

CONSONANT MUTATION IN MENDE

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ABSTRACT

CONSONANT MUTATION IN MENDE

By

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Mende consonant mutation appears to represent a challenge to the current generative theory of phonology. The mutation of one consonant to another, conditioned by the grammatical environment, appears on the surface to be haphazard and unsystematic. This thesis investigates the problem of determining whether or not consonant mutation can be treated adequately in a generative phonological framework.

This thesis begins with a general description of those aspects of phonology and grammar of Mende which are relevant to the problem. Secondly, the problem is defined in detail and a tentative, but inadequate description is proposed. Data from other languages, either closely related to Mende, or having similar consonantal behavior, are then examined and a reasonably satisfactory explanation and description of consonant mutation is found. This is followed by a reinforcement of the analysis by introducing a description of consonant mutation in Kpele, a related South-western Mande language.

It was found that consonant mutation in Mende was the result of the conditioned presence and absence of a low tone nasal prefix, /N-/, and that each mutation was the

natural consequence of this situation. Those mutations which did not exactly fit this scheme, were shown by comparative data to be the result of subsequent sound shifts.

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TABLE OF CONTENTS

I.	INTRODUCTION	
1.1	Introduction	... 1
1.2	Location	... 1
1.3	Documentation	... 1
1.4	The Problem	... 2
II.	SYSTEMATIC PHONETICS	
2.1	Introduction	... 5
2.2	Consonants	... 5
2.3	Vowels	... 6
2.31	Introduction	... 6
2.32	Length	... 6
2.33	Vowel Mutation	... 7
2.34	Consonant Deletion	... 8
2.35	Vowel Assimilation	... 8
2.4	Tone	... 9
2.41	Introduction	... 9
2.42	Terrace Tone Systems	... 10
2.43	Tone and Mende noun classes	... 11
2.44	The Spears transcriptional system	... 13
2.45	Tone Mutation	... 16
2.46	A sequential analysis of tone	... 17
III.	CONSONANT MUTATION PRELIMINARIES	
3.1	Introduction	... 22
3.2	Grammatical Environments for Consonant Mutation	... 23
3.21	Possessives	... 23
3.22	Compounds	... 24
3.23	Adjectivals	... 25
3.24	Locatives	... 25
3.25	Verb Phrases	... 25
3.3	Exceptions	... 26
3.31	Nonmutating Consonants	... 26
3.32	The exception of /d/	... 27
IV.	INTERNAL EVIDENCE	
4.1	Preliminaries	... 29
4.2	Clear Cases	... 29
4.3	/t/, /s/ and /ng/	... 30
4.4	Remaining unclear cases	... 32
4.5	Inadequacies of the proposed description	... 34
4.51	Lack of Uniqueness	... 34
4.52	Lack of generality	... 34
4.6	Other sources of data	... 35

V.	COMPARATIVE EVIDENCE	
5.1	Consonant Mutation in West Atlantic	... 37
5.2	Mutation Grades in West Atlantic	... 38
5.3	The Original System	... 39
5.4	Subsequent Changes	... 39
5.41	Denasalization	... 39
5.42	Softening and Voicing	... 40
5.43	Reduction	... 40
5.44	Liquids and glides	... 41
5.45	Voiced stops and nasals	... 41
5.46	Summary of the West Atlantic data	... 42
5.5	Similarities between West Atlantic mutation and Southwestern Mende mutation	... 42
VI.	CONSONANT MUTATION AND MENDE	
6.1	Introduction	... 45
6.2	The prefix system	... 46
6.3	The Mende prefix	... 47
6.4	The prefix /N-/	... 47
6.5	The explanation for consonant mutation in Mende	... 47
6.6	The lexical representation of Mende consonants	... 48
6.7	The rules for consonant mutation in Mende	... 48
6.8	Application of the rules	... 49
6.9	Summary	... 50
VII.	REINFORCEMENT OF THE PREFIX HYPOTHESIS	
7.1	The problem	... 52
7.2	Kpele mutation	... 52
7.3	Kpele mutation and Mende lexical representation	... 53
7.4	Phonological differences	... 54
7.41	/s/ and /ʃ/	... 54
7.42	Mende /mb/ to /b/	... 55
7.43	The status of Mende /p/ to /w/	... 55
7.44	/f/ and /v/	... 56
7.5	Equivalence of transcription	... 56
7.6	Rules for Kpele mutation	... 57
7.7	Application of the rules	... 57
7.8	Summary	... 59
VIII.	CONCLUSIONS	
8.1	Introduction	... 60
8.2	The regularity of the Mende mutational system	... 60
8.3	Summary of consonant mutation	... 60
8.4	The use of comparative data	... 61
8.4	Further areas of investigation	... 62

LIST OF FIGURES

1. Subclassification of the Mande languages
2. Mende Consonants
3. Mende Vowels
- 4a. The fronting of /a/
- 4b. The fronting of /u, o and ɔ/
5. Definite and indefinite forms of /tālā/
6. Crosby's noun classes
7. Examples of Crosby's noun classes
8. Spears' base tonal forms
9. An illustration of the Spears system
10. Illustration of tone mutation
11. Mende mutating consonants
12. Type three possessives
13. Type two possessives
14. Type one possessives
15. Compounds
16. Adjectivals
17. Locatives
18. Verb phrases
19. Clear cases of consonant mutation
20. */s/ in Kpele, Loma and Mende
21. Expanded list of clear cases
22. Consonant mutation in Biafada
23. Mutation Grades in West Atlantic
24. Regularized Mutation Grades in West Atlantic
- 25a. Modification of the voiceless stop series
- 25b. Softening, voicing and reduction
26. Liquids and glides
27. Voiced stops and nasals
28. Mutation in Southwestern Mande
29. The lexical representation of Mende consonants
30. Application of the rules in nonmutating environments
31. Application of the rules in mutating environments
32. Kpele mutation
33. Kpele mutation and Mende lexical representation
34. Comparative data for /mb/
35. Kpele consonant mutation in nonmutating environments
36. Kpele consonant mutation in mutating environments

CHAPTER ONE

INTRODUCTION

1.1 Classification

Mende is a member of the Mande language subfamily of the Niger-Congo language family (Greenberg 1963:8). Welmers (1858:23) gives the following subclassification of the Mande Languages:

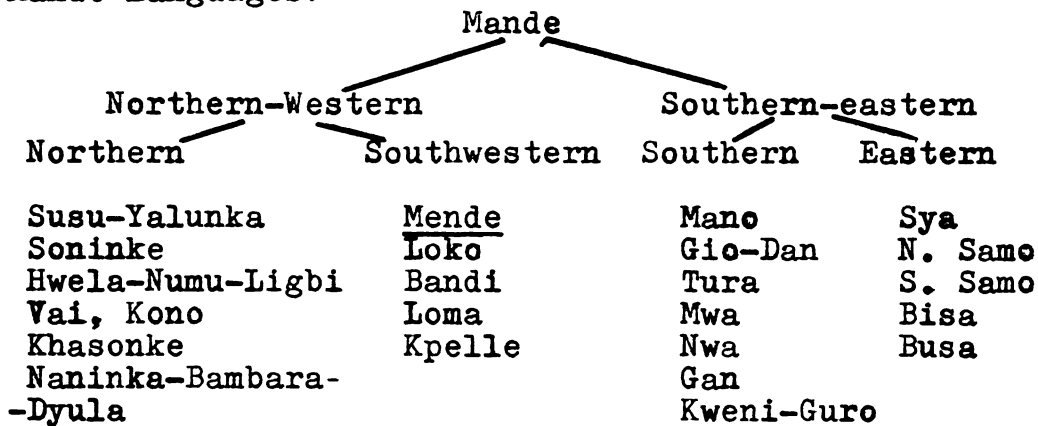


Figure 1: Subclassification of the Mande languages

1.2 Location

Mende is spoken in Sierra Leone "by an estimated 586,000 (1958) to 1,000,000 (1961) speakers" (Voeglin and Voeglin 1964:62).

1.3 Documentation

Mende has a long history of description, beginning with Migeod in 1908, The Mende Language. The other major works are as follows: 1935, Aginsky, A Grammar of the Mende

Language. 1944, Crosby, An Introduction to the Study of Mende. 1961, Brown, A Mende Grammar with Tone Innes, 1962, A Mende Grammar and 1963, The Structure of Sentences in Mende and 1967, Spears, Basic Course in Mende.

1.4 The Problem

Mende possesses some very interesting grammatically conditioned phonological alternations, which all of the above grammars have accurately described. One such type of alternation, the subject of this thesis, involves the conditioned alternation of a number of paired sets of initial consonants. One set occurs in possessive, compound and locative constructions, while the other does not. All of these mutating consonant pairs share a great number of phonetic similarities, so that most of these pairs are differentiated by only one or two distinctive features. However, as far as the phonetic representation is concerned, these features are not always the same from pair to pair. That is, as the system has been described in the past, each pair appears to have its own rules for alternation.

Descriptions of this sort, while adequately accounting for the data, suggest strongly that each of these mutations is independently motivated and not an individual manifestation of a general process of consonant mutation. By the standards of current linguistic theory, such a description is inadequate. First it fails to provide in so far as is possible a systematic and natural statement of mutation

to which all consonants are subject. Secondly it fails to show why consonant mutation takes the form that it does.

