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AN ALTERNATIVE TO LEXICAL INSERTION FOR YORUBA
COMPLEX NOUNS*

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In the standard theory of transformational generative
grammar lexical insertion takes place in phrase structure
before any transformational rules apply. In Yoruba,
complex nouns can be formed very productively by processes
which frequently involve application of well-accepted
syntactic transformations. Since these noun forming
processes are infinitely productive, nouns so-formed can-
not all be entered in the lexicon. It is proposed that
one of the rewrites of NP include noun complexes (Nc),
i.e. syntactic structures to which transformations
apply, followed by a non-transformational process of
"amalgamation" which turns the derived structure into a
noun. This proposal preserves the essential claims of
the standard theory and avoids the pitfalls of lexical
decomposition proposals.

1. Introduction

The standard theory of transformational grammar demands that all lexical

insertion take place in a block in the syntactic deep structure, and before

any syntactic transformation operates. This requirement raises some problems

in Yoruba syntactic structure. In Yoruba, some word derivation prefixes can

be used to derive single words from almost any verb phrase regardless of the

complexity of its internal structure. At least, one of these prefixes de-

rives nouns from almost all possible verb phrases. Since most of the verb

phrases used as stems for noun derivation are obtainable only after the

operation of true syntactic transformations like deletion, adjunction and

replacement for reflexivization, relativization, etc., it is difficult to

decide on how to place the prefixes. Should they operate for noun derivation

only in the deep structure before all true syntactic transformations
apply, thereby excluding the possibility of lexical insertion for an in-
finite number of derived nouns, or are there alternative proposals?

Chomsky's statements on what the standard theory is, on what a lexical
transformation is, and the requirement that lexical insertion take place
in a block before any true syntactic transformation operates are now
respectively stated as (1), (2), and (3):

(1) "A standard theory specifies, for each sentence, a syntactic
     structure $\Sigma = (P_1, \ldots, P_i \ldots, P_n)$ (where P_i is the deep,
     and P_n the surface structure), a semantic representation S,
     and a phonetic representation P. It asserts furthermore that
     S is determined by P_i and P by P_n under the rules of semantic
     and phonological interpretation, respectively. More generally,
     the theory is 'syntactically based' in the sense that it
     assumes the sound-meaning relation (P, S) to be determined by
     Σ."
                                                    Chomsky [1971:185]

(2) "A lexical transformation associated with the lexical item I
     maps a phrase-marker P containing a substructure Z into a phrase-
     marker P' formed by replacing Q by I."
                                                    Chomsky [1971:184]

(3) "Given $(P_1 \ldots, P_n)$ in K, there is an i such that for $j < i$,
     the transformation used to form P_{j+1} from P_j is lexical, and for
     $j \geqslant i$, the transformation used to form P_{j+1} from P_j is nonlexical."
                                                    Chomsky [1971:184]

What we state as (1) is generally known as a standard theory or the
Aspects theory. The intermediate point P_i between the P_1 and P_n of Σ in
(1) is the level of syntactic deep structure. Then, (3) implies that P_i
must be the last place where lexical transformations operate since the
transformation used to form P_{j+1} from P_j for $j \geqslant i$ is nonlexical. A
lexical transformation as we can see from (2) is just an instruction that
we replace a substructure Q (cf. the complex symbol of Chomsky [1965:84])
with the lexical item associated with it. One consequence of the suggestion
that "for $j \geqslant i$, the transformation used to form P_{j+1} from P_j is non-
lexical" is that once a nonlexical or true syntactic transformation has
applied, no lexical transformation can again apply.

The implication of this position of the standard theory for Yoruba

shall be discussed in the next few sections. Yoruba has some nominaliza-
tion prefixes like a- (usually an agentive nominalization prefix), ì-
(usually an abstract noun nominalization prefix) and àì- (which is <u>both</u>
a negative abstract noun and a negative gerundive nominalization prefix).
These prefixes derive nouns from verb phrases (hereafter VP) most of which
are obtainable only after the operation of nonlexical or true syntactic
transformations (hereafter transformational or T- rules). The dilemma
now is: should there be another lexical insertion stage where nouns formed
from VP's derived only after the operation of T- rules are inserted, there-
by violating the requirement of the standard theory that lexical insertion
takes place in a block in the deep structure? Or is there any way of
solving the lexical insertion problem without violating this requirement?
One may note that at present, any lexical item that cannot be inserted any-
where in the syntactic structure $\Sigma = (P_1, \ldots, P_i, \ldots, P_n)$ of the standard
theory of generative grammar is not describable by the grammar.

Instead of suggesting another lexical insertion stage apart from the
one at the level P_i of syntactic deep structure (thereby adopting the
multiple lexical insertion policy of the basic theory or of generative
semantics), this paper is proposing an alternative to lexical insertion for
Yoruba complex nouns in the transformational subcomponent of the standard
theory. The lexical amalgamation proposal for complex nouns in section 5
involves, simply, the amalgamation of all the formatives which constitute
the terminals[1] of the last derived phrase marker under a complex noun
category into a single word. A complex noun, for the purpose of this paper,
is defined as one containing verb phrases obtainable <u>only</u> after the opera-
tion of pure nonlexical or T-rules (not derivational constraints). Al-
though it operates inside the transformational subcomponent, lexical
amalgamation <u>is not</u> a transformational rule, and it takes place <u>only</u> on

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[1]From Chomsky [1965:84], we find that the application of categorical
rules ends with the occurrence of preterminal strings which consist mainly
of complex symbols. The terminals are obtained through the use of lexical
transformations which replace the specified syntactic features or complex
symbols that form the preterminal strings with the appropriate lexical form-
atives.

constituents to which no other transformational rule ever applies. Its operation is demonstrated diagrammatically in section 5. Some of its consequences and implications for syntactic theory are stated in section 6.

In section 2 we examine some Yoruba nominalization processes and express them in rule form. Section 3 deals with simple nouns derived through the use of selected Yoruba nominalization prefixes while section 4 sets out the lexical insertion problem arising from the nominalization of syntactically derived verb phrases.

2. Some Verb Phrase Nominalization Processes

Yoruba grammarians have often recognized the productivity of Yoruba nominalization processes. Some typical comments are:

(4)   "Yoruba has an almost unlimited power of making nouns from other
       words."
                                                        Ward [1952:179]

(5)   "For example, _any verb_, adjective, _predicate phrase_, clause or
       clause complex in Yoruba can be nominalized or negatived by
       adding the morpheme àì- as a prefix to the nominalized element."
       (italics supplied)
                                                    Afọlayan [1968:449]

(6)   "Again, the use is made of a- , à- and ì and some features
       of reduplication to nominalize almost _any verb_, adjective,
       predicate phrase, clause or clause complex in Yoruba." (italics
       supplied)
                                                    Afọlayan [1968:449]

Both Ward and Afọlayan recognize the productive capacity of Yoruba nominalization processes as we see from (4) to (6). But only Afọlayan's statement is relevant to this discussion because he spelt out the sources of nominalizations.

Although Afọlayan's statement in (5) and (6) is not strictly accurate,[2]

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[2]Afolayan's statement is not actually accurate because from (5) we find that all adjectives are nominalizable with àì . But Afolayan made a distinction between a class he calls attributive adjectives and another one, predicative adjectives, and only the latter are nominalizable. Hence from his attributive adjectives like títóbi 'big', ńlá 'big' and dáradára 'good' we cannot derive *àìtítóbi , *àìńlá and *àìdáradára respectively. Also, he does not recognize exceptions to nominalizable VP's. But VP's

we may just extract from it the idea that all verbs and verb phrases are nominalizable. /àì/ derives nouns from all verbs and VP's with the exception of VP's starting with the focus markers ni 'is' or 'it is' and kọ́ or kọ́ ni 'is not' or 'it is not' as well as those starting with the progressive aspect auxiliary ń = /ǔ/. Incidentally, all other auxiliary-like elements in Yoruba and pre-main-verb adverbs can start nominalizable VP's. For instance, VP's can start with máa 'be going to', yío 'shall/will', ní 'shall/will' for negative contexts, lè 'can' or 'be able', or with pre-main-verb adverbs (Bamgboṣe's "unrestricted preverbs")[3] like tilè 'even', kọ́kọ́ 'first', kúkú 'rather', tún 'again', ṣèṣè 'just' mọ̀ọ́mọ̀ 'intentionally', etc., and such VP's are nominalizable with the /àì/ prefix. But the listed auxiliary-like elements and the pre-main-verb adverbs themselves are not nominalizable since they are bound in VP structure. So from the VP's in (7), we can have the nouns in (8), but we cannot derive the ones in (9) from the initial VP items alone:[4]

(7) a. ní ṣe   (NEG-shall do)
        'shall not do'

   b. lè máa fẹ́ purọ́   (can be-going-to like-to lie)
         'may be willing to tell lies'

   c. tilè fẹ́ ṣe iṣẹ́   (even want do work)
         'even likes to work'

   d. tètè jalè   (quickly steal)
         'steal quickly'

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starting with focus markers like ni 'it is' or with the progressive aspect auxiliary are not nominalizable.

[3]See Bamgboṣe [1966]. Bamgbose simply treated all VP items before main verbs as "preverbs" and subclassifies them according to order of appearance in surface representation.

[4]Some of our examples are followed by word-for-word glosses in round brackets and actual translations in single quotation marks. When two English words correspond to one Yoruba word in the word-for-word translation, the English words are connected with a hyphen. But the word-for-word glosses do not always necessarily appear. In the representation of Yoruba examples, two tones are indicated. They are: the high tone = ´ and the low tone = ` above the appropriate syllabic nasal or vowel letter. The mid tone is not represented. The underdot is used to distinguish e = [e], o = [o], s = [s] from ẹ = [ɛ], ọ = [ɔ] and ṣ = [ʃ] respectively.

(8) a. àìníṣe   'idleness'

    b. àìlèmáafẹ́purọ́ 'unwillingness to lie'

    c. àìtilèfẹ́ṣiṣé 'unwillingness to work'

    d. àìtètèjalè   'not stealing quickly'

    a. *àìní   *'not being shall'

    b. *àìlè   *'not being can'

    c. *àìtilè *'not being even (Adv.)'

    d. *àìtètè *'not being quickly'

However, from verbs which can constitute single element VP's, i.e. free
verbal items, we derive nouns through the /àì/ operation, e.g.

(10) a. àìpurọ́   'not lying'

     b. àìjalè   'not stealing'

From the preceding discussion, since single verbs can be taken as
single element VP's, the only useful nominalization rule here is one which
derives nouns from VP's and not from verbs (as Afọlayan's statement sug-
gests).

The problem of the progressive aspect auxiliary is easily handled in
relation to the second productive nominalization process which applies
to all verb phrases, that is, Afọlayan's "features of reduplication". The
reduplication of the initial consonant of the verb phrase and the inser-
tion of vowel /í/ on a high tone between the geminate consonant cluster
thereby created leads to the derivation of Yoruba (positive) gerundive
nominals. The /àì/ operation is for the negative variety plus the nega-
tive abstract noun derivation. Since the progressive aspect auxiliary
pronounced /ú̃/ or as a syllabic nasal is not a consonantal sound, it can-
not be reduplicated by the rule which instructs us to double the initial
consonant.[5] And since the positive gerundive nominalization via redupli-
cation is not possible, its negative counterpart via the àì prefixation
is also impossible.

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[5]The Yoruba progressive aspect formative has two alternate forms of
pronunciation: either a syllabic nasal which is homorganic with the following
consonant or the nasalized vowel [ṹ]. The latter explains the exceptions
to Yoruba nominalizable VP's more easily than the syllabic nasal. So, we
choose the nasalized vowel in this work.

One may note that the problematic formative, $\acute{n}$ = /ú/ may occur after other auxiliaries like máa , and that gerundivization by reduplication is possible in such cases, but this is so because the initial element in the VP now is /m/ which is a consonantal sound. Perhaps /máa/+/ú/ = /máaú/ 'to be in the habit of' can be considered as a single auxiliary.[6] This consideration does not affect our discussion here.

From the preceding discussion, it is possible to write the productive rules for noun derivation from VP's. The rules are stated tentatively as (11):

(11) a. $\quad$ N $\quad = \begin{Bmatrix} /ai/ \\ RED \end{Bmatrix}$ + VP

b. $\quad$ RED $\quad = \quad C_1 í/ \quad \underline{\qquad} \quad [_{VP} \ C_1 \ VwX]_{VP}$

$\qquad$ Condition: $\quad$ VP $\neq$ # $\begin{Bmatrix} Vw \\ FM \end{Bmatrix}$ X #

$\qquad$ RED = reduplication
$\qquad$ X $\quad$ = is a variable standing for any syllable or sequence
$\qquad\qquad\qquad$ of syllables or nothing
$\qquad$ FM = focus marker (e.g. ni 'it is')
$\qquad$ C $\quad$ = consonant
$\qquad$ Vw = vowel
$\qquad$ # $\quad$ = is a boundary marker

The condition on (11) takes care of all the exceptions by restricting VP to only those which do not start with vowels or focus markers. So, from there, VP's starting with /ú/ (the progressive aspect auxiliary, which is the only vowel auxiliary) are excluded. Rule (11a) states that a noun is derived from either /àì/ or reduplication plus VP, i.e. from the VP affected by our condition. Then, (11b) says that reduplication is made up of the first consonant of the VP (cf. C_1) plus the vowel /í/ before the whole VP. Since all Yoruba verbs start with consonants (for reasons we do not know), when the verbs are not preceded by auxiliaries or pre-main-verb adverbs in VP's, (11) still covers them.

It should be noted that the word derivation rules in (11) are not yet

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[6]In Ọkẹ [forthcoming], it was suggested that /máań/, i.e. [máa] + [ú], is a single Yoruba auxiliary contrary to the practice of other grammarians, including Ọkẹ at an earlier stage, who regard them as two auxiliaries.

stated as phrase structure rules for which we need rewriting arrows, and
they are not transformational rules. They are word derivation rules as
stated. In section 5, (11a) will be introduced into the categorical sub-
component of grammar. Since (11b) is context-sensitive and does not con-
tain category symbols on the right of the equality sign, it cannot be re-
formulated as a categorial rule. It is actually a phonological rule, so
it cannot apply until all transformational rules have applied. More will be
said about (11) in section 5. But one final point about (11) now is that
the positive abstract noun derivation rule, i.e. /ì/ + VP, is excluded from
our tentative rule, (11), only because it does not apply to all VP's. But
we sometimes refer to it or to its products to give the positive version of
our negative gerundive/abstract noun derivations.

3. Internal Structures of Simple Nominalized VP's

Rules (11a-b) apply to simple monosyllabic verbs as well as complex VP's.
When they apply to simple monosyllabic verbs or adjective-like verbs like
those in (a) to (e) of the table in (12) below for the derivation of minimal
nouns (note that no Yoruba noun is monosyllabic so that a minimal Yoruba
noun is disyllabic), there is no lexical insertion problem since they can
be entered in the lexicon side by side with other nouns (derived or basic).
Also, when they apply to VP's which appear not to be the result of structural
changes of transformational rules, e.g. those in (12f-i) below, there is
no problem since no T-rule has applied so that lexical insertion is still
possible. The noun derivations which create problems are discussed in
section 4.

Some examples of derived nouns using (11) which constitute no problems
in Yoruba syntax are given in the table of (12). We draw up the table to
show the result of rule (11) when it operates and to justify our exclusion
of the (positive) abstract noun prefix from (11). One may note that where
we have asterisks indicating the unavailability of lexical items for ab-
stract nouns in column 2, all the other columns have formatives, and vice
versa (cf. 12ei-ii). Note that where we have no /ì/ + VP abstract forms for
some forms in (12), e.g. in (b), (c), (d) and (eii), there are other abstract
nouns like ọgbọ́n 'wisdom' and orun 'sleep' for (c) and (d) respectively.

It is the existence of these basic, i.e. non-derived, abstract nouns which actually forbids the /ì/ + VP derivation in those places.[7] This is why we have found it difficult to ignore the /ì/ + VP derivation completely in this work.

In (12), PAN = positive abstract noun nominalization, PGN = positive gerundive nominalization through reduplication, NAN + NGN = negative abstract and negative gerundive nominalization, and NE = not exist.

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[7]The main reason why the abstract noun rule is less productive than the negative abstract/gerundive and positive gerundive rule is that we usually have basic (i.e. non-derived) abstract nouns in place of our asterisked items. So, where such exist, the /ì/ + VP rule does not normally derive other abstract nouns. This is why there are more of the asterisked or impossible derivations in places where there are longer VP's. Since Yoruba minimal nouns are disyllabic, minimal (non-basic) abstract nouns must also be disyllabic, and their existence usually forbids the occurrence of derived varieties.

(12) <u>Examples of nouns derived through the rules in (11)</u>

	VP	PAN	PGN	NAN + NGN
a.	fẹ́	ìfẹ́	fífẹ́	àìfẹ́
	'to love'	'love'	'loving'	'not loving'
b.	dára	*ìdára	dídára	àìdára
	'to be good'	NE	'being good'	'not being good'
c.	gbọ́n	*ìgbọ́n	gbígbọ́n	àìgbọ́n
	'to be wise'	NE	'being wise'	'not being wise'
d.	sùn	*ìsùn	sísùn	àìsùn
	'to sleep'	NE	'sleeping'	'not sleeping' or 'sleeplessness'
e.i.	*ṣẹ́	ìṣẹ́	*síṣẹ́	*àìṣẹ́
	NE	'wretchedness'	NE	NE
ii.	ṣẹ́ (igi)	*ìṣẹ́ (igi)	síṣẹ́ (igi)	àìṣẹ́ (igi)
	'to fetch firewood'	NE	'fetching of firewood'	'not fetching firewood'
f.	pa ènìyàn	ìpànìyàn	pípànìyàn	àìpànìyàn
	'kill people'	'murder'	'murdering'	'not murdering'
g.	gbà gbọ́	ìgbàgbọ́	gbígbàgbọ́	àìgbàgbọ́
	'listen and accept' i.e. 'to believe'	'belief'	'believing'	'disbelief' or 'not believing'
h.	dúró ṣinṣin	ìdúróṣinṣin	dídúróṣinṣin	àìdúróṣinṣin
	'stand closely'	'steadfast-ness'	'being stead-fast'	'pusillanimity'
i.	ṣé owó	*ìṣéwó	síṣéwó	àìṣéwó
	'change money' or 'practice prosti-tution'	NE	'changing money' or 'practicing prostitution'	'not changing money' or 'not practicing prostitution'

4. Syntactically Derived VP's as Source for Nouns

We shall limit our examination here only to VP's which have transforma-
tionally derived formatives. The first to be considered is the reflexive
since the formative ara 'self' is transformationally introduced into re-
flexive VP's obligatorily.[8] When the subject and object of a sentence are
coreferential, and the main verb is not copulative in form and function,
the reflexive formative ara 'self' is obligatorily adjoined as the left
sister of the second or repeated NP. This obligatory sister adjunction of
the reflexive formative also converts the second or repeated NP into a
genitive (or an associative) form. The sister adjunction and genitiviza-
tion operations are stated as (13). Sometