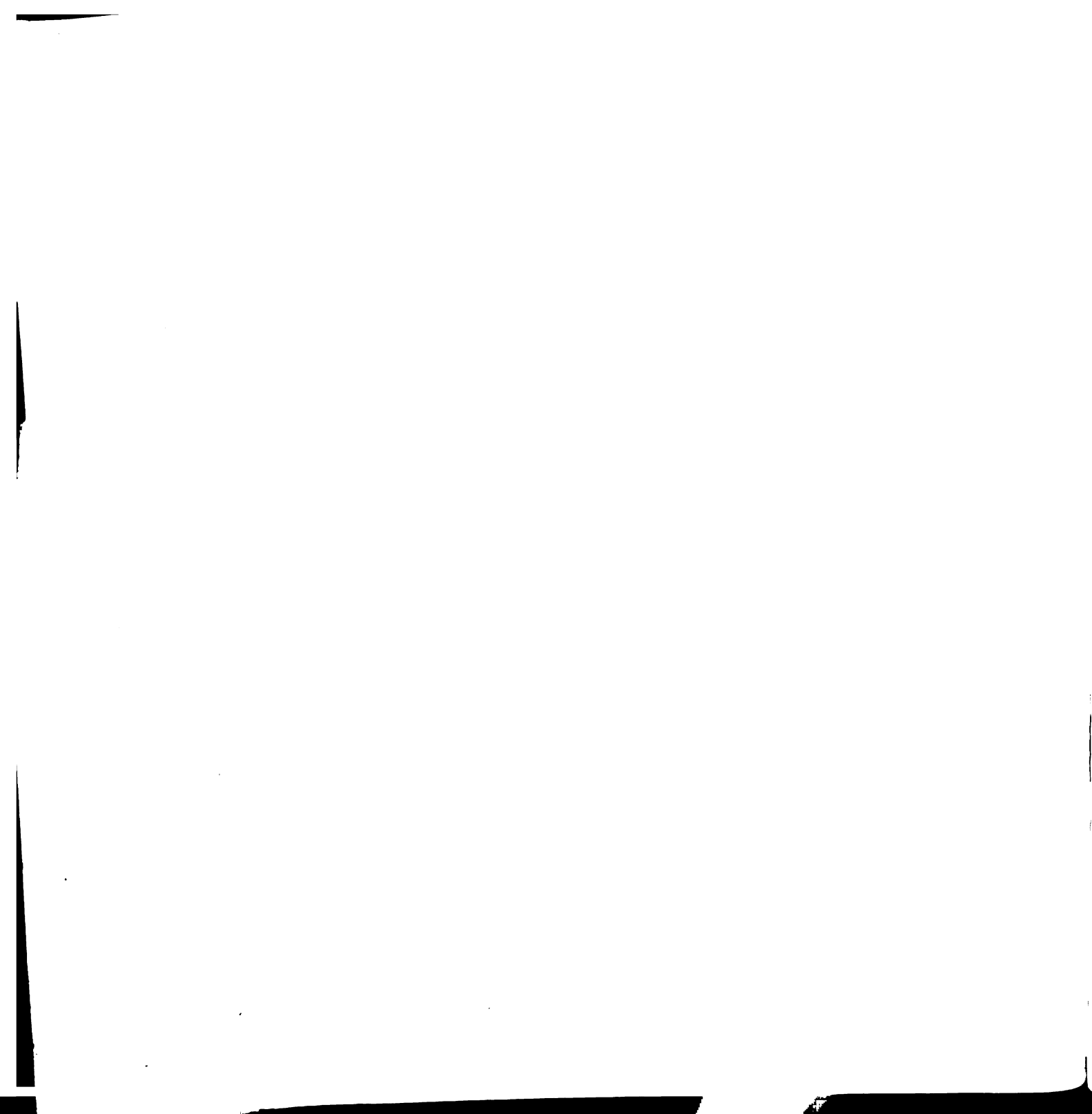
It should also be added that bisyllabic morphemes often reduce to monosyllabic morphemes in frequently used compounds in SWM.

Mende	njolá	'potato leaf'	from Me	yowoó	'sweet potato'
					láwá 'leaf'
Mende	kəŋá	'box'	from P-SWM	*kəla+ŋəla	'box'
		(kəla+ŋəla appears to be a reduplicated morpheme)			

Some of these class 3 nouns may not be true compounds but borrowings. Because they have the tonal configuration of a nominal compound, they represent an acceptable tonotactical sequence in SWM and could, therefore, have been borrowed without tonal modification.