This thesis proposes to examine the problem of consonant mutation from the viewpoint of generative phonology (Chomsky and Halle 1968) with the aim of providing a systematic description in which each individual mutation is a consequence of a set of phonological rules which describe consonant mutation in general, as a part of Mende phonology. It is also hoped that it will be possible to provide an explanation of the basis of consonant mutation which could ultimately provide insight into the grammatical aspects of the problem.

The theoretical framework used, postulates both a systematic phonetic level and an abstract, but none-the-less natural underlying phonological representation, hereafter known as the lexical representation. This lexical representation is processed by a finite set of context sensitive phonological rewrite rules to produce a systematic phonetic representation, thus making it possible to represent a morpheme having several phonetic variants by a single lexical form. Both the systematic phonetic and lexical representations are given in terms of the proposed language universal distinctive features of Chomsky and Halle (1968) and the naturalness condition (Postal 1967: 53 ff.) that any segmental configuration of features be pronounceable.

Because this thesis is a preliminary investigation of

an aspect of Mende phonology rather than a complete and final description and for the general readability of the thesis, the presentation of rules which are based on the above principles will avoid feature notation as much as possible.

CHAPTER TWO

SYSTEMATIC PHONETICS

2.1 Introduction

The systematic phones in this description are considered the terminal units of the phonological component, that is, they are the output of the phonological rules. These phonetic segments as well as some of the other interesting phonological problems are presented briefly in order to give the reader a general understanding of Mende phonology and because frequently this information is pertinent to the problem of consonant mutation.

2.2 Consonants

The consonants identified by Ida Ward (1944:3) in Figure 2 below, are generally agreed upon in the literature.

	Labial	Dental	Palatal	Velar	Labio-Velar	Glottal
vl stop	p	t		k	kp	
vd stop	b	d		g	gb	
vl fric	f	s				h
vd fric	v					
vd affric			j			
nasal	m	n	n̥	ŋ		
prenasal	mb	nd	n̥j	ŋg	ŋgb	
liq. & glide	w	l	y			

Figure 2: Mende Consonants

In addition, there appear to be a number of labialized consonants: /m^w, ɲ^w, ɲg^w, s^w, t^w and h^w/. In the literature, these sounds are transcribed as the consonant followed by /u/. It is not clear whether the other consonants also have labialized counterparts.

/ɲgb/ does not occur morpheme initially.

/h/ "is always nasalized" (Ward 1944:3) yet other evidence seems to indicate that it is only sometimes nasalized. The available data are extremely vague on this point.

The above consonants do not present any difficulties from a phonetic point of view. All of them can be easily described in the present theoretical framework of distinctive features and none of them can be considered unusual for an African language.

2.3 Vowels

2.3.1 Introduction

The seven Mende vowels are given in the following figure:

	Front	Central	Back
High	i		u
Mid	e		o
Low	ɛ	a	ɔ

Figure 3: Mende Vowels

2.3.2 Length

Length will be treated in section 2.47 in conjunction with the description of tone.

2.33 Vowel Mutation

A definite construction is produced by suffixing the definite morpheme, usually $/-i/$ ¹ to the noun. If the noun ends in $/a/$, the $/a/$ is fronted to $/\epsilon/$ when followed by $/i/$:

$$a \longrightarrow \epsilon / _ i$$

Gloss	Lexical Representation	Phonetic (Indefinite)	Phonetic (Definite)
soup	hakpa	hakpa	hakpɛi
chief	maha	maha	mahɛi

Figure 4a: The fronting of $/a/$

If the noun ends in a back vowel and its final syllable begins with one of the following consonants:

$/l, n, nd, t, y, w$ but not $d/$

the back vowel is fronted and unrounded when followed by $/-i/$:

$$\begin{bmatrix} u \\ o \\ ɔ \end{bmatrix} \longrightarrow \begin{bmatrix} i \\ e \\ \epsilon \end{bmatrix} / \left\{ \begin{matrix} l \\ n \\ nd \\ t \\ y \\ w \end{matrix} \right\} - i$$

Figure 4b below is an illustration of the above rule. Tone has not been marked because it is not relevant to this illustration. For each vowel, there are two examples, one which will undergo vowel mutation and one which can not.

1. The $/\prime/$ over the $/i/$ will be explained in section 2.44.

Gloss	Lexical Representation	Phonetic (Indefinite)	Phonetic (Definite)
axe	konu	konu	konii
turtle	haku	haku	hakui
sun	folo	folo	folei
money	navo	navo	navoi
okra	bɔndɔ	bɔndɔ	bɔndɛi
tooth	ŋɔŋɔ	ŋɔŋɔ	ŋɔŋɔi

Figure 4b: The fronting of /u, ɔ and ɔ/

2.34 Consonant Deletion

There are a number of nouns of the form $C_1V_1C_2V_2$ in which C_2 is optional. In most cases this deletable consonant is a liquid or a glide, but there are a few exceptions. The reason for these deletions are unknown. When Spears (1967a:368) questioned his informants on these deletions on previously recorded tapes, he received the following comments:

"It sounds better if X is deleted."

"If I don't delete X, the sentence sounds too pedantic. It sounds like I am over-emphasizing. I would not talk that way to some people."

"I cannot delete X here because there could be an ambiguity"

"No Mende man talks that way!" (without deletions)

2.35 Vowel Assimilation

If C_2 is deleted, the definite is formed by suffixing /-v̌/ to the noun. The /-v̌/ then assimilates to quality of the preceeding vowel. Figure 5 is an illustration of the possible definite and indefinite forms of the Mende noun

/tălă/, 'tobacco'.

		<u>indefinite</u>	<u>definite</u>
with	C ₂	tălă	tălěí
without	C ₂	tăă	tăăá

Figure 5: Definite and indefinite forms of /tălă/

2.4 Tone

2.4.1 Introduction

There is currently no universally accepted system of tone marking and representation. Much of the problem lies in the fact that little is known about the nature of tone, what it is, how it is produced and how it is perceived. The best discussion of this problem to date is Lieberman (1967).

Another part of the problem concerns the number and kind of features. If we were not concerned with the universal nature of distinctive features, this would not be serious. It would only be necessary to identify features which would be useful for the description of one language and identify another set of features for another language and so on. In fact, this is what is currently being done. It is hoped that from these and other data, a general and universal set of tonal features can be uncovered. Presently, the problem remains, that if too many features are proposed, they may not be common to all languages, making it more difficult to state generalizations. If for example, a falling tone is given the features of plus high and plus contour, it will be difficult to talk about

the low component of this tone. If too few features are proposed, they may not be sufficient to describe the tonal characteristics of all the languages in the world.

One possible solution to this dilemma is to consider a complex tone to be of more than one tonal segment. Present theory seems to hold the view that tone is a feature of vowels and of no other phonetic segments. Secondly, it holds the view that all of the tonal information for any syllable should be placed in a single vowel segment. In Mende, there is some strong evidence to support a sequential representation of tone, which is presented in section 2.46.

2.42 Terrace tone systems

Mende has a terrace tone system, much like that of Igbo, Tiv and many other West African languages (cf. Welmers 1959). In a terrace tone system, there are three contrastive phonemic tones: "same", "downstep or step" and "low". Same and step are classified as non-low tones. All of these tones contrast following a non-low tone.

A same tone following a non-low tone will have a pitch identical to that of the preceding tone

A step tone following a non-low tone will have a pitch slightly lower than that of the preceding tone.

A low tone following a non-low tone will have a pitch much lower than that of the preceding tone.

This is the only environment in which all three tones contrast as well as the only environment in which "step"

and "same" contrast. In a phonemic, biunique system, there is only the contrast of low/non-low in the initial position, and the non-low part of the contrast may arbitrarily be assigned to either the step or the same tone. Likewise, a same tone can never follow a low. In this position as well, there is only a two way contrast of low/non-low and the value of this non-low may also be arbitrarily assigned to either step or same. In this case, step is generally preferred by traditional phonemicists because phonetically a non-low is always stepped following a low. That is, in any string of non-low, low, non-low, the second non-low will be lower in pitch than the first non-low.

2.43 Tone and Mende noun classes

A terrace tone transcription makes it necessary to separate Mende nouns into six different, ad hoc grammatical classes in order to predict the correct tonal variants of the definite and indefinite nominal constructions. In most cases, the definite form is produced by suffixing /-í/ to the noun stem. Without this suffix, the noun is indefinite. Figure 6 illustrates the tonal behavior of these six classes established by Crosby (1944). Figure 7 gives some examples of each of these classes.

Crosby's Class	Indefinite Stem	Definite Stem	Suffix
A1	low-step	low-step	-same
A2	low-step	low-low	-step
A3	same-same	same-same	-same
B1	low-step low (falling)	low-step	-step
B2	low-low	low-low	-step
B3	same-low	same-low	-step

Figure 6: Crosby's noun classes

Crosby's Class	Gloss	Indefinite	Definite
A1	stool	gbèhé'	gbèhéí'
	story	dòmi'	dòmíí'
A2	cotton	fàndé'	fàndèí'
	bamboo	kòní'	kòníí'
A3	raffia	ndúvú'	ndúvúí'
	house	pélé'	péléí'
B1	husband	hìníì'	hìníí'
	boy	ndòpòò'	ndòpòí'
B2	trousers	bèlè'	bèlèí'
	savannah	fònì'	fònìí'
B3	hoe	kálì'	kálìí'
	calling	tólì'	tólìí'

Figure 7: Examples of Crosby's noun classes.

In the above transcription, low tones have been marked with a / ` /, same tones a / ' / and step tones a / ' / over the vowel.

2.44 The Spears transcriptional system

Spears (1967a and b) introduced a system of transcribing Mende tone which could explain these variants in a more satisfying way. It is important to note that this system of transcription may be used to describe any terrace tone system, such as Camerounian Pidgin English, Ukele, Igbo, Tiv, etc. This kind of system is designed to eliminate the need for awkward and ad hoc grammatical classes whose only raison d'être is to account for a general, but (from an autonomous phonemic point of view) nonpredictable phonological variation such as the six classes needed by Crosby.

The Spears system posits four underlying or basic tones:

/ $\hat{v}$ /	'falling' (v represents any vowel)
/ $\check{v}$ /	'polarized'
/ $\acute{v}$ /	'high'
/ $\grave{v}$ /	'low'

The rules for translating the Spears tone marking system into a terrace tone system have the following conditions:

1. the rules are ordered
2. the rules are applied cyclically to the last syllable first, then the next last and so on.

Although the format of these rules resembles those used in generative phonology, they should not be interpreted as generative phonological rules.

$$\text{rule a} \quad \check{v} \rightarrow \left\{ \begin{array}{l} \check{v} \\ \check{v} \end{array} \right. / - \left\{ \begin{array}{l} \check{v} \\ \check{v} \end{array} \right\}$$

/v̌/ is polarized with respect to the following vowel,
low before high and high before low.

$$\text{rule b} \quad \hat{v} \rightarrow \left\{ \begin{array}{l} \hat{v} \\ \hat{v} \end{array} \right. / - \#$$

$$\text{rule c} \quad \acute{v} \rightarrow \acute{v} / \left\{ \begin{array}{l} \acute{v} \\ \acute{v} \end{array} \right\} _$$

The above rules are preceded by two blank filling rules. The first states that any tonally unmarked morpheme initial vowel has a low tone.

$$\text{rule d} \quad v \rightarrow \check{v} / \# _$$

The second rule, called "tonal extension" by Spears, states that any tonally unmarked vowel receives the tone of the preceeding marked vowel.

$$\text{rule e} \quad v \rightarrow \left[\begin{array}{c} \text{tone} \\ v \end{array} \right] / \left[\begin{array}{c} \text{tone} \\ v \end{array} \right] _$$

Here it is clear that Spears considers the falling tone to be a sequence of high followed by low, for he takes advantage of this rule by marking a high-low sequence within a morpheme as falling-unmarked.

All of the possible tone combinations of two syllable Mende morphemes are given in Figure 8. Note that a polarized tone can only be identified when it is on the final syllable of the morpheme, for it is only in this position that it could be followed by either a high or a low tone of the following morpheme.

S_1	S_2	low	high	falling	polarized
low		v v	v v̂	v v̂	v v̂
high		v̂ v	v̂ v	v̂ v̂	no example
falling		same as above	v̂ v̂	v̂ v̂	no example

Figure 8: Spears' base tonal forms

The output of these rules is a terrace tone system, and the rules for phonetic realization would at this point be identical to those of the Welmers system.

The use of this transcriptional system has eliminated the need for Crosby's six ad hoc grammatical classes which he found necessary to explain the tonal variants of Mende nouns. It is important to note that this system is not confined to the nouns, that with one exception, tone mutation (cf 2.45), it describes the tonal variants of all Mende morphemes.

Figure 9 below illustrates how the Spears system treats the tonological variation for which Crosby found it necessary to posit grammatical classes.

Crosby's Class	Gloss	Indefinite		Definite	
		Spears	Terrace	Spears	Terrace
A1	stool	gbɛhé	gbɛhé	gbɛhéí	gbɛhéí
	story	domí	dòmí	domíí	dòmíí
A2	cotton	fandě	fàndě	fanděí	fànděí
	bamboo	koní	kòní	koníí	kòníí
A3	house	péle	pélé	péleí	péléí
	raffia	ndúvu	ndúvú	ndúvuí	ndúvúí
B1	husband	hiní	hìníì	hiníí	hìníí
	boy	ndopô	ndòpòò	ndopôí	ndòpòí
B2	trousers	bele	bèlè	beleí	bèlèí
	savannah	foni	fònì	fonií	fònìí
B3	hoe	kâli	kálì	kâlií	kálìí
	calling	tôli	tólì	tôlií	tólìí

Figure 9: An illustration of the Spears system

2.45 Tone Mutation

Tone mutation takes place in a subset of those grammatical environments in which consonant mutation takes place, namely inanimate possession, noun compounding and adjective modification. It involves the elimination of the lexical tones in the second element of the above constructions and their replacement by a new tonal configuration, predictable from the immediately preceeding tone. If the preceeding tone is high or polarized, the first syllable of the second element will be high, if the preceeding tone is low or falling, the first syllable of the second element will be low.

The rule for tonal mutation in the Spears transcription system is as follows, where /s/ represents any arbitrary syllable:

$$s_1(s_2)(s_3)\dots(s_n) \rightarrow \left\{ \begin{array}{l} \acute{s}_1(\acute{s}_2)(\acute{s}_3)\dots(\acute{s}_n) \ / \left\{ \begin{array}{l} \acute{s} \\ s \end{array} \right\} - \quad \left. \begin{array}{l} \text{(in environ-} \\ \text{ments requir-} \\ \text{ing tone mu-} \\ \text{tation)} \end{array} \right\} \\ \grave{s}(\grave{s})(\grave{s})\dots(\grave{s}) \ / \left\{ \begin{array}{l} \acute{s} \\ s \end{array} \right\} - \quad \left. \begin{array}{l} \text{(same as} \\ \text{above)} \end{array} \right\} \end{array} \right\}$$

Figure 10 gives some illustrations of tone mutation in an adjective modifying construction, using the adjective /nìnǎ/ 'new' as the second element.

pélé	'house'	péléńínà	'new house'
ndòmǎ	'shirt'	ndòmǎńínà	'new shirt'
bèlè	'trousers'	bèlènìnà	'new trousers'
pùndí	'mosquito'	pùndínìnà	'new mosquito'

Figure 10: Illustration of tone mutation

2:46 A sequential analysis of tone

The rules given in 2:44 and 2:45 miss some important generalizations about the nature of Mende tone. The falling tone acts like a high tone when conditioning the realization of the polarized tone and when conditioned by a preceeding low or falling tone. On the other hand it behaves like a low tone when conditioning the downstep of a following high or falling and when conditioning tone mutation. Given that high and low are taken to be the features used to represent tone, both lexically and phonetically, then there are at least two objections to using a simultaneous clustering of plus

high (tone) and plus low (tone) to represent the falling tone. The first is that the theory does not permit both values of a feature to exist in the same segment. This is still true when a feature such as compact/ diffuse is subdivided into two features 1) plus compact/ minus compact and 2) plus diffuse/minus diffuse. In this situation, all combinations of compact and diffuse feature values are permitted in the same segment except plus compact and plus diffuse. This objection could be avoided by arbitrarily representing the falling tone as minus high and minus low, but this does not avoid the objection that it is impossible to both predict the realization of a preceeding polarized tone occurring before this segment and determine whether a following high tone should be stepped or not by simply examining the phonological features of the single segment used to represent the falling tone.

One promising alternative to a simultaneous representation of tone is a sequential representation of tone, that is, the falling tone for example can be taken as two tonal segments, a high followed by a low. This will explain why in some environments, a falling tone behaves like a high. It is now possible to make the generalization that polarized tones are low before an immediately following high and high elsewhere, which is a much broader generalization than that given in 2.44. The sequential representation also clarifies the similarity of the falling tones to low

tones. If the left hand segment of the falling tone is low, then high tones following low tones will predictably be downstepped. This again seems an improvement over the account in 2.44

If the Spears falling tone is analyzed sequentially as / $\acute{v}\grave{v}$ / and the polarized is analyzed as / $\acute{v}\acute{v}$ /, the generalizations concerning tone mutation can be made quite easily.

$$s_1(s_2)(s_3)...(s_n) \rightarrow \left\{ \begin{array}{l} \acute{s}_1(\acute{s}_2)(\acute{s}_3)...(\acute{s}_n) / \acute{s} \text{ — (in environments requiring tone mutation)} \\ \grave{s}_1(\grave{s}_2)(\grave{s}_3)...(\grave{s}_n) / \grave{s} \text{ — (same as above)} \end{array} \right\}$$

It should be pointed out that this system involves no greater number of specified features than a single segment system of representation. It also involves the specification of the same feature in two different segments, rather than the introduction of a new feature which does not have universal application.

As this tentative analysis now stands, it is unacceptable, for there already exist sequences of vowels, both / $\acute{v}\acute{v}$ / and / $\acute{v}\grave{v}$ / which contrast with / $\acute{v}$ / and / $\acute{v}$ /

kèlǔ 'faint from hunger'

kèlèé 'except, unless'

ngèwáà 'God'

ngóngô 'tooth'

These long vowels, as in /kèlèé/ and /ngèwáà/ are very much in the minority; it was difficult to find examples in the data. It is possible that these exceptions can

be predicted from some as yet undetected phonological clue, such as the second /v/ being some kind of suffixation which is no longer functional, but which provides the basis for positing a morpheme juncture between the two vowels. Given this juncture, it would be possible to maintain a contrast between / $\acute{v}\grave{v}$ / and / $\hat{v}$ / and between / $\acute{v}\acute{v}$ / and / $\check{v}$ /.

In view of the lack of supporting evidence, let us assume for the present that there are some exceptions to the rule that / $\acute{v}\acute{v}$ / is the lexical representation of the polarized tone and that / $\acute{v}\grave{v}$ / is the lexical representation of the falling tone. With this assumption, it is now possible to simplify the rules given in 2.44 as:

$$\text{rule a' } \quad \acute{v}\acute{v} \longrightarrow \left\{ \begin{array}{l} \acute{v} / _ + \acute{v} \\ \acute{v} \end{array} \right\} \quad (+ \text{ represents a morpheme boundary})$$

$$\text{rule b' } \quad \acute{v}\grave{v} \longrightarrow \acute{v} / _ \text{ S } \quad (\text{nonfinally})$$

$$\text{rule c' } \quad \acute{v} \longrightarrow \acute{v} / \grave{v} _$$

There remain a number of details to be worked out, such as the phonological treatment of nonfinal vowel clusters. One possible alternative is to represent the falling and polarized tones as a sequence of a tone marked vowel followed by an empty segment marked only for tone. Spears found this necessary anyway in order to account for otherwise unpredictable downsteps (cf. 3.25). This approach would avoid the need for marking exceptions

(/kèlèé/, /ŋgèwóò/ etc.) while maintaining the simplicity of the rules.

In any event, the sequential approach to tone transcription offers an alternative to the approach of establishing numerous clumsy and ad hoc tonal features. Here only one feature of tone is necessary: high and not high (or low and not low) to describe accurately and effectively the complex tonal behavior of Mende.

CHAPTER THREE

CONSONANT MUTATION PRELIMINARIES

3.1 Introduction

Consonant mutation involves a number of grammatical environments which will be enumerated below in 3.2. Many initial consonants have two forms, one which appears in mutating environments and the other one elsewhere.

Figure 11 is a list of the mutating consonants, showing both their mutated and nonmutated forms:

<u>nonmutated form</u>	<u>mutated form</u>
p	w
t	l
k	g
kp	gb
f	v
s	j
mb	b
nd	l
nj	y
ng	y (before front vowels)
ng	w (before back vowels)

Figure 11: Mende mutating consonants

Other Mende consonants have the same phonetic form in both environments.

Roughly speaking, it can be said that consonant mutation associates voiceless consonants with voiced consonants and prenasals with glides and liquids. The notable exceptions to this statement are /p/ which

mutates to /w/ and /mb/ which mutates to /b/.

3.2 Grammatical Environments for Consonant Mutation

All of the descriptions to date have either discussed the similarities of the Mande genitive (as it has become known) in the various Mande languages or have provided descriptively adequate accounts of this genitive for a particular language. Our own investigations indicate that both of these approaches as well as an adequate understanding of the phonological nature of consonant mutation will be necessary to produce a description which is explanatorily adequate for Mende. At this point, it is only possible to

give an idea of where consonant mutation is found, some of the surface structures where consonant mutation takes place.

3.21 Possessives

Consonant mutation always involves a noun or pronoun followed by a noun, verb, adjective or postposition whose initial consonant is mutated. The noun-noun constructions fall into two categories, compounds and possessives. There are three types of possessives, type one with both consonant mutation and tone mutation, type two with only consonant mutation, and type three with neither consonant mutation nor tone mutation. Type three is restricted to possessives of kinship names.

kekě	'father'	ńá kekě	'my father'
kêña	'uncle'	ńá kêña	'my uncle'
mamá	'grandmother'	ńá mamá	'my grandmother'

Figure 12: Type three possessives

Type two possession is restricted to body parts and is often called inalienable possession.

mbóla	'neck'	bí bóleí	'your own neck'
kówo	'foot'	bí gówéí	'your own foot'
nda	'name'	bí léí	'your own name'
ngâmâ	'eye'	bí yâmêí	'your own eye'

Figure 13: Type two possessives

Both type two and type one possession require the possessed noun to be definite.

Type one possession can be used with any noun. When used with a kinship name or a body part, it conveys the meaning that the present possessor is not the original possessor. Thus /ngĩ yámèí/ is an eye acquired from somebody else.

péle	'house'	ngĩ wélèí	'his house'
taã	'town'	ngĩ léèí	'his town'
tókpó	'palm tree'	mũ lókpòí	'our palm tree'
sani	'bottle'	wũ jánìí	'your(pl) bottle'
fula	'village'	tĩ vúlèí	'their village'
ngúlu	'tree'	ngĩ wúlìí	'his tree'

Figure 14: Type one possessives

3.22 Compounds

fefě	'wind'	kulă	'cloth'	fefě gúlà	'sail'
ńjaã	'water'	bôla	'cup'	ńjaã bólà	'water cup'

nikǎ	'cow'	fóma	'whip'	nikǎ vómà	'cow whip'
ñahǎ	'woman'	gbéhé	'stool'	ñahǎ gbéhè	'stool for a woman'
pù	'English'	ngúlu	'oil'	pù ngùlu	'imported oil'

Figure 15: Compounds

3.23 Adjectivals

ǰagba	'basin'	kútu	'short'	ǰagbà gùtù	'short basin'
bɛɛ	'trousers'	kolě	'white'	bèlè gólè	'white trousers'
ndáwa	'leaf'	mbé	'dry'	ndáwá bé	'dry leaf'

Figure 16: Adjectivals

3.24 Locatives

When a noun is followed by a postposition, consonant mutation takes place on the initial consonant of the postposition. Tone mutation takes place on some of the postpositions.

mbu	'under'	ǰagbà bù	'under a basin'
ma	'on, at'	ndáwá má	'on a leaf'
ngêya	'in possession of'	ñahǎ yêya	'in possession of a lady'

Figure 17: Locatives

3.25 Verb Phrases

When a sentence containing a transitive verb has an object, there is consonant mutation, but no tone mutation of the initial consonant of the verb which immediately follows the object. If the object is not present, there is no consonant mutation:

hiindòí ` à      ngí ñahéí ` voní `ló (foní 'pinch')
 the man will his wife pinch yes

kamóí `      à      búkuí ` gaâ `ló (kaâ 'read')
 the teacher will the book read yes

kamóí `      à      ` kaâ `ló
 the teacher will it read yes

A similar kind of mutation occurs between the subject
 and an intransitive verb:

mahéí `      à      lí `ló (ndí 'go')
 the chief will go yes

Figure 18: Verb phrases

When a low tone occurs without an accompanying vowel segment, it indicates that if the following tone is high, it will be downstepped.

3.3 Exceptions

3.3.1 Nonmutating Consonants

There are a small set of words in which the initial consonant ought to undergo consonant mutation, but for some reason does not. Innes (1963:19) gives the following examples:

teni	'train'
pani	'tin can'
sigeti	'cigarette'

All of these words are clear cut cases of borrowing, which helps to explain why these particular morphemes are outside the system. Any lexical item which does not undergo consonant mutation may be suspect of being a loan word and at any rate must be marked with a special

feature which will block consonant mutation,

3.32 The exception /d/

The special feature of 3.31 could also be used to explain other phonological phenomena in the language. For example, there is reason to believe that the systematic phoneme /d/ was established as part of the system as a result of borrowing. This borrowing occurred after an earlier */d/ merged with */l/ to produce the present /l/. There is strong evidence to support this:

1. In the present system, both /nd/ and /t/ mutate to /l/. This relationship can best be described by positing a more regular mutation such as

nd mutates to l

t mutates to d

followed by:

d merges with l

This makes it possible to strengthen the statement that voiceless consonants mutate to homorganic voiced consonants and that prenasalized consonants mutate to homorganic liquids or glides.

2. The conditioning environments for vowel mutation (cf 2.33) involves the following consonants:

/l, n, nd, t, y and w, but not d/

This set of consonants represents two natural phonological classes: alveolars and glides. It does not seem reasonable that the alveolar /d/ should be excluded, since this makes the description of vowel mutation much

ON APRIL 10, 1902, AT 10:51.

more complicated. Unless /d/ is considered to be outside the system, it is necessary to specify all of the alveolars with the exception of /d/. Matters could be simplified by postulating a special feature which blocks morphemes which contain this feature from undergoing the vowel mutation rule. This feature implies that all morphemes containing these /d/'s were not part of the original system of vowel mutation. This feature also marks the /d/'s of those morphemes that do not merge with /l/.

3. /d/ is relatively infrequent in present Mende, among one thousand of ~~the~~ syllables examined, there were only seven occurrences of /d/.

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CHAPTER FOUR

INTERNAL EVIDENCE

4.1 Preliminaries

The phonetic processes of Mende consonant mutation suggest that the underlying system is regular. While it is generally true that prenasalized consonants mutate to glides and voiceless obstruents mutate to voiced obstruents, there are some notable exceptions:

mb	mutates to	b
p	"	w
t	"	l

The simplest and most reasonable approach to the understanding of the above facts is to assume the existence of a more regular lexical representation of all mutating consonants which have been modified slightly by subsequent phonological rules to produce the observable phonetic system.

4.2 Clear Cases

The simplest approach at this point is to identify the clear cut cases of consonant mutation which appear to be consequences of a regular set of rules of consonant mutation, and from this information, generalize about the less clear cases.

The general rules of consonant mutation are as follows:

prenasals $\longrightarrow$ homorganic liquids and glides / $\uparrow$ CM —
 voiceless obstruents $\longrightarrow$ voiced obstruents / $\uparrow$ CM —

($\uparrow$ CM is an abbreviation for environments requiring consonant mutation)

Given the above generalizations, the clear cut cases of a regular system of consonant mutation in Mende are as follows:

		labial	alveolar	palatal	velar	lab-velar
prenasals	nonmutated		nd	ñj		
	mutated		l	y		
stops	nonmutated				k	kp
	mutated				g	gb
fricatives	nonmutated	f				
	mutated	v				

Figure 19: Clear cases of consonant mutation

4.3 /t/, /s/ and /ŋg/

Given the above generalizations, the following mutations are anticipated, but do not occur:

1. */t/ mutates to */d/. Actually, /t/ mutates to /l/.

This discrepancy can be explained by a rule:

$d \longrightarrow l$

Section 3.32 presents further arguments which support the correctness of this rule.

2. */s/ mutates to /z/ or */č/ mutates to /j/. Actually, /s/ mutates to /j/. Here there is some comparative evidence to clarify matters. Welmers (1958:23) gives the

following data for Kpele, Loma and Mende:

English	Kpele	Loma	Mende
medicine	sálé	sálé	hálé
elephant	sélé	sée	hélé
animal	sūā	sūō	huá
arrive	sērĩ	sítí	hítí

Figure 20: */s/ in Kpele, Loma and Mende

The above data suggest that in Mende, /s/ shifted to /h/ and that /č/ shifted to /s/ to fill a hole in the pattern. It is therefore reasonable and natural to represent /s/ lexically as /č/ followed by a rule:

$$\check{c} \longrightarrow s$$

Another possibility is to consider the entire palatal series to be a sequence of two segments, a dental followed by the glide /y/. In all cases but /ty/ the result is a palatal consonant. In the case of /ty/ the /t/ softens to /s/ and the /y/ disappears. Chomsky and Halle (1968:231) propose a /y/ deleting rule in order to account for a similar phonological shift in English.

Keeping the second possibility in mind as a more realistic explanation of the facts, but as yet undocumented for Mende, we will continue to use the present system of palatal transcription.

3. */ŋg/ mutates to /ɣ/ a velar glide. Actually, /ŋg/ mutates to /y/ before front vowels and to /w/ before back vowels. This apparently is the consequence of the split of /ɣ/ followed by a two fold merger:

$$\gamma \longrightarrow \left\{ \begin{array}{l} y / - v^{\text{non}} \\ w \quad \text{back} \end{array} \right\}$$

This will allow the mutation of /ŋg/ to /y/ or /w/ to be represented lexically as /ŋg/ to /γ/ which conforms to the generalization that prenasalized stops mutate to homorganic glides and liquids.

With these adjustments of the above mutations, the clear and natural cases of consonant mutation are as follows:

		labial	alveolar	palatal	velar	lab-vel
prenasals	nonmutated		nd	ñj	ng	
	mutated		l	y	γ (→y,w)	
stops	nonmutated		t	č (→s)	k	kp
	mutated		d (→l)	ǰ	g	gb
fricatives	nonmutated	f				
	mutated	v				

Figure 21: Expanded list of clear cases

4.4 Remaining unclear cases

Given the same above generalizations, the following mutations are anticipated, but do not occur:

1. */mb/ mutates to /w/
2. */p/ mutates to /b/

Actually, /mb/ mutates to /b/ and /p/ mutates to /w/. It is possible to propose any number of lexical representations for the above mutations, but due to the lack of supporting evidence in Mende, it is impossible to determine which one

is more correct. For example, it is possible to represent:

1. /mb/ to /b/ lexically as /mb/ to /w/ and
2. /p/ to /w/ lexically as /p/ to /b/

followed by a polarization rule:

$$\begin{bmatrix} b \\ w \end{bmatrix} \rightarrow \begin{bmatrix} w \\ b \end{bmatrix}$$

Even if it were clear that this rule applied only to a /w/ which was the result of a mutation from /mb/, the rule is still suspicious. It is difficult to conceive of two consonants reversing themselves like this.

Another possibility is to represent:

1. /mb/ to /b/ lexically as /ngb/ to /ɣ^w/
(/ngb/ does not occur morpheme initially)
2. /p/ to /w/ lexically as /p/ to /b/

followed by the rules

$$\begin{aligned} b &\rightarrow w \\ \gamma^w &\rightarrow b \\ ngb &\rightarrow mb \end{aligned}$$

But this is no more satisfying than the polarization proposal, and, in addition, there is no Mende evidence which makes it possible to choose between the two.

Finally it is possible to represent:

1. /p/ to /w/ lexically as /mb/ to /w/

followed by a rule:

$$mb \rightarrow p$$

2. /mb/ to /b/ lexically as /ngb/ to /ɣ^w/

followed by the rules:

$$\eta gb \longrightarrow mb$$

$$\gamma w \longrightarrow w$$

3. /f/ to /v/ lexically as /p/ to /b/

followed by the rule which adds [+continuant] to /p/ and /b/:

$$\begin{bmatrix} p \\ b \end{bmatrix} \longrightarrow \begin{bmatrix} f \\ v \end{bmatrix}$$

If the /p/ to /w/ mutation is represented lexically as /mb/ to /w/, the feature of [+continuant] could be added here in a redundancy rule. This representation results in the disappearance of fricatives in the lexical representation.

4.5 Inadequacies of the proposed description.

4.51 Lack of uniqueness

The fact that it has been impossible to provide a unique description of this phenomena with no means of deciding which one is more correct, suggests that our account, so far, is inadequate. This is an extremely important criticism. Although this might be a consequence of an inadequate theory, it is much more likely that it is a consequence of a lack of the right kind of evidence which could lead to a unique description. It is clear that this kind of evidence is not available in Mende and that if we are to find it at all, we will have to turn our investigation to other languages in which similar phenoment occur. In other words, if we are to advance our understanding of consonant mutation in Mende, we must see it as a special case of a process occurring in many languages.

4.52 Lack of generality

A second inadequacy is found in the rules describing

consonant mutation. Although the rules presented were general and considered the individual mutations to be consequences of these rules, it was still necessary to postulate two different rules, one for the prenasal series and one for the voiceless obstruent series, implying that these two processes are completely unrelated.

Two phonological phenomena conditioned by the same grammatical environments and operating on different sets of phonological segments seem unnecessary. It is much more reasonable to assume that all the phonological segments are subject to a single rule conditioned by the grammatical environments and that the individual variations are consequences of subsequent phonological changes. As yet, it is impossible to provide a unique rule which will do this. It is possible to provide many rules, but impossible to decide between them. Again it is clear that Mende alone cannot provide the answer.

4.6 Other sources of data

The next questions to be asked are where to look and what to look for? The most immediate relatives of Mende are the other Southwestern Mande languages: Loko, Bandi, Loma and Kpele (also spelled Kpelle). These languages have similar systems of consonant mutation which are conditioned by similar grammatical environments. A similar type of consonant mutation also occurs in some of the West Atlantic languages: Tanda, Konyagi, Fula, Bifada and Pajade. Both of these sets of languages contain

information which will lead to a better understanding of consonant mutation in Mende and will be investigated in the following chapter. Other languages could also have been examined, but were not because they were either irrelevant or undocumented.

CHAPTER FIVE

COMPARATIVE EVIDENCE

5.1 Consonant mutation in West Atlantic

Consonant mutation in these languages involves three levels or grades of alternation, each one associated with a particular set of grammatical classes and affixes. In Fulani for example, the mutation grades for /ŋg/ are as follows:

Grade I	ŋg
Grade II	g
Grade III	w

The following data are from Stennes (1967:65)

ngílinga worm	ngóota one	'one worm'	Grade I
gúdel sarong	góotel one	'one sarong'	Grade II
wúro town	wóoto one	'one town'	Grade III

In Biafada, there are twenty-one noun classes. Associated with each noun class is a concord prefix, each of which requires one of the three mutation grades given above.

Prefixes requiring grade I : ga-, gu-, ma₁-, nu-

Prefixes requiring grade II : (wa-), fu-, ma₂-, sa-

Prefixes requiring grade III: u-, bə-, (gaa-), bee-
bu-, bwa-, fa-, ge-, lu-, ju-, maa-, nya-, saa-

(classes indicated in brackets have zero prefixes in nouns and certain dependent classes)

Examples:

nə-nda nə-mbe u diigal	'the stranger's child'
child stranger	
ma-dda ma-bbe u diigal	'the stranger's children'
child stranger	
ø-kada ø-bbe u diigal	'the stranger's area of bush'
bush stranger	
maa-həda maa-be u diigal	'the stranger's areas of bush'

Figure 22: Consonant Mutation in Biafada (Wilson 1965:16)

5.2 Mutation Grades in West Atlantic

In figure 23, we have attempted to group phonetically similar mutation grades of the following West Atlantic languages: Tanda, Konyagi, Fula, Bifada and Pajade. The data upon which this table is based are from Wilson(1965).

Tanda			Konyagi			Fula			Pajade			Biafada		
I	II	III	I	II	III	I	II	III	I	II	III	I	II	III
p	p	f	p	p	ø	p	p	f	pp	pp	f	mp	p	f
t	t	z	t	t	r	t	t	t	tt	tt	s	nt	t	r
c	c	z	c	c	s	c	c	s	cc	cc	s	nc	c	s
k	k		k	k	h	k	k	h	kk	kk	ø	ηk	k	h
kw	kw	w												
	b	b	mb	b		b			mb	bb	b	mbw	bbw	bw
	d	r	nd	d	ry	d			nd	dd	d	nd	dd	d
	'y	'y	ñj	'y	y	'y			ñj	'y	j	ñj	j	j
												ηg	gg	g
m	m	w	m	m	w	m			mm	mm	m		mm	m
n	n	l	n	n	ñ	n			nn	nn	n		nn	n
ñ	ñ	y	ñ	ñ	y	ñ			ññ	ññ	ñ		ññ	ñ
η		ø	η	η	y	η			ηη	ηη	η		ηη	η
	b	w				mb	b	w	mp	p			ww	w
n	d	l	nt	d	l	ñj	j	y	ñc	c			yy	y
ñj	j	y	ñc	j	y	ñj	j	y	ñk	k	4			
ng	g	ø	ηk	g	2	ng	g	3	ηk	k	4			
nd	d	r				nd	d	r	nt	t	r	nr	r	l
ngw	gw											ngb	ggb	bw

2: ø, y, w 3: y, w 4: w, ø

Figure 23: Mutation Grades in West Atlantic

5.3 The original system

The preliminary investigation of these West Atlantic languages indicates the possibility of a common system of mutation. This system consists of three grades of consonants. The first grade of any consonant is the prenasal NC, the second grade is a doubled consonant CC and the third grade of that consonant is the consonant alone C. Thus the underlying mutation system of these West Atlantic languages under investigation is tentatively proposed as follows:

vls stops	NC	mp	nt	ñč	ŋk	ŋkp
	CC	pp	tt	čč	kk	kkp
	C	p	t	č	k	kp
vd stops	NC	mb	nd	ñǰ	ŋg	ŋgb
	CC	bb	dd	ǰǰ	gg	ggb
	C	b	d	ǰ	g	gb
nasals	NC	mm	nn	ññ	ŋŋ	
	CC	mm	nn	ññ	ŋŋ	
	C	m	n	ñ	ŋ	
liquids &	NC	mw	nl	ñy	nr	(nɣ)?
glides	CC	ww	ll	yy	rr	(ɣɣ)?
	C	w	l	y	r	(ɣ)?

Figure 24: Regularized Mutation Grades in West Atlantic

5.4 Subsequent Changes

5.4.1 Denasalization

Subsequently, this system underwent a number of modifications. One of these important modifications of

the system occurred in all of these languages except Biafada:

+nasal $\longrightarrow$ -nasal / -voice

which resulted in the following modification of the voiceless stop series:

NC	CC	C	$\longrightarrow$	NC	CC	C
mp	pp	p		pp	pp	p
nt	tt	t		tt	tt	t
ñč	čč	č		čč	čč	č
ŋk	kk	k		kk	kk	k
ŋkp	kkp	kp		kkp	kkp	kp

Figure 25a: Modification of the voiceless stop series

5.42 Softening and voicing

Following this, either or both of the following rules occurred:

softening Stops $\longrightarrow$ Fricatives / intervocalically

voicing C_{vl} $\longrightarrow$ C_{vd} / intervocalically

5.43 Reduction

This was followed by consonant reduction:

reduction CC $\longrightarrow$ C if both C's are identical

This produced the following systems:

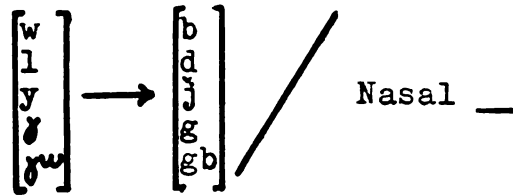
original system			1.voicing 2. reduction			1. softening 2. reduction			1. softening 2. voicing 3. reduction		
NC	CC	C	NC	CC	C	NC	CC	C	NC	CC	C
pp	pp	p	p	p	b	p	p	f	p	p	v
tt	tt	t	t	t	d	t	t	s	t	t	z
čč	čč	č	č	č	č	č	č	s	č	č	z
kk	kk	k	k	k	g	k	k	x	k	k	ɣ
kkp	kkp	kp	kp	kp	gb	kp	kp	xw	kp	kp	xw
			(Mende like)			(Fula like)			(Tanda like)		

Figure 25b Softening, voicing and reduction

Compare the above systems with those given in Figure 23.

5.44 Liquids and Glides

In most of the languages, prenasalized liquids and glides become homorganic prenasalized stops.



Which produces the following system:

NC	CC	C	→	NC	CC	C
mw	ww	w		mb	ww	w
nl	ll	l		nd	ll	l
ñy	yy	y		ñʒ	yy	y
ŋʃ	ʃʃ	ʃ		ŋg	ʃʃ	ʃ
ŋɹw	ʃɹw	ɹw		ŋgb	ʃɹw	ɹw

Figure 26: Liquids and glides

5.45 Voiced stops and nasals

The voiced stop series and the nasal series have not undergone any extensive modification and remain more or less as they do in their underlying representation:

Voiced Stops			Nasals		
NC	CC	C	NC	CC	C
mb	bb	b	mm	mm	m
nd	dd	d	nn	nn	n
ñʒ	ʒʒ	ʒ	ññ	ññ	ñ
ŋg	gg	g	ŋŋ	ŋŋ	ŋ

Figure 27: Voiced stops and nasals

5.46 Summary of the West Atlantic data

This completes a tentative analysis of the underlying system of consonant mutation of Tanda, Konyagi, Fula, Pajade and Biafada. On the basis of the meager data involved, one cannot be very certain that the suggested underlying system is the correct one. For example, it is theoretically possible to represent the underlying consonants of the liquid series as either voiced stops or fricatives. We have not chosen to do so, since this would produce a language with no underlying liquids or glides, something which appears highly unlikely. If the underlying consonants were voiced stops, there would be two series of voiced stops in the language, presumably one of them glottalized. It is equally possible that the underlying consonants in the voiceless stop series are voiceless fricatives, but this is considered unlikely because it would necessitate a rule stating that certain voiceless fricatives become stops in situations where one would not expect them to. Furthermore, the Mende data favors the voiceless stop representation.

5.5 Similarities between West Atlantic mutation and Southwestern Mande mutation

Like Mende, all Southwestern Mande languages have two degrees of mutation as opposed to three degrees for the West Atlantic languages. This is the most important difference between them. The mutations are completely understandable, and almost every mutation in Southwestern Mande has a corresponding mutation in one of the above West

Atlantic languages.

Figure 28 is based on the data collected by Meeussen (1965), comparing consonant mutation in the various South-western Mande languages. For each language, there are two columns: column A represents the form of the consonants in nonmutating environments and column B represents the form of the consonants in mutating environments. Each row, as far as Meeussen can determine, represents the various reflexes of a proto-phoneme. He appears to be at least partly in error in considering Mende /s/ to /ʃ/ to be related to Loma /s/ to /z/. It was well established in section 4.3, that at least some of Loma's /s/'s are related to Mende's /h/'s.

In column B of Figure 28, when two consonants are separated by a colon, the first consonant is found before front vowels and the second before back vowels. The phonetic interpretation of the Kpele transcription is given in section 7.2

Mende		Bande		Loma		Loko		Kpele	
A	B	A	B	A	B	A	B	A	B
m	m	n	ỹ: Ẃ	m	m	m	Ẃ	`m~	m~
n	n	n	n	n	n	n	n	`n~	n~
ñ	ñ	ñ	ỹ	ñ	ñ	ñ	ñ	`ñ~	ñ~
ŋ	ŋ	ŋ	y:w	ŋ	ŋ	ŋ	ŋ	`ŋ~	ŋ~
mb	b	mb	y:w	b	β:w	mb	b(β?)	`m	Ḅ
nd	l	nd	l	d	l	nd	l	`n	l
ñj	y	ñj	y	z	y	ñj	y	`ñ	y
ŋg	y:w	ŋg	y:w	g	ɣ:w	ŋg	?:w	`ŋ	ɣ
p	w	p	v	p	β:w	p	b(β?)	`p	p
t	l	t	l	t	l	t	r	`t	t
k	g	k	:w	k	:w	k	g(ɣ)	`k	k
kp	gb	kp	gb	kp	Ḅ	kp	Ḅ	`kp	kp
f	v	f	h	f	v	f	h	`f	f
s	j	s	h	s	z			`s	s

Figure 28: Mutation in Southwestern Mande

CHAPTER SIX

CONSONANT MUTATION AND MENDE

6.1 Introduction

In view of the fact that West Atlantic consonant mutation and Southwestern Mande consonant mutation are so similar, it is difficult to believe that they are not related in some way. While both Mande and West Atlantic are subgroups of the Niger-Congo language family and ultimately related, the degree of similarity in the mutational systems is much greater than other aspects of the language (lexicon, grammar and phonology) would indicate. This suggests the possibility that these languages may have acquired a similarity in mutational systems through recent contact rather than "genetic inheritance". More specifically, they may have acquired the prefix system and the phonological rules which operate on them from the West Atlantic languages. It does not appear likely that the West Atlantic languages acquired their mutational systems from Southwestern Mande, primarily because of the fact that West Atlantic has three grades of mutation, and it is easier to conceive of the disappearance of one grade or the merger of two grades than the subdivision of one grade into two. There is also another

slight possibility that both systems developed independently and that the similarity of patterning is a consequence of the natural phonological rules which operate on them.

6.2 The prefix system

It was mentioned that the mutation grades of the West Atlantic languages were related to the various class prefixes. Thus, any noun requiring a prefix of a certain class would undergo consonant mutation at the grade associated with the prefix. Consonant mutation may very well have been the consequence of the phonological nature of the various types of prefixes. Those prefixes ending in nasals may have established the NC grade.

prefix noun

cvn- cvcv

followed by a loss of the cv in the prefix:

n- cvcv

followed by a functional loss of the prefix:

ncvcv

Those prefixes ending in consonants may have established the CC grade:

prefix noun

cvc- cvcv

followed by a loss of the cv in the prefix:

c- cvcv

followed by a functional loss of the prefix:

ccvcv

Those prefixes ending in vowels may have established the

C grade.

6.3 The Mende prefix

The prefix system of Mende is a two class rather than a three class system. That is, either the NC and the CC classes merge or the CC class disappears. The denasalization rule (cf 5.41) and the reduction rule (cf 5.43) indicate that this must also be true for some of the West Atlantic languages as well. In addition, the prefixes in Mende have disappeared, leaving only the NC and C mutation grades as evidence that they once existed. In Fula, for example, these prefixes have been superceded by suffixes, although mutation still takes place on the initial consonant. The data present in section 5.1 illustrate the occurrence of these concord suffixes.

6.4 The prefix /N-/

Like the West Atlantic languages, consonant mutation in Mende is the result of the presence or absence of prefixes. In Mende, consonant mutation involves only the NC grade of prefixes. Because the final consonant is all that remains of these prefixes, it is possible to represent them in the lexicon as simply /N-/. Those nouns which do not undergo consonant mutation (cf 3.21) do not have this prefix.

6.5 The explanation for consonant mutation in Mende

The rule for consonant mutation in Mende is really a very simple statement: the deletion of the prefix /N-/ in certain grammatical environments, identified for the

present as +CM.

consonant mutation $N- \longrightarrow \emptyset / +CM \text{ ___}$

6.6 The lexical representation of Mende consonants

The lexical representations of the Mende mutating consonants are as follows. The symbols enclosed in parentheses are the final phonetic realizations, and indicate phonological changes that take place after the general rule for consonant mutation.

<u>Lexical</u>	<u>Unmutated</u>	<u>Mutated</u>
Np	p	b (w)
Nt	t	d (l)
Nč	č (s)	ʃ
Nk	k	g
Nkp	kp	gb
Nf	f	v
Nb	mb	b
Nl	nd	l
Ny	ñj	y
Nɣ	ng	ɣ (y,w)

Figure 29: The lexical representation of Mende consonants

6.7 The rules for consonant mutation in Mende

The rules for consonant mutation in Mende are as follows:

1. $N- \longrightarrow \emptyset / CM \text{ ___}$
2. $\begin{smallmatrix} p \\ t \end{smallmatrix} \longrightarrow \begin{bmatrix} w \\ l \end{bmatrix} / V \text{ ___ } V$
3. $C_{vls} \longrightarrow C_{vd} / V \text{ ___ } V$

4. $N- \longrightarrow \emptyset / _ C_{vls}$
5. $\begin{bmatrix} l \\ y \\ r \end{bmatrix} \longrightarrow \begin{bmatrix} d \\ g \\ \end{bmatrix} / N _$
6. $\check{c} \longrightarrow s \quad (\text{cf } 3.32)$
7. $\gamma \longrightarrow \left\{ \begin{array}{l} \gamma \\ \gamma \end{array} \right\} / _ v^{\text{non back}}$

6.8 Application of the rules.

Figures 30 and 31 illustrate the operation of the above rules. Figure 30 represents the nonmutating environments and Figure 31 represents the mutating environments.

Lexical Representation	1	2	3	4	5	6	7	F
Np				p				p
Nt				t				t
N $\check{c}$				$\check{c}$		s		s
Nk				k				k
Nkp				kp				kp
Nf				f				f
Nb								mb
Nl					nd			nd
Ny					$\check{n}\check{j}$			$\check{n}\check{j}$
N γ					ηg			ηg

Figure 30: Application of the rules in nonmutating environments

Lexical Representation	1	2	3	4	5	6	7	F
Np	p	w						w
Nt	t	l						l
Nč	č		ǰ					ǰ
Nk	k		g					g
Nkp	kp		gb					gb
Nf	f		v					v
Nb	b							b
Nl	l							l
Ny	y							y
Nɣ	ɣ						y w	y w

Figure 31: Application of the rules in mutating environments

6.9 Summary

The most important advantage that the description in 6.6 and 6.7 has over the one attempted in Chapter four is that it offers an explanation of why there should be consonant mutation in the first place by positing the existence of a vestigial prefix system. Once the nature of consonant mutation is understood, it is possible to offer a description in which one general and simple rule describes the mutation of all consonants. Subsequent rules are necessary to describe subsequent phonological changes, but it is important to point out that all of these rules are "natural" in generative phonological terminology with a few exceptions which will be discussed in Chapter six.

The next chapter lends support to the present

description based on the prefix hypothesis and clarifies some of the lexical representations where the evidence so far has been scant.

CHAPTER SEVEN

REINFORCEMENT OF THE PREFIX HYPOTHESIS

7.1 The problem

Kpele mutation has for some time puzzled linguists. The problem is that some of the consonants seem to mutate the "wrong way" when compared to the other Southwestern Mande languages. In Mende for example, one finds /k/ to /g/ while in Kpele one finds /g/ to /k/.

7.2 Kpele mutation

Figure 32 gives some examples of Kpele words in both the definite and indefinite. Mende cognates are also given where possible. The data is from Welmers(1962). A subscript comma has been used here to represent nasalization to avoid confusion with the tone markings. Those nasals marked with a low tone have been so marked because they cause a following high to be downstepped. In order to idealize the system, Welmers posited an element of prevoicing of low tone / ` / which precedes all initial consonants of nouns beginning in the definite. When the noun is in the indefinite, this particle is deleted.

116.

Gloss	Kpele		Mende	
	Definite	Indefinite	Unmutated	Mutated
wax	ṁóoi	ḅóo		
fog	ṇúui	lúu	ndùlû	lùlû
dog	ṇílai	yíla	ṇgíla	yíla
white clay	ṇwéei	wée		
water	ṇyái	yá	ñǰàǎ	yǎǎ
horn	ṁélai	méla		
person	ṇúui	núu	númu	númu
rat	ṇwánâi	ṇwána		
fish	ṇyéei	nyée	ñé	ñé
house	ḅérei	pére	péle	wéle
town	ḁaai	taa	taǎ	laǎ
log	ḡooi	koo	kòwũ	gòwu
wind	ṽaai	faa	fɛfě	vɛvě
thing	ẓeŋ	seŋ	hanĩ	hàni

Figure 32: Kpele mutation

7.3 Kpele mutation and Mende lexical representation

Meeussen(1965) then took this transcription and demonstrated that the Kpele system was consistent with the other Southwestern Mande languages (cf 5.5).

Figure 33 contains Welmers' transcription of Kpele, a phonetic transcription of Kpele, as closely as I can determine it from the literature, and the equillivant Mende lexical representation. A nasal followed by /~/ indicates that the following vowel is nasalized.

Kpele Welmers'		Kpele Phonetic		Mende Lexical	
UM	M	UM	M	UM	M
`m~	m~	`m~	m~	Nm	m
`n~	n~	`n~	n~	Nn	n
`ny~	ny~	`ny~	ny~	Nñ	ñ
`ŋ~	ŋ~	`ŋ~	ŋ~	Nŋ	ŋ
`m	ɓ	`m	ɓ	Nb	b
`ny	y	`ny	y	Ny	y
`ŋ	ɣ	`ŋ	ɣ	Nɣ	ɣ
`f	f	`v	f	Nf	f
`s	s	`z	s	h	
`p	p	`b	p	Np	p
`t	t	`d	t	Nt	t
				Nč	č
`k	k	`g	k	Nk	k
`kp	kp	`gb	kp	Nkp	kp
`ŋw	w	`ŋw	w	(Nw	w)

Figure 33: Kpele mutation and Mende lexical representation

7.4 Phonological differences

7.41 /s/ and /ʃ/

In section 4.3, it was clearly demonstrated that Mende /h/ in some environments at least is cognate with Kpele /s/, and that Mende /s/ has the lexical representation /č/.

Kpele does not have a consonant which could be represented lexically as /č/. Either the protoconsonants */č/ and */ʃ/ merged with */s/ and */z/ in Kpele or the Mende /s/ and /ʃ/

were derived from palatalized /t/'s and /d/'s as was suggested in section 3.32. However at this point, there is no further evidence to either prove or disprove either hypothesis.

7.42 Mende /mb/ to /b/

Mende /mb/ to /b/ is cognate with Kpele /ṁ / to /ḃ/ as the following figure indicates:

Gloss	Kpele	Loma	Mende
knife	ḃáa	bóá	mbówa
sheep	ḃála	báálà	mbála
spirit	ḃélá	?	mbéla

Figure 34: Comparative data for /mb/

It seems much more likely that the protoconsonant is /ḃ/ rather than /b/, that is it is easier to account for the loss of glottalization in all /ḃ/'s or in certain environments of /ḃ/ than for certain /b/'s in Kpele to arbitrarily acquire this feature. Note that there also exist in Kpele nonglottalized /ḃ/'s as well.

It is possible to speculate further concerning the earlier forms of /ḃ/, but it is not relevant to the immediate problem of comparing Kpele and Mende, It would be of value to know why there is only one voiced stop in the above lexical representation of these languages.

7.43 The status of Mende /p/ to /w/

The comparative Kpele data now makes the lexical status of the Mende /p/ to /w/ clear as well. This mutation corresponds to the Kpele /ṽp/ to /p/ mutation.

Mende	péle	to	wéle	'house'
Kpele	`pélé	to	pélé	'house'

The above data support the Mende lexical representation given in 6.6. That is, the lexical representation of Mende /p/ to /w/ is /Np/ to /p/ followed by the general rule:

$$C_{vls} \longrightarrow C_{vd} / \quad V \quad _ \quad V$$

followed by :

$$b \longrightarrow w$$

This final rule does not occur in Kpele.

7.44 /f/ and /v/

Given that a lexical /p/ already exists, the status of the /f/ to /v/ mutation is no longer in doubt, it must remain a fricative. Note that the status of the consonants clarified in section 7.4 was in doubt in section 4.4.

7.5 Equivalence of transcription

It is also clear that the Kpele element of low tone prevoicing posited by Welmers and the Mende nasal prefix of our own system are equivalent. In order to account for the downstep of following high tones, it is necessary to retain the feature of low tone in the prefix. It is also clear that the feature of nasality must be retained in order to account for the nasal to liquid mutations in both Kpele and Mende.

It is quite possible that the low tone necessary for Kpele may also be very useful in Mende. There are a number of grammatical environments where downsteps occur, which cannot be predicted from the lexical items themselves, (cf. 3.25);

perhaps some of these can be accounted for by adding a low tone to the prefix.

7.6 Rules for Kpele mutation

The rules for Kpele mutation are as follows:

1. mutation $\overset{\cdot}{N} \longrightarrow \emptyset / CM _$
2. hardening $\begin{bmatrix} l \\ y \\ \gamma \\ w \end{bmatrix} \longrightarrow \begin{bmatrix} d \\ j \\ g \\ gb \end{bmatrix} / \overset{\cdot}{N} _$
3. assimilation of $\overset{\cdot}{N}$
4. $\check{c} \longrightarrow s$
5. $N \longrightarrow \overset{\cdot}{N} \sim$ (nasalizes the following vowel)
6. $C_{vd} \longrightarrow \emptyset / \overset{\cdot}{N} _$
7. $\overset{\cdot}{N} C_{vls} \longrightarrow C_{vd}$

7.7 Application of the rules

Figure 35 illustrates the operation of these rules in nonmutating environments and Figure 36 illustrates the operation of these rules in mutating environments:

Lexical Representation	1	2	3	4	5	6	7	F
$\overset{\cdot}{N}m$			$\overset{\cdot}{m}m$		$\overset{\cdot}{m}m \sim$	$\overset{\cdot}{m} \sim$		$\overset{\cdot}{m} \sim$
$\overset{\cdot}{N}n$			$\overset{\cdot}{n}n$		$\overset{\cdot}{n}n \sim$	$\overset{\cdot}{n} \sim$		$\overset{\cdot}{n} \sim$
$\overset{\cdot}{N}\check{n}$			$\overset{\cdot}{n}\check{n}$		$\overset{\cdot}{n}\check{n} \sim$	$\overset{\cdot}{n} \sim$		$\overset{\cdot}{n} \sim$
$\overset{\cdot}{N}\eta$			$\overset{\cdot}{\eta}\eta$		$\overset{\cdot}{\eta}\eta \sim$	$\overset{\cdot}{\eta} \sim$		$\overset{\cdot}{\eta} \sim$
$\overset{\cdot}{N}b$			$\overset{\cdot}{m}b$			$\overset{\cdot}{m}$		$\overset{\cdot}{m}$
$\overset{\cdot}{N}l$		$\overset{\cdot}{N}d$	$\overset{\cdot}{n}d$			$\overset{\cdot}{n}$		$\overset{\cdot}{n}$
$\overset{\cdot}{N}y$		$\overset{\cdot}{N}j$	$\overset{\cdot}{n}j$			$\overset{\cdot}{n}$		$\overset{\cdot}{n}$
$\overset{\cdot}{N}\gamma$		$\overset{\cdot}{N}g$	$\overset{\cdot}{\eta}g$			$\overset{\cdot}{\eta}$		$\overset{\cdot}{\eta}$

Figure 35 continued

Lexical Representation	1	2	3	4	5	6	7	F
Nw		Ṡgb	Ṡwgb			Ṡw		Ṡw
Np			Ṡp				b	b
Nt			Ṡt				d	d
Nč			Ṡč	Ṡs			z	z
Nk			Ṡk				g	g
Nkp			Ṡgb				gb	gb
Nf			Ṡf				v	v
Ns			Ṡs				z	z

Figure 35: Kpele consonant mutation in nonmutating environments

Lexical Representation	1	2	3	4	5	6	7	F
Nm	m				m~			m~
Nn	n				n~			n~
Nñ	ñ				ñ~			ñ~
Nŋ	ŋ				ŋ~			ŋ~
Nb	b							b
Nl	l							l
Ny	y							y
Nɣ	ɣ							ɣ
Nw	w							w
Np	p							p
Nt	t							t
Nč	č		s					s
Nk	k							k

Figure 36 continued

Lexical Representation	1	2	3	4	5	6	7	F
Nkp	kp							kp
Nf	f							f
Ns	s							s

Figure 36: Kpele consonant mutation in mutating environments

7.8 Summary

The above rules are not intended as a final description of Kpele mutation. Much more investigation would be necessary before such an undertaking could even be considered. What is intended is a rough approximation of the system as further support for the prefix system and lexical representations of Mende.

In this chapter, it was demonstrated that Kpele consonant mutation, which in phonetic appearance is vastly different from Mende consonant mutation, can be described by the postulation of the same prefix system in the lexical representation followed by many of the same rules used in Mende. In Kpele, it was necessary to postulate a feature of low tone in this prefix in order to predict the downstepping of a following high tone, and it was speculated that this feature of low tone may also be useful in Mende for predicting similar types of phonetic behavior. Other comparative data from Kpele gave further support for the lexical representation of Mende consonants, namely /Nč/, /Nb/, /Np/, and /Nf/.

CHAPTER EIGHT

CONCLUSIONS

8.1 Introduction

In this chapter, we would like to discuss a number of different points which have come to light as a result of our investigations.

8.2 The regularity of the Mende mutational system

At first glance, the phonetic data of Mende consonant mutation appear to be haphazard and unsystematic, something which could be contrary to the assumptions of the current theory of generative phonology which assumes that phonological systems are largely regular and systematic. Consonant mutation was investigated to see if it were possible to treat it in a generative phonological framework, assuming each mutation to have a natural underlying or lexical representation which is processed by the same set of general phonological rules. Once sufficient evidence became available, it was found that consonant mutation in Mende indeed conforms to the assumptions of this theory.

8.3 Summary of consonant mutation

Although our present description of consonant mutation is tentative, it does begin to achieve explanatory adequacy. While it does

not explain why there should be a prefix system of this sort in Southwestern Mande in the first place or why the conditioning environments should be as they are, it has proposed that consonant mutation is the phonological consequence of the existence of the prefix /N-/. The existence of a low tone on the prefix, which was necessary to account for otherwise unpredictable downsteps in Kpele may also account for some of the numerous downsteps which Spears found necessary to insert in his transcription in order to make it descriptively adequate. Further study is required to support this claim, but once the prefix and its deletion are assumed, it is possible to explain in a simple way, why the /nd/ to /l/ and the /k/ to /g/ mutations are consequences of the same phonological phenomenon.

8.4 The use of comparative data

In many cases it was found that Mende alone would not provide the data necessary to provide us with a unique and explanatorily adequate description of consonant mutation. In these cases, it was often found that similar data from other related languages could provide the necessary data by considering consonant mutation in Mende to be a special case of a more widely spread phenomenon. It is also felt that further comparative study of other Mande and West Atlantic languages may provide the necessary evidence to either confirm or modify our tentative phonological analysis of consonant mutation in Mende and perhaps lead

to a better understanding of the grammatical aspects of the problem.

8.5 Further areas of investigation

There are many areas which ought now to be investigated. Among the most important is the grammatical aspect of this problem. What was the origin of the prefix /N-/ and how was it originally used? Can it be traced back to something common to both West Atlantic and Mande or even Niger-Congo, or was it something which was borrowed into South-western Mande from West Atlantic? Why are the grammatical environments which condition the deletion of this prefix so similar from language to language, and what is it that grammatical environments have in common which causes the deletion of this prefix? This present description, were it extended to an examination of other West Atlantic and Mande languages, might provide the answers to these questions.

Another question that should be asked is how widespread is this phenomenon in the Niger Congo languages, and can /N-/ be related to the prefix system of proto-Niger-Congo? The answer may shed some light on the genetic relationships within the Niger-Congo language family.

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