

ON THE NATURE OF THE BAMBARA TONE SYSTEM

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1. Introduction

Mandekan is a cover term for a language complex including, among others, Bambara, Dyula, Guinean Maninka and Gambian Mandinka, which are spoken over a wide area of mostly Francophone West Africa. Bambara, Dyula and Maninka are mutually intelligible; Mandinka seems to be less closely related.¹

One or another of these languages is frequently quoted in the literature as illustrating a peculiar sort of tone system, differing in kind from those found in other West African languages such as Yoruba or Twi. Nancy Woo [1969] has called Bambara a 'tone harmony' or 'pitch accent' rather than a lexical tone language. William Leben [1973] has used Maninka (and to some extent Bambara) as an illustration of a language in which tone is suprasegmental, that is, one which does not have segmental tone features in underlying lexical representations. He claims that the same suprasegmental tone patterns can be mapped onto the segments of Mandekan words regardless of the number of syllables in the words. Further, Mandekan supposedly has a tone rule which must refer to suprasegmental tones or suffer loss of generality.

The reasons for such conclusions are two. The first is the general belief that Mandekan has an extremely limited number of lexical tone patterns: two or perhaps three. Therefore, as William Welmers [1949] pointed out concerning Maninka, tone can be regarded as a property of the whole morpheme, rather than of the individual syllable or tone-bearing segment. The second is the existence of a rule for noun compounds (which includes noun + adjective(s)) by which the tone of the first noun determines the tone of the whole compound. Nancy Woo compared this rule to one of vowel

¹My principal informant for this study has been Sori Kulubali (Ibrahima Coulibaly) of Bamako; others who have been very helpful in my general study of Bambara are Goundo Magassa de Thandt, Cheickna Singaré, Ousmane Macalou, Mamadou Koita and Mariame Sidibe Sy. Mistakes are, of course, my own.

harmony.

I am challenging both Woo's and Leben's conclusions on the grounds that they are based on incomplete and therefore misleading data, for Bambara at least. It is possible, however, that their claims may hold up for other parts of Mandekan.

2. Lexical tone

Charles Bird [1969] has presented a good outline of the general way in which tone works in Bambara. It is not necessary to review this here, since the characteristics of terraced-level languages are well known.

However, all the facts of lexical tone in Mandekan, or at least in Bambara, cannot be learned from the literature to date. Scholars writing on these languages, including Bird, have dealt with only two, or at the most three, of the tone patterns found in lexical items. Welmers [1949] states that Maninka has one-, two-, and three-syllable words. There are only two tone patterns in the one- and two-syllable words: all-low or all-high; the three-syllable words can have either of these or a third pattern: low-high-high. Rowlands [1959] and Spears [1966, 1968] also mention only these three lexical tone patterns for Mandinka and Maninka respectively. Bird, writing on Bambara in 1966 and 1968, deals with only two patterns, all-low and all-high.

It is therefore easy to see why Leben, given only this information, should have concluded that Mandekan lexical tone could be treated in one of two ways. If there were in fact only two tone patterns possible for a lexical item, it could be assigned one of two underlying suprasegmental contours which could later be mapped onto the separate vowels. If there were in fact three, each word could be marked with a diacritic feature which would specify which vowel would be assigned the first high tone. This last solution would be possible because by Leben's analysis all words contain at least one high tone. All final tones previously considered as underlyingly low have been reanalyzed as high; e.g., LLL is LLH for Leben (and for me as well, since I agree with him on this point). This will be discussed in detail below.

I have no first-hand experience with Maninka or Mandinka, and therefore cannot quarrel with the statement that they have only three tone

patterns in lexical items. It definitely is not the case, however, that Bambara has only three. In view of the conclusions which have been drawn by several scholars from this erroneous assumption, I will illustrate this point in (1) where occurring (and non-occurring) tonal patterns for a Bamako dialect of Bambara are given.² (The supporting data for this display can be found in Appendix I.)

(1) <u>Number of syllables</u>	<u>Tone patterns</u> ³			
1	H	LH	L	
2	HH	LH	(LL)	
3	HHH	LLH	(LLL)	
	HHL	LHH	(HLL)	
	HLH	LHL		
4	HHHH	LLLH	(HHHL)	(HLLH) (LHHL)
	HHLH	LLHH	(HLLL)	(LLLL)
	HLHL	LLHL	(HHLL)	(LHHH)
		LHLH	(HLHH)	(LHLL)
5	HHHHH	LLHHH		
6		LLLHHH		

(non-occurring patterns are shown in parentheses)

The Bambara language has many words borrowed from Arabic and French. In general the Arabic loans occurred earlier; however, a considerable part of the Bambara population has been Islamized quite recently, and Islam is still in the process of spreading to other Bambara communities not now Muslim. It is possible that some Arabic loans are quite recent. The French

² Ségou Bambara tone is no less complex, but somewhat different. It will not be dealt with here in the interest of clarity.