Whatever the explanation of the origin of class 3 nouns, they do not, as far as can be determined, have cognates in any of the northern Mande languages and, therefore, must have been acquired since Northern-Western Mande split into Southwestern and Northern Mande.

At the time of this split, then, there were two tone classes, class 1, (cV)cV(ŋ) and class 2, (cv)cv(n).



The development of the third tonal class is closely linked to the tonal patterns of nominal compounds. Either the class 3 tonal patterns represent fossilized compounds, or the tonal patterns of nominal compounds made possible the acquisition of nouns with a class 3 tonal pattern. Correspondingly, the establishment of class 3 nouns with three phonetic tone levels paved the way for class 4 nouns, c'vc'v, and class 5 nouns, c'vc'v, with true low tones. Figure 12-2 summarizes the development of the five SWM tone classes from Proto-Northern-Western Mande.

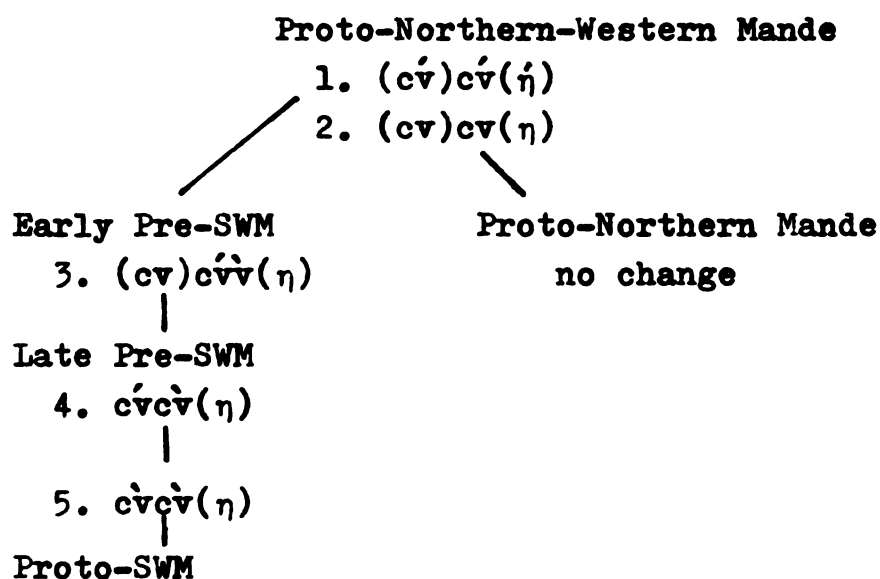


Figure 12-2: The development of Northern-Western Mande tone classes.

Footnotes

Chapter 12

1. The basis for the consonant reconstructions of these Proto-SWM nouns is beyond the scope of this thesis. However, the basis of this reconstruction is provided in Dwyer (1973).
2. Welmers (personal communication 1973) has stated the following: "I now believe that Kpelle galà and Loma gala 'God' is ultimately from 'allah 'God', but via Mandekan. I have no other conscious suspicions of Arabic origin. Possibly other languages (e.g., West Atlantic, Kru), are the culprits - which I suspect for Kpelle gèlì 'Diana monkey'."

Chapter 13

The Diachronic Development of Loma Tone

13.0 The historical emergence of Loma from its most immediate ancestor, Proto-Bandi-Loma (PBL), involved a most interesting and unique event, Tonal Inversion, a process that reversed the categorical values of the feature [high] .

Tonal Inversion

[α high] > [- α high] / Loma

As a result of this process, the tones of Loma rules and underlying forms became the inverse of those of PBL; thus, PBL tones: high, low and rising correspond to Loma tones: low, high and falling, respectively.

The claim of tone reversing has also been made for Chiluba of the Republic of Zaire. This reversal is by no means complete, for as Van Spaandonk (1971) points out, the tones of Chiluba pronouns are the same of those of their cognates in related languages. Using this clue, Van Spaandonk further demonstrated that historically this apparent reversal involved tone copying rules similar to those found in Southwestern Mande. These rules extend the tones of subsequently deleted prefixes onto the tones

of the nouns which are said to have inverted tones. Therefore, Chiluba cannot be considered to be a language which has undergone tone reversal.

Loma, on the other hand does show evidence of having undergone tone reversal. All of the tones of the Loma rules and base forms are the inverse of Proto-Bandi-Loma. The tonal reversal of Loma can be demonstrated by comparing the inverted forms of the rules and base forms of PBL with rules and base forms of their Loma cognates.¹

13.1 The Diachronic Inversion of Loma Tone Rules.

The following comparison of the tone rules of PBL and inverted PBL and Loma demonstrates how the rules of PBL and Loma are related through Tone Inversion.

	PBL	Inverted PBL	Loma
1	*Lowering	*Raising	Raising
2a.	*1st High Tone Copy	*1st Low Tone Copy	Low Tone Spread
2b.	*High Loss	*Low Loss	Low Loss
3a.	*Low Loss	*High Loss	High Loss
4.	*Low Tone Adv.	*High Tone Adv.	High Tone Adv.
5.	*Weak Suf. Rules	*Weak Suf. Rules	Weak Suf. Rules
6.	*Downdrift	*Downdrift	Downdrift
7.	*Cont Red	*Inverted Cont Red	(no rule)

13.11 The Raising Rule

The inverted PBL Raising rule is identical to the Loma Raising rule; both rules raise the tones of the second constituent of nominal compounds and possessed alienable nouns.

13.12 Low Tone Spread

Loma incorporates, in its Low Tone Spread rule, the effects of both the low-tone copying rules of inverted PBL. The Loma rule spreads a morpheme-final non-high tone onto all of the syllables of the next morpheme. The inverted PBL low-tone copying rules only advance a non-high tone two syllables. Also the Loma Low Tone Spread rule has a broader grammatical range of application. It operates across all morpheme boundaries within nominal phrases. The PBL version is limited to nominal compounds and alienable possessives. Because these rule changes are broadenings, they are natural diachronic developments.

With the combining of the two tone-copying rules, the PBL Low Loss rule becomes absorbed. Also the PBL High Loss rule corresponds to Loma Low Loss. The Loma Low Loss rule follows the Loma Low Tone Spread rule.

13.13 High Tone Advancement

The Loma High Tone Advancement rule differs from its inverted PBL cognate in two ways. The inverted PBL version advances a high tone one syllable to the right; the Loma version advances a morpheme-final high tone onto the next morpheme for as many syllables as possible as long as it does not raise a non-high tone before a high tone. The inverted PBL version does not apply to alienable possessives; the Loma version applies across all noun-phrase internal morpheme boundaries. Both Loma developments are broadenings and, therefore, natural and anticipated

developments from the PBL version.

13.14 Weak Suffix Rules

Little can be said about the weak suffix rules because, while they all concern weak suffixes, they do not show a systematic development. In chapter 10, the numerous weak suffix rules were attributed to a common universal pressure on adjacent vowels bearing different tones.

13.15 Downdrift

Since the Downdrift rule in all of the Central SWM languages is symmetrical with respect to the feature high, its tonal inverse produces the same effect.

Downdrift (C)

$[\alpha\text{high}] \rightarrow [+lowered] / [-\alpha\text{high}](c)___$

Inverted Downdrift

$[-\alpha\text{high}] \rightarrow [+lowered] / [\alpha\text{high}](c)___$

13.16 Contour Reduction

There is no evidence to support the existence of a Contour Reduction rule in Loma.

13.2 The Diachronic Development of Loma Base Forms

The following comparison of PBL, inverted PBL, and Loma tonal types demonstrates how PBL and Loma are related through Tonal Inversion.

PBL		Inverted PBL		Loma		Gloss
1w *(ćv)ćv	séle	*(c_v)c_v	sele	(c_v)c_v	sele	medicine
1s *(ćv)ćṽ	kóṣíí̃	*(c_v)c_ṽ	koṣií̃	(c_v)c_ṽ	komí̃	bee
2w *(c_v)c_ṽ	lóbóñ	*(ćv)ćṽ	lóbóñ	(ćv)ćṽ	lóbóñ	bush
2s *(c_v)c_ṽ	masá̃	*(ćv)c_ṽ	másañ	(c_v)c_ṽ	masañ	chief
3w *(c_v)ćv	ṣeté	*(ćv)c_v	ṣete	(c_v)c_v	ṣete	pestle
3s *(c_v)c_ṽ	ṣalí̃	*(c_v)c_ṽ	ṣalíñ	(c_v)c_ṽ	ṣalíñ	thorn
4w *ćvćv	káíí	*cvcv	kali	cvcv	kali	hoe
5w *cvcv	bélé	*ćvćv	bélé	no examples ²		trousers

This comparison reveals that the morpheme-final tones of inverted PBL and Loma are identical. The lack of a consistent correlation with inverted PBL and Loma non-final tones is inconsequential. Loma non-final tones are indeterminable on the basis of internal Loma evidence because of the nature of the tone-spreading rules. In chapter 7, these non-final tones were arbitrarily assigned values which "harmonized" with the tone of the final syllable of the morpheme. This is why the non-final tones of Loma class 2s, 3w, and 3s do not agree with those of inverted PBL.

In addition to the above "true cognates," Loma has a short list of quasi-cognates. Quasi-cognates are morphemes whose segments can be derived from PBL, but their tones cannot. Below are some examples:

	PBL	Inverted PBL	Loma	Gloss
lw	tókpo	təkpo	tókpo	palm tree
lw	kpíndí	kpindi	kpídiŋ	night
3w	fófo	fófo	fófoŋ	field
3s	ɣulúŋ	ɣúlun	ɣuluŋ	cobra

Though the evidence is by no means clear, one possible explanation for the exceptional tonal behavior of these nouns is to assume that they do not take the high-toned \acute{n}_2 - noun-phrase prefix when they appear as the first noun in a noun phrase, as do true tonal cognates. This would account for the fact that they do not have a cvcv tonal pattern in that position, since High Tone Advancement would not have applied. Since not taking the prefix \acute{n}_2 - is a characteristic of borrowings in SWM, this might further lead one to suspect that these exceptions were borrowed into Loma from Bandi. Furthermore, the tonal patterns of these quasi-cognates are very similar to obvious borrowings in Loma, such as the following:

kɔ́fí	coffee
kíci	kitchen
dobá	dumboy, a kind of food

These obvious borrowings also retain their underlying tones when they occur noun-phrase initially, apparently because these nouns also have no \acute{n}_2 - prefix, and, consequently, High Tone Advancement does not apply.

13.3 The Diachronic Development of Loma Possessive Pronouns

Loma possessive pronouns also have inverted tonal values from those of Proto-Bandi-Loma. The following comparison of the corporal possessive pronouns of PBL, Inverted PBL, and Loma demonstrates how PBL and Loma are related through Tonal Inversion.

PBL	Inverted PBL	Loma	Gloss
ń-	n-	n-	1st sg
í-	i-	e-	2nd sg
n-	ń-	ń-	3rd sg
nií-	nii-	dii	1st pl in
muú-	múu-	gii	1st pl ex
wú	wu	wo	2nd pl
tíi	tii	tii	3rd pl

The tonal patterns of the Loma corporal possessive pronouns correspond perfectly to those of Inverted PBL, even in the first person plural, where the pronouns do not appear to be cognate and in the second person where there appears to have been a vowel shift. The derivation of Loma alienable possessive pronouns is given in 7.2.

In this chapter, all of the Loma rules and cognate base forms, including the possessive pronouns, have been shown to be derivable from PBL using only Tonal Inversion, a process which inverts the value of the tone feature [high], thus proving that Loma is a language which has undergone Tonal Inversion.³

Footnotes

Chapter 13

1. The tonal development of the Gizima dialect of Loma is discussed in 7.6.
2. Due to an oversight, I collected no examples of Loma class 5 nouns during my field work.
3. A rule which reverses the value of every occurrence of a feature is a rare event, and it is very tempting to speculate why and how Loma could have developed such a process. And while I am not prepared to speculate on this subject, it is worth noting that the Tonal Inversion of Loma bears a striking similarity to tjilwiri, the ritual language of the Walbiri of Central Australia. Furthermore, according to Hale (1971:473), "Walbiri men sometimes refer to tjiliwiri as 'up-side-down Walbiri'." To speak tjiliwiri according to Hale (1971:473), one replaces "each noun, verb, and pronoun of ordinary Walbiri by an 'antonym'. Thus, for example, if a tjiliwiri speaker intends to convey the meaning 'I am sitting on the ground', he replaces 'I' with '(an)other', 'sit' with 'stand', and 'ground' with 'sky." Is it possible that Loma is linked with Porro, a secret society found throughout Sierra Leone and Liberia? Furthermore, is the spread of Porro linked with the Mane invasions of Sierra Leone and with the rise of Central SWM (see Rodney 1967)?

Chapter 14
The Diachronic Development of
Southwestern Mande Nasals

14.0 Proto-Southwestern Mande has four types of underlying nasals which are responsible for the development of consonant mutation in Southwestern Mande: \acute{n} - '1st(sg)', \grave{n}_1 - '3rd(sg)', \grave{n}_2 - 'prerference' and morpheme-final nasals. In addition, there are well-attested morpheme-initial and morpheme-medial nasals.

The internal evidence of modern Kpelle, and presumably Proto-SWM, supports the existence of these nasals (see 8.1). But as Southwestern Mande developed, this internal evidence diminished until it became so weak that the synchronic existence of these nasals can be questioned. When the synchronic evidence no longer supports these nasals, the nasals are replaced by a diacritic feature. While there are several possible grammars which use a diacritic feature instead of these underlying nasals, the one given below can be taken as representative of all such grammars.

One possible diacritic alternative would include a weakening rule which weakens strong (base) initial consonants (e.g., $k \rightarrow \text{ɕ}$ and $nd \rightarrow l$) except when

the initial consonant is preceded by a morpheme which contains the feature [no weakening]. This feature replaces all of the underlying nasals of the earlier and more natural analysis.

This chapter traces the historical development of these nasals to see if and when they are replaced by a diacritic feature. In Southwestern Mande, there are several developments, both tonal and consonantal, which can only be understood had underlying nasals (rather than diacritic features) existed in the grammar. Figure 14-1 presents a summary of the development of these four nasals.

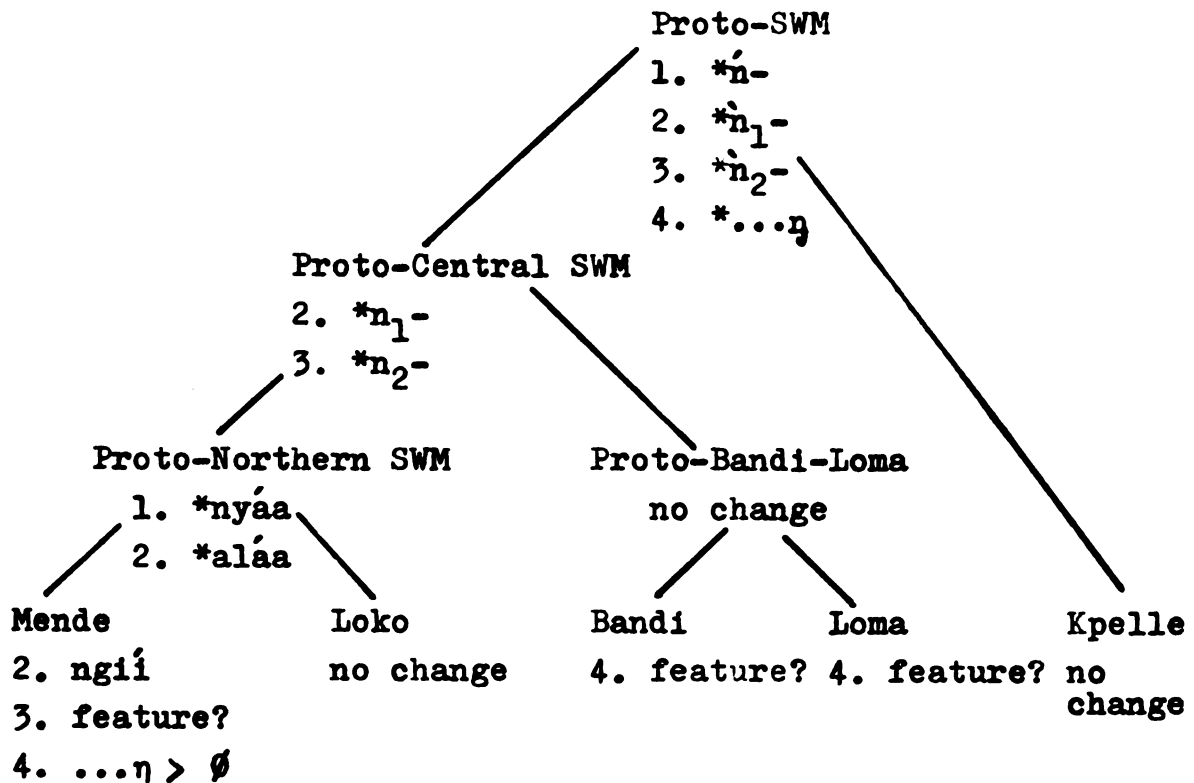


Figure 14-1: The development of the SWM nasals: *n̥-, *n̥₁-, *n̥₂-, and *...ŋ.

14.1 Proto-Southwestern Mande

Modern Kpelle very nearly represents the way these four types of nasal consonants appeared in Proto-SWM and, therefore, can be used to demonstrate their existence in Proto-SWM. In modern Kpelle, both \underline{n} - '1st(sg)' and morpheme-final nasals appear on the surface:

	Underlying	Surface	Gloss
Kpelle	\acute{n} -pólù	\acute{m} -bólù	my back
	kómíŋ	kómíŋ	bee

The validity of the other two nasals which cause initial consonant alternation, \underline{n}_1 - '3rd(sg)' and \underline{n}_2 - 'prerference', can be established on the basis of their phonological similarity to \underline{n} - '1st(sg)'. Like \underline{n} -, the two low-toned nasals cause the voicing of a following obstruent and fuse with a heavy consonant. Only the low-toned nasals, however, cause gemination. These arguments are presented in more detail in (3.2).

The prefix of prerference, $*\underline{n}_2$ -, may be added to any noun belonging to one of the five Proto-SWM tone classes. However, when it is added to a morpheme which has an underlying strong initial consonant, such as the class 5 noun $*\underline{bb}\grave{e}r\grave{e}$ 'trousers', no surface alternation results.

	Underlying	Surface	Gloss
Kpelle	$\underline{bb}\grave{e}r\grave{e}$	$\underline{bb}\grave{e}r\grave{e}$	trousers
	\underline{n}_2 - $\underline{bb}\grave{e}r\grave{e}$ -í	$\underline{bb}\grave{e}r\grave{e}$ -i	the trousers

In Central SWM, this morpheme ceases to carry the meaning 'prerference' and is added to all phrase-initial native SWM nouns with no apparent change in meaning.

14.2 Proto-Central Southwestern Mande

Two consonantal rule developments in Central SWM obscured the surface appearance of these kinds of nasals. Due to the Nasal Expansion rule (see 3.2), **...ŋ* became **...ng* when followed by a vowel, thus creating the strong~weak suffix alternations of *ngí~í* 'definite' and *nga~a* 'plural₁'. and obscuring the surface appearance of **...ŋ*. This development, when coupled with the expanded use of the definite suffix, resulted in the absence of a surface realization of this nasal as a simple nasal consonant.

A second development in Central SWM also served to obscure the existence of these four nasals; this was the broadening of the Gemination rule to include all four of these nasals, rather than just the low-toned nasals (*ṅ₁-* and *ṅ₂-*) of Proto-SWM and Kpelle. As a result of this broadening, both **ṅ-*, which is always followed by a consonant, and **...ŋ* when followed by a consonant undergo the Gemination rule and also do not appear on the surface as simple nasals in Central SWM. Thus, when these two developments are taken together, none of the underlying nasals of Proto-SWM appear on the surface of Central SWM as simple nasal consonants.

Gloss	Kpelle	Proto-SWM	Proto-CSWM
my back	m-bólù	*m-pólu	*p-pólu
your back	í-pólù	*í-pólu	*í-wólu
his back	b-bólù	*p-pólù	*p-pólu
old house	b-béle+pólò-i	*p-péle+pólò-í	*p-éle+bólo-í
old bee	g-gómim-pólò-i	*k-kómim+pólò-í	*k-kómip+pólò-í

Each of these diachronic developments; Nasal Expansion (...ŋ > ...ng) and the broadening of the Gemination rule, can be understood if and only if these nasals (*n-, *n₁-, *n₂-, and *...ŋ) had not yet been replaced synchronically by the diacritic feature [no weakening]. How could a diacritic feature explain the development of the ngí~í definite suffix alternation? Why would the Gemination rule broaden its environment to include high-toned nasals and morpheme-final nasals in addition to morphemes marked [no weakening]? Thus from the diachronic evidence, it can be seen that the Proto-SWM nasals, *n-, *n₁-, *n₂-, and *...ŋ had not been replaced by a diacritic feature in the synchronic grammar of Proto-Central SWM.

14.3 Proto-Northern Southwestern Mande

The development of the Northern SWM alienable possessive pronouns further obscured the underlying nasal system. In addition to the replacement of *í- by *bí- 'you(sg)' (see Figure 9-2), the first person singular pronoun *n- was replaced by *hyáa-, and the third person singular pronoun *n₁- was replaced by *aláa-. Following this development, only *n₂- and *...ŋ of the four

original SWM nasals remained in Northern SWM.

Despite the obscure appearance of these remaining nasals, $*\underline{n}_2-$ and $*\underline{...n}$, two separate tonal developments require the presence of the noun-final nasal $\underline{...n}$ in Loko. One of these is the blocking of the Second High Tone Copying rule by the non-high-toned nasal of class 3 nouns, $\underline{cvcv'v(n)}$ (see 5.3). The other concerns the failure of the High Tone Displacement rule to reduce the rising tone of class 2 nouns (see 11.4). Each of these developments is a natural consequence of a morpheme-final tone-bearing nasal. Had this nasal been replaced by a diacritic feature, these developments would appear unnatural, unrelated, and unexplainable. Therefore, Proto-Northern Southwestern Mande and Loko most likely have morpheme-final nasals in their underlying structures.

Mende lost its final nasals, as has already been mentioned (11.4). This loss permits a restatement of the distribution of strong and weak initial consonants. Strong initial consonants occur noun-phrase initially; weak initial consonants occur noun-phrase internally. Since this statement no longer requires \underline{n}_2- or, for that matter, its proposed replacement, [no weakening], none of the four types of Proto-SWM nasals is crucial to Mende phonology. However, an underlying \underline{n}_2- , unlike the diacritic feature [no weakening], provides an explanation for one oddity about Mende phonology: why the syllabic nasal of the Mende prenasalized consonants

(mb, nd, nj, and ng) bears a non-high tone, rather than a high tone (e.g., $\bar{m}b\acute{o}w\acute{e}-\acute{i}$ 'the knife' and not $*\bar{m}b\acute{o}w\acute{e}-\acute{i}$). Historically, this non-high tone comes from the noun-phrase prefix \underline{n}_2- (Me: $\bar{m}b\acute{o}w\acute{e}-\acute{i}$ PSWM: $*\bar{n}_2-\acute{b}o\acute{a}-\acute{i}$ 'the knife'). Were an underlying \underline{n}_2- absent in Mende, this oddity would not be as easily explained, although this argument cannot be taken to mean that Mende must have an underlying \underline{n}_2- prefix.

14.4 Proto-Bandi-Loma

While the tonal developments in Loko provide evidence of the synchronic retention of noun-final nasals ($*\dots\eta$) in Proto-Northern SWM, the tonal developments of Bandi and Loma provide evidence of the synchronic retention of the prefixes $*\underline{n}-$, $*\underline{n}_1-$ and $*\underline{n}_2-$ in Proto-Bandi-Loma. In Bandi, the tones of the nasal prefixes $\underline{n}-$ '1st(sg)' and \underline{n}_1- '3rd(sg)' are necessary to derive the surface tones of the nouns in the first and third singular corporal possession. The nasality of these prefixes accounts for the strong initial consonant of these nouns. In addition to these arguments, which also apply to Loma, one can add the argument that the tonal inversion of these forms in Loma can only be derived if the first and third person singular possessive pronouns are tone-bearing. This can be seen in the following comparison of Bandi and Loma corporal possessives:

	Bandi		Loma		
	Underlying	Surface	Underlying	Surface	
my	ń-ko.oó-í	kó.o-í	n-kó.óoŋ-i	ko.og-í	belly
your	í-ko.oó-í	í-wó.o-í	e-kó.óoŋ-i	e-wo.og-í	belly
his	n-ko.oó-í	ko.o-í	ń-kó.óoŋ-i	kó.óg-í	belly
my	ń-kǎwǎ-í	kǎwǎ-í	n-kǎwǎ-i	kǎwǎ-i	foot
your	í-kǎwǎ-í	í-ǎwǎ-í	e-kǎwǎ-i	e-wǎwǎ-i	foot
his	n-kǎwǎ-í	kǎwǎ-í	ń-kǎwǎ-i	kǎwǎ-í	foot

Had a diacritic feature replaced these nasals, the first and third singular pronouns would have had no segmental unit in which to register tone. Without tone prefixes, the tonal patterning of Bandi and Loma corporal possessives can have no natural explanation. Also, without these tone-bearing segments, the tonal inversion of Loma corporal possessives cannot be derived. Again, the nasality of these pronouns facilitates the derivation of the following strong initial consonants.

These arguments also extend to the prefix \underline{n}_2 -. In Bandi, when a noun is preceded by \underline{n}_2 -, the first high tone of the noun is lowered. In Loma, when a noun is preceded by this prefix, which because of Tonal Inversion has a high base tone, the High Tone Spreading rule copies the high tone of the prefix onto the noun. In both Bandi and Loma, \underline{n}_2 - precedes a noun only phrase-initially.

Bandi		Loma		
Underlying	Surface	Underlying	Surface	Gloss
n-pélé-í	pele-í	ń-pelɛ-i	pélé-í	the house
n-pelee-i	pele-í	ń-pélee-i	pélé-í	the road

More recently acquired Bandi and Loma nouns do not take the \underline{n}_2 - prefix, and, consequently, in the phrase-initial position, their surface and underlying tones are not displaced.

Bandi			Loma		
Underlying	Surface	Gloss	Underlying	Surface	Gloss
pániŋ-í	pániŋ-í	the pan	kɔ́fíŋ-i	kɔ́fíŋ-í	the coffee
lambón-í	lambóng-í	the lamp	baza-i	baza-i	the rice bird

Finally, borrowed morphemes in Bandi which begin with a voiced or weak consonant do not strengthen while those which begin with a strong consonant weaken.

Bandi			
Base	Gloss	Definite	my _____
kɔ́híŋ	coffee	kɔ́híŋ-í	ní+wɔ́híŋ-í
súkulu	school	súkulu-í	ní+húkulu-í
lambón	lamp	lambóng-í	ní+lámbong-í

Because borrowed strong initial consonants do weaken in the appropriate environments while weak initial consonants do not strengthen, the process which creates the initial consonant alternation is no longer viewed as fortition in Bandi but rather is considered as weakening. This situation, the inverse of the historical process, supports an analysis which uses diacritic features.

In Bandi, recently borrowed morphemes may be assigned to either the ngi or the i class:

i Class		ngi Class	
jíminga-íi	banana (< Jamaica)	páning-í	pan
nómba-íi	number	kǎhǐng-í	coffee
dáimu-íi	flashlight (Diamond, a brand name)	lambóng-í	lamp

Whatever the strategy for class placement, it is not governed by nasality. If nasality does not govern placement of newly acquired Bandi nouns into the i class or the ngi class, then it seems hardly likely that the the distinction is marked by ...ŋ.

Thus in Bandi, while the synchronic evidence supports an analysis with the underlying nasal prefixes: n̂-, n̂₁-, and n̂₂-, it also suggests that the underlying historical nasal *...ŋ in Bandi has been replaced by a diacritic feature.

14.5 Summary

Thus, the underlying nasals: *n̂-, *n̂₁-, *n̂₂- and *...ŋ, provide the basis for the understanding of a number of diachronic consonantal and tonal developments in Southwestern Mande. Also, the synchronic evidence seems to suggest the preservation of these nasals in certain contexts and the loss of these nasals in others. For example, an underlying ...ŋ in Loko helps to explain why strong-conditioning nouns are different from weak-conditioning nouns and why Second High Tone Copying is blocked under certain conditions. On the other hand,

the Bandi evidence seems to argue for the replacement of this historical nasal by a diacritic feature. Conversely, the synchronic evidence in both Bandi and Loma seems to support underlying nasal prefixes while that of Mende and Loko does not. Evidence of varying degrees of strength supports the synchronic presence of the nasal prefix *n₂- in the modern SWM languages.

Chapter 15

Summary

Listed below are the topics and conclusions which I believe to be important contributions to the fields of African linguistics, historical linguistics, and general linguistics.

1. The use of the feature [lowered] in describing down-drift and downstep (2.2 and 2.3).
2. The use of [length] in describing short contour tones (2.4).
3. The description of the development of Southwestern Mande consonant alternations as a process involving nasal consonants, natural rules, and rule simplifications (3.2).
4. The treatment of tone-copying rules in Mende and Loko as contour-producing, rather than feature-changing rules (4.5 and 5.6).
5. The description and analysis of the tonal patterns of Loko, Bandi, and Loma (Gbunde) nominals and the discussion of the tonal relationships between the Gbunde and Gizima dialects of Loma (chapters 5, 6, and 7).

6. The analysis and comparison of the various Southwestern Mande tone rules, and the reconstruction of their Southwestern Mande prototypes based on the assumptions about rule changes (chapters 9 and 10).
7. The comparison and reconstruction of Southwestern Mande prototypes of the five native SWM tone classes, including the establishment of the fact that class 5 nouns must have existed in Proto-SWM and not simply in Kpelle (chapter 11).
8. The tonal relationship between Southwestern Mande and Northern Mande and the demonstration of how a language with two tonal levels (high and non-high) can develop a third tonal level through the acquisition of morphemes with true low, [-high, +low], tones (chapter 12).
9. The description of the development of Loma from its most immediate ancestor, Proto-Bandi-Loma, through a process of Tonal Inversion (chapter 13).
10. The assumption of the existence in Proto-Southwestern Mande of the nasals, $*\underline{n}$ -, $*\underline{n}_1$ -, $*\underline{n}_2$ - and $*\underline{...}\eta$, in order to explain a number of Southwestern Mande tonal and consonantal developments (chapter 14).

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