³ [1] can be tone bearing where a vowel has been lost, as in the words tîé (from tîié) 'day' and fîé (from fîié) 'look at'. Such words are still two-syllable, in spite of the loss of a vowel. The difference between one- and two-syllable words can most easily be heard in LH nouns followed by the 'definite article' realized only as low tone: they have quite different stress patterns:

sâ [˩]

sâgù [- ˩]

tîé [˩]

tîé [- ˩]

This difference is maintained even when a consonant is lost, as in some dialects' version of 'sheep': sâé.

loans have been taken into Bambara in the last eighty years for the most part. The fact that many Arabic and French loans have 'non-basic' (i.e., not H or 'rising') tone patterns would indicate that these patterns are still productive in Bambara, at least for borrowed words.

Loanwords exist with most of the tone patterns I have listed (blanks in the list below indicate patterns not occurring in my data):

(2)	<u>Arabic</u>		<u>French</u> ⁴		
1a.	H	---	bi	'soccer goal'	
b.	LH	---	nɔn	'bridge'	
c.	L	---	---		
2a.	HH	jinyɛ	'world'	siman	'cement'
b.	LH	hakɛ	'wrong'	kuran	'electricity'
c.	HL	Awa	'Eve'	komi	'like, as'
3a.	HHH	lahara	'afterlife'	sinuwa	'Chinese'
b.	LLH	kibaru	'news'	tabali	'table'
c.	LHL	Dawuda	'David'	peteti	'perhaps'
d.	HLH	miseli	'needle'	buteli	'bottle'
e.	LHH	atayi	'tea'	lekoli	'school'
f.	HHL	Amadu	(name)	---	
4a.	HHHH	madarasa	'Muslim school'	limonati	'lemonade'
b.	LLLL	jahanama	'hell'	alimeti	'match'
c.	LHLH	lagansara	'a prayer'	---	
d.	LLHH	mutukali	'gold measure'	dogotoro	'doctor'
e.	HLLH	---	---	---	
f.	LLHL	Isiyaka	'Isaac'	---	
g.	HLHL	---	---	---	
5a.	HHHHH	---	---	gofranaman	'government'
b.	LLHHH	---	---	---	
6.	LLLHHH	---	---	---	

Other tone patterns exist for which I have only a single example, e.g. HLLHL salonnasini 'year before last', LLLLLH kirikirimashiɔn 'epilepsy'. There are undoubtedly others which I have not yet discovered. The very fact that there are so many tone 'patterns' (cf. (1) and Appendix I) would seem to indicate that the concept of Bambara tone as a property of the word as a whole is not very useful.

At a very rough guess, about 85% of the Bambara lexicon is either H or 'rising', but that does not let us escape the fact that there are hundreds of words in the language which do not fit these patterns, that they are part of the language and must be accounted for, and that they are subject

⁴Cf. Appendix II.

to the tone rules of the language and must be able to function as inputs to those rules. Certainly those words which do not fit the 'basic' patterns cannot reasonably be dealt with by assigning them a suprasegmental pattern and then mapping this onto the vowels. Each vowel would better have a tone assigned to it in the lexicon.

That some 85% of Bambara words do have one of two tonal configurations is an interesting fact which should be expressed in the lexicon; but not, I think, by making tone suprasegmental in that part of the lexicon and segmental in the rest. Although by no means are all the possible tone combinations present in Bambara (and indeed tone combinations are completely free in few tone languages), enough are present so that every vowel must be specified for tone. Nothing would be gained by specifying all words not fitting the 'usual' patterns as [+ideophonic], [+foreign] or [+proper], simply because they are in a minority. Nor do any of my informants seem to feel that these words are in any way 'deviant'. Bambara may be in state of transition from a segmental tone language to a suprasegmental one; but, if so, the changeover is still far from complete. In the meantime Bambara will have to be considered a lexical tone language.

3. Tone-spreading

Most scholars writing on Mandekan have considered the language to have two basic tonal patterns: all-high and all-low (with low-high-high added by some). In Leben's formulation there are no all-low words. Instead there are words with a 'rising' tone pattern: LH sa 'snake', LH fini 'cloth' and LLH kurusi 'pants'. Words of this tone configuration can be considered to have either 'all-low' or 'rising' as their underlying pattern, since they are 'all-low' before a high tone or before pause, and 'rising' before a low tone as in (3).⁵ (In the following examples, ' indicates low tone, ' high tone. Bambara is a terraced-level language, but downstep will not be indicated after low, where it is automatic. Adjacent vowels will be shown uncontracted.)

⁵Cf. Appendix III.

(3) <u>Before pause</u>	<u>Before high tone</u>	<u>Before low tone</u>
Ṇ yé á kùnún.	Ṇ yé á kùnún dé!	Ṇ yé á kùnún wá?
'I swallowed it'	'I swallowed it!'	'Did I swallow it?'
À té yán.	À té yán sfsán.	À té yán bí.
'It's not here'	'It's not here now'	'It's not here today.'

If the 'all-low' pattern be considered basic in such words, then their behavior before a low tone would be a case of dissimilation, going so far as to add a high tone to the underlying low tone in the case of one-syllable words. As Hyman and Schuh [1974] note, however, cases of dissimilation are rare in tone as they are in other areas of phonology. If the 'rising' contour is taken as basic, on the other hand, the all-low variation before high results from rightward spreading and absorption, two diachronic tone rules which Hyman and Schuh have shown to be very common in tone languages. Tone spreading is a kind of perseverative assimilation, whereby a tone continues into the domain of a following tone. In the case being discussed here, a low tone perseveres into the domain of a high one, producing a rising tone:

(4) ... kùnún dé → ... kùnún dé ... yán sfsán → ... yán sfsán

The first high tone is then absorbed into the second one:

(5) ... kùnún dé → ... kùnún dé ... yán sfsán → ... yán sfsán

'Absorption' is a kind of spreading which takes place when a rising or falling tone is immediately followed by a tone which is the same as the end of the contour tone: that is, H after a rising tone and L after a falling tone. Synchronically, the intermediate stage with the contour tone never appears in Bambara. The tone change can be accomplished directly in one shifting rule (this rule does not apply within a word, and there are other limitations on its applicability which will be discussed below):

(6) H → L / L ___ $\left\{ \begin{array}{l} H \\ \# \end{array} \right\}$

(The Loss of the high tone before pause probably has a different historical origin, namely in the tendency of high tones in many languages to lower

before pause.)

Leben's reformulation of the 'all-low' words as 'rising', then, is supported strongly by what is known about natural tone processes. As Paul Schachter has pointed out (personal communication), the analysis of such words as 'rising', combined with the spreading rule, helps to explain many of the gaps in the chart of occurring tone patterns in (1), i.e., the lack of patterns with final LL. This comprises all the gaps in two- and three-syllable words, and four out of the nine in four-syllable words. If there were at some time in the history of the language words ending in LL, they would in most contexts have fallen together with words ending in LH, since the latter are LL in all contexts save that of a following low tone. Perhaps 'rule inversion' then occurred, with LH words reinterpreted as LL and a new rule $L \rightarrow H / L _ L$ established. There would then have been no contrast between underlying LL and LH, as is the case today with the exception of one-syllable words. Other gaps in the tone patterns are probably inexplicable, at least with our present knowledge; see Appendix I, footnote 4 for further discussion of this point.

Leben goes on to show that in Maninka the tone-spreading rule is quite general. In Bambara, however, it is considerably less so. In both languages the rule applies in the following cases: final syllables of 'rising' words, H tense markers, and H copulas. Maninka, though, also applies the rule to H verbs in final position, H quantifiers, and H postpositions. The following examples will illustrate applications of the rule in the two languages (Maninka examples from Spears [1968]):

(7) a. Maninka

À yé yéíé -lá --> À yé yéíé-lá
 he pres. laugh 'He is laughing'

Bambara

À bē yéíé -lá --> À bē yéíé-lá
 'He is laughing'

(Here the Maninka rule applies to verb and tense markers; the Bambara rule only to the latter.)

b. Maninka

wò dó --> wò dó
that some 'some of that'

Bambara

ò dó --> ò dó
'some of that'

(Here the Bambara rule does not apply to the pronoun 'some'; the Maninka rule does.)

c. Maninka

À bǎrá lǎ kúnúŋ --> À bǎrá lǎ kúnúŋ
He past caus. wake 'He was awakened'

À bǎrá lǎ kúnúŋ --> À bǎrá lǎ kúnúŋ
It past caus. swallow 'It was swallowed'
pass.

Bambara

À lǎ kúnún -ná --> À lǎ kúnún -ná
He caus. wake past 'He was awakened'
pass.

À (lǎ) kúnún -ná --> À (lǎ) kúnún -ná
It caus. swallow past 'It was swallowed'

In example (7c) after the application of the rule, the Maninka sentences are distinguished solely by the tone of the causative marker *la*, while Bambara still distinguishes them by the tone of the verb. In Bambara only the tense marker is affected by the rule.

Maninka apparently has no contrast between high and low verbs in certain contexts:

(8) Maninka

À bó -rá --> À bó -rá
He go past 'He went out'
out

À fùá -rá --> À fùá -rá
He die past 'He died'

But compare the two sentences in Bambara:

(9) À bó -rá --> À bó -rá
He go past 'He went out'
out

À fǎgá -rá --> À fǎgá -rá
He kill past 'He was killed'
pass.

Bambara has minimal pairs for verbs in this context as well as all other contexts:

- | | | | |
|------|--|-----|--|
| (10) | À bǎn -nǎ
It end past
'It ended'/'He died' | vs. | À bǎn -nǎ
He refuse past
'He refused' |
| | À yé ð sùsù
He past it suck
'He sucked it' | vs. | À yé ð sùsù
He past it pound
'He pounded it' |

My Bambara informants reject the idea that such sentence pairs can be said alike except in one case: when an intonation expressing 'assertion with finality' is being used. Much remains to be learned about the interrelationship of tone and intonation in Bambara.

Although the Bambara tone spreading rule is less general than the Maninka rule, it clearly supports Leben's reanalysis of the all-low words as 'rising.'

4. The 'Noun-Compound' Rule

Leben, working with limited data, concluded that the suprasegmental nature of Maninka and Bambara tone is demonstrated by the existence of a rule which treats the tone patterns of words as suprasegmental entities. This is the tone-spreading rule as applied to noun compounds. I will show that this rule cannot in fact apply to such compounds, at least in Bambara: the true noun-compound rule lends no support to the idea that Bambara tone is not segmental.

As Leben says, the noun-compounds of Bambara work as follows (but only as far as the H and 'rising' words are concerned, as we shall see):

- (11) a. If the first word is H, then every vowel of the compound is H.
 b. If the first word is 'rising', then all vowels preceding the last word in the compound are L, and the last word is H.

Examples are given in (12):

- (12) a. yírf + sùrdnmán + nfn --> yírfisùrdnmánfn
 tree short one small 'very short tree'
 b. dùté + fínmán + dómán --> dùtáfínmándómán
 tea black one good one 'good black tea'

Leben points out that this rule is only a description of compound tone in Bambara, not an explanation. Any other rule would seemingly make just as much sense. Leben's explanatory rule is as follows:

- (13) a. Copy the last tone of the first word onto all noninitial words in the compound.
 b. Perform tone spreading: $H \rightarrow L / L \text{ ___ } H$ iteratively.

If this rule is applied to segmental tones, the output is wrong in (12b) as seen in derivation (14):

- (14) dúté-finmán-dómán
 L H H H H H by (13a)
 L L H H H H
 L L L H H H }
 L L L L H H by (13b)
 L L L L L H

By interpreting the rule as applying to suprasegmental tones, one obtains the correct results (in this instance):

- (15) LH
 dute- finman- duman
 LH H H by (13a)
 dute- finman- duman
 L H H }
 dute- finman- duman by (13b)
 L L H
 dute- finman- duman

This ingenious solution, though, often fails when the initial word in a compound is one of the words with 'non-basic' tone. Of course, Leben had no way of knowing about most of these words; and his solution would have worked for the LHH words, which he was aware of. Part of his 'explanation' of the noun-compound rule, however, seems to rest on the idea that the whole compound reproduces the underlying tone of the first noun; and this would not be true of the LHH nouns any more than for the other words with 'non-basic' tone.

In fact, the tonally 'irregular' words when initial in a compound change their tone to that of their initial vowel; the last word is H, and any intervening words take the tone of the first one. My rule, which

follows, works for Bambara words of any tonal configuration:

- (16) CRa. All vowels of the last word in a compound are high.

$$\left[\begin{array}{c} \left[\begin{array}{c} \text{V...} \\ \text{---} \end{array} \right] \\ \text{NC} \end{array} \right] \rightarrow +\text{H}$$

- CRb. All other vowels in the compound are the same tone as the first vowel.

$$\left[\begin{array}{c} \text{V} \\ \text{aH} \end{array} \quad \text{V...} \quad \left[\quad \right] \right]_{\text{NC}} \rightarrow \text{aH}$$

Examples follow:

- (17) a. bloodsucker- big one- big

mɪrɪkɪtɪf- bəiəbəiə- bə

H by CRa

L L L L L L L L by CRb

'very big bloodsucker'

mɪrɪkɪtɪbəiəbəiəbə

(By Leben's rules this would come out mɪrɪkɪtɪbəiəbəiəbə since the tone spreading rule would not apply to a high tone followed by a low.)

- b. afternoon prayer- long one- big

səiɪfáná- jánmánján- bə

H by CRa

H H H H H H H by CRb

'very long afternoon prayer'

səiɪfánájánmánjánbə

Thus the entire tonal shape of a compound can be predicted by the tone of the first vowel of the first member of the compound. This solution is unfortunately not explanatory; nor does it neatly fit in with the tone-spreading rule which is needed elsewhere in Bambara, but it does fit the facts and does not introduce unnecessary false steps.

Leben remarks that his compound rule could be restated to apply cyclically to bracketed forms if iterative phonological rules are not allowed. In fact, bracketing is independently motivated for Bambara compounds because

of forms like the following:

- (18) kàrà̀mò̀gò̀kù̀ntfǫ̀ 'principal' which is from
- | | | | | |
|----------|-----------------------|---|-------------|-----------|
| kàrà̀(n) | 'teaching' | } | kàrà̀mò̀gò̀ | 'teacher' |
| mò̀gò̀ | 'person' | | | |
| and | | } | kù̀ntfǫ̀ | 'leader' |
| kù̀n | 'head' | | | |
| tǫ̀f | 'owner,
possessor' | | | |

By either Leben's or my rules, a bracketing like $[[kàrà̀][mò̀gò̀][kù̀n][tǫ̀f]]$ would produce the wrong results as in (19):

- (19) $[[kàrà̀][mò̀gò̀][kù̀n][tǫ̀f]]$
- | | | |
|-----------|-----|--------|
| | H H | by CRa |
| L L L L L | | by CRb |
- *kàrà̀mò̀gò̀kù̀ntfǫ̀

But a different bracketing as in (20) produces the desired output:

- (20) $[[[kàrà̀][mò̀gò̀]][[kù̀n][tǫ̀f]]]$
- | | | | | |
|---------|-----|---|-----|--------|
| | H H | | H H | by CRa |
| L L | | L | | by CRb |
| | | H | H H | by CRa |
| L L L L | | | | by CRb |
- kàrà̀mò̀gò̀kù̀ntfǫ̀
- (after the first application of CRa & b, the intermediate kù̀ntfǫ̀ is treated as one word)

- (21) sènnúnkún: 'tip of the foot', which is from
- | | | |
|------|--------|---|
| sè̀n | 'foot' | |
| and | | |
| nún | 'nose' | } |
| kún | 'head' | |
- 'tip'

$[[sè̀n][nún][kún]]$ would produce sènnúnkún, which is wrong.

The correct bracketing must be $[[[sè̀n][[nún][kún]]]$.

The noun-compound rule is apparently responsible for the idea put forth by Nancy Woo that Bambara is a 'tone harmony' language, analagous

to a 'vowel harmony' language in that the tone of the first word determines the tone of the whole compound. I think that the importance of this rule has been greatly exaggerated by several scholars, at least as far as its influence on the tonal character of the language is concerned. It is actually a very restricted rule, applying in few contexts; not all noun compounds follow the rule. It applies in one case where no noun compound is involved.

The rule does apply in the following cases:

- (22) a. Most nouns derived from combinations of other nouns.
 kǎrś + mǔś --> kǎrśmǔś
 'elder sibling' 'woman' 'elder sister'
- b. Nouns derived from various combinations of word classes + derivational suffix.
 kǎgś + kǎ + lǎn --> kǎgśkǎlǎn
 'salt' 'put' 'instrumental' 'salt shaker'
- bǎn + ń + kǎn + lǎ + kǎ + lǎ --> bǎnhkǎnlǎkǎlǎ
 'fall' 'me' 'on' 'gerund suffix' 'do' 'agent suffix' 'mugger, highwayman'
- c. Certain other nouns derived from noun + verb:
 kś + bǎlǎ + nyǎ --> kśbǎlǎnyǎbǎlǎ
 'back' 'put' 'front' 'open-sided shirt'
- d. Verb + adverb phrases derived from noun + verb:
 śǎbǎkǎrś + bǎgś --> śǎbǎkǎrśbǎgś
 'seriousness' 'beat' 'beat seriously'
- e. Noun + 'adjective(s)', where the adjective is actually a noun derived from an adjective-verb (like 'to be red') + a nominalizing suffix:
 cǎ + nyǔmǎn (from nyǎ + -mǎn) --> cǎnyǔmǎn
 'man' 'good' 'be good' 'nominalizing suffix' 'good man'
- (-bǎ 'big' and -ńǎ 'small' are two other adjectives which follow this rule)

The rule does not apply in the following cases involving nouns:

- (23) a. Some nouns derived from combinations of nouns.⁶
 mǝgǝ + fú + fǝ + fú --> mǝgǝfúfǝfú
 'person' 'nothing' 'father' 'nothing' 'hereditary good-for-nothing'
- b. Certain nouns derived from noun + verb or 'identifier'.
 cĕ + tĕ + mǝsǝ --> cĕtĕmǝsǝtĕ
 'man' 'is not' 'woman' 'homosexual'
- c. Noun + demonstrative.
 mǝsǝ + nĭn --> mǝsǝ nĭn
 'woman' 'this' 'this woman'
- d. Noun + numeral.
 fǝbúrǝmǝ + fǝfǝ --> fǝbúrǝmǝ fǝfǝ
 'purple potato' 'two' 'two purple potatoes'
- e. Nouns in apposition.
 dĕnyĕrĕnfĭn + kǝsǝlǝbǝ --> dĕnyĕrĕnfĭn kǝsǝlǝbǝ
 'baby' 'big cryer' 'baby (which is a) big cryer'
 (itself a compound)
- f. Nouns in possessive phrases.
 súnǝgúrĭn + sĕn + ' --> súnǝgúrĭn sĕn
 'girl' 'leg' 'definite article' 'the girl's leg'

It can now be seen that the 'noun compound' rule does not simply erase the underlying tones of the non-initial words of any noun phrase in the language. I am afraid that one can get just that impression from incomplete accounts of the rule. Bambara is perhaps a little further along the way to becoming a 'tone harmony' language than, say, Igbo, which has a rather more complicated tone rule involving nouns. It may have an overwhelming majority of words with two tone patterns. But it is still at this point in time a lexical tone language, in which tone must be represented as a feature on segments; and as I have shown, it is not in fact very different from other West African tone languages.

⁶All tone changes in (23), such as mǝgǝ to mǝgǝ in (a) and nĭn to nĭn in (c), result from the tone shifting rule (6).

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Appendix I

Examples:



	a. H		b. LH		c. L
1. nouns	ba ₁ san ₁	river sky	ba san	goat year	(none)
verbs	di si	give grind	di si	shave spend the night	(none)
misc.	ye ka	completive subjunct.	tun u	perfective 3rd pl. pro.	ka a inf. mrkr. 3rd sg. pro.
	a. HH		b. LH		c. HL ²
2. nouns	fini kɔɔ	fonio stomach	fini kɔɔ	cloth bird	kunun Saran yesterday (name)
verbs	kunun tugu	wake up close	kunun tugu	swallow follow	(none)
misc.	mana pewu	if completely	joli kana	how much? subjunct. negative	sani wali before or

¹A word final *n* in the orthography means that the preceding vowel is nasalized: don [dɔ̃] 'enter'. Before an [o], word-final *n* is [ŋ]: sɔn ó sɔn [sɔn ó sɔ̃] 'every year'. Word-medial *n* is homorganic with a following consonant: kɛnɪŋgɛ [kɛnɪŋgɛ] 'kind of millet'. Tone-bearing syllabic nasals are also homorganic with a following consonant: N bɛ tɛ́ [n bɛ tɛ́] 'I will go'.

²HL words are phonetically high-falling before a H and high-downstep (?) before a L: (data from pitch extractor)

134 hz Sǎrɛn tɛ́ 'It's not Saran' Sǎrɛn dɔn 'It's Saran'
92 hz  

The other phonetic manifestations of L in the two examples above are regular; but the underlined L is anomalous, since the first of two successive L's usually falls slightly rather than being level or even rising slightly as in this case:

140 hz Á wɔ̀rɔ̀kùtùlɛ́ 'It was sprained' Sábà tɛ́ 'It isn't three'
92hz  

Judging from the first tone of the first example just above, I would guess that determining factor for falling or level (including slightly rising?) low tones is word boundary; but a great deal of work remains to be done on

3.	nouns	a. HHH	mininyan	boa	b. LLH	funteni	heat
			keninge	kind of millet		npoliyo	kind of fish
		verbs	tagama	walk		nyininka	ask
		nimisa	regret		nyongirl	kneel	
		tuguni	again		barisa	because	
		walasa	in order to				
	nouns	c. LHL	kunanje	heron	d. HLH	mangoro	mango
			doodo	kind of fish		Misira	section of Bamako
		verbs	(none)			(*)	
		misc.	layila	(exclamation)		(none)	
		laala	perhaps				
nouns	e. LHH	jakuma	cat	f. HHL	Garaba	(name)	
		sabara	shoes		Keyita	(surname)	
	verbs	(*)			(none)		
		misc.	kabini	since		(none)	
	4. ³ nouns	a. HHHH	kulukutu	sphere	b. LLLH	karankafe	sideburns
			menement	ant		peresidan	president
verbs		kucukucu	rinse out		balabala	boil	
		koyokoyo	be ashy		kolonkolon	roll	
	misc.	(none)			(none)		
nouns	c. LHLH	mirikiŋi	bloodsucker	d. LLHH	kalamana	strabismus	
		faburama	kind of potato		karakoro	kind of fritter	

the phonetics of Bambara tone. It should be noted also that for some speakers, at least some of the HL words are HLH: kúnún instead of kúnún. For such speakers the second syllable of a HLH word has a pronounced rise before low tone.

³It is possible to at least guess at a polymorphemic origin for a few of the four-syllable words; but even if the guesses are correct, the tones of the original words have been changed very irregularly, and the four-syllable words cannot be derived from them in any simple way. Examples: babuginin LHLH 'sand castle' from ? ba H 'river', bugu LH 'thatched house', nin H 'small'

fitirinin LHLH 'kind of bat' from ? fitiri LHH 'dusk', nin H 'small'
 kunasini HLHL 'day before yesterday' from ? kunun HL 'yesterday',
 sini HH 'tomorrow'

verbs	wurukutu nemememe	sprain do slowly	kiskasa kolokala	reel stroll
misc.	(none)		(none)	
nouns only	e. HHLH fogonfogon gergerer	lung continuous bad luck	f. LLHL Malisajo Molobali	(name) (name)
nouns only	g. HLHL kunasini ncincokinc	day before yesterday (in expression 'didn't say <u>any</u> <u>thing</u> ')		
5. nouns only	a. HHHH gofranaman kartidante	government identifica- tion card	b. LLHHH kengenkokooyo nponponpogolo	mumps elephantiasis
6. nouns	LLLHHH ^h mlikimalaka kolobokalaba	zigzag carelessness		

^hThis particular tone pattern seems to be similar in meaning to the Yoruba ideophonic pattern High Mid Low Mid denoting 'irregularity' or 'deviation from the norm'. William Leben (personal communication) has stated "the fact that words like mlikimalaka and kiribikaraba are composed of two parts that are partial copies of each other, and that the first part has a level L while the second has a level H makes the notion that Bambara tone is completely lexical (i.e. associated with individual segments or syllables) a little difficult to believe unless there is some other reason to believe that tone patterns like LHLHLH don't occur on words of this sort." It is, however, quite common for ideophones to have restricted tone patterns and to have sections which are partial copies of each other. In Yoruba, for example, the type mentioned above with the tone pattern HMLM (e.g. kpɛtɛkpɛtɛ 'muddy', yalaya 'in shreds') has a very specific and inexplicable tone pattern; there are no ideophones with the patterns LMHM, HLLH or MHML, for instance, though there is no obvious reason why there shouldn't be. Another Yoruba type is kɔrɔbɔt 'fat', fɛrɛgɛdɛ 'broad' where the first and third consonants must be -coronal, the second r and the fourth +coronal; the tone must be all low. An explanation for this would be very difficult to find. Yoruba also restricts the initial tone of vowel-initial nouns to low or mid. I have never heard anyone advance the hypothesis that Yoruba is not a lexical tone language; indeed, I think such restrictions are normal for tone languages. Sometimes they can tell us something about the history of the tone system, as in the case of the lack of distinction between final LL and final LH in most Bambara noun types; sometimes they are beyond our competence to explain, at least at this stage of linguistic knowledge.

verbs kiribikaraba be worthless
 ɲanamɔɲanamu act restless

misc. (none)

(*) indicates tone patterns which appear in verbs only when the verb can be analyzed as verb + prefix: HLH la-jigin 'lower' from LH jigin 'descent'; LHH mən-dimi 'hurt (place already injured)' from HH dimi 'hurt'. Such prefix + verb combinations also produce other tone patterns which are usual for verbs without prefixes: HHH la-cinyɛ 'cause to spoil' from HH cinyɛ 'spoil'; LHLH mə-jigin 'submit' from LH jigin 'descent'; LH mə-da 'submit' from H da 'lie down', etc. It might be better in some cases to consider the L mə(n)- prefix as simply the first syllable of a verb, where the original verb cannot be identified: LHLH mən-to 'be quiet' from ? LH *to.

Some tone patterns are restricted to certain kinds of morphemes. Several are restricted to nouns, and 3f (HHL) and 4f (LLHL) to proper nouns. Words of pattern 5a (HHHHH) are borrowed from French. Patterns 4g (HLHL) and 5b (LLHHH) are rare, at least in my data. Most nouns of pattern 3d (HLH) have an alternate pronunciation of HHH in this dialect; perhaps the HHL versions are dialect borrowings from Ségou.

Appendix II

The tone of Bambara words borrowed from French is little understood, and is currently under investigation by the author. Preliminary findings are these:

- a) French loans in Bambara often have more syllables than the French originals, because of epenthetic vowels added between consonants (except clusters with l or r, where the l or r becomes tone-bearing in Bambara) or after final consonants.
- b) French words may be borrowed with their definite or indefinite articles: LHH lecoli 'school' from l'école, LH dute 'tea' from du thé. Whole French phrases may be borrowed as one Bambara word: LLHH latikolon 'cologne' from l'eau de Cologne, HHHHH kartidante 'ID card' from carte d'identité. In such cases, unstressed particles in French are usually L in Bambara.

- c) There is some tendency for monosyllabic French words to be borrowed as H: bi 'soccer goal' from but, kɛsu 'box' from caisse, letri 'letter' from lettre. But there are many LH: trɛn 'train' from train, ɔbu 'dress' from robe, zu 'yoke' from joug. There are even some HL: komi 'like, as' from comme.
- d) Two-syllable French nouns tend to become LH in Bambara: balon 'ball' from ballon, kaye 'notebook' from cahier, butigi 'boutique' from boutique. Again, however, there are many exceptions: (H) nilon 'nylon' from nylon, biye 'ticket' from billet, simisi 'shirt' from chemise; HLH buteli 'bottle' from bouteille.
- e) Longer French words tend to become H in Bambara: siniman 'movie' from cinéma, isamen 'examination' from examen, kapitalisimu 'capitalism' from capitalisme. There are still exceptions: LLLH alimeti 'match' from allumette, LLH mangasa 'store' from magasin, LLHH politigi 'politics' from politique.
- f) Some French words are borrowed without their initial syllables: HH sansi 'gasoline' from essence, LH pranti 'apprentice' from apprenti, HH taari 'hectare' from hectare.
- g) Some French borrowings have different tones for different speakers of the same dialect: HHH or LLH mobilii 'car' from (auto-)mobile, HH or LH klasi 'class' from classe.

So far, at least, the tones of borrowed words shed very little light on the nature of Bambara tone in general, besides confirming the fact, already known, that there is a connection between stress and high tone in this language as in many African tone languages.

Appendix III

It has long seemed odd to me that nearly all Bambara words should end in an underlyingly H tone. One would not expect any suffix that this might be the remnant of to apply to more than one word class. My hypothesis is that the H ending may have started historically as some sort of noun suffix (since noun class suffixes are widely attested in Niger-Congo, while verb suffixes are not), and have later spread to verbs and other word classes when the contrast between final LH and LL was blurred by spreading rules.

I have just learned from William Welmers (personal communication) that in Liberia there is a language related to Bambara called Manya, in which most tones are the reverse of Bambara tones. Most nouns cognate with Bambara LH nouns are HL in Manya, while Bambara LH verbs are H in Manya. This fact may indicate that the reversal of tones in Manya took place before the hypothetical H noun suffix had spread to other word classes. (Monosyllabic nouns are, however, exceptions in that Bambara LH corresponds to Manya H, as in verbs.) Examples:

Bambara	Manya	English gloss
(verbs)		
dá	lǎ	'lie down'
táá	tǎá	'go'
nǎ	nǎ	'come'
súnyá	súnyá	'steal'
(nouns)		
túúú	túúú	'oil'
bóíó	bóíó	'hand'
jí	jí	'water'
sú	sú	'night'
bámá	bámá	'crocodile'
jǎíǎkǎ	jǎíǎkǎ	'chain'
<u>but</u> sǎ	sǎ	'snake'
jé	jé	'pumpkin'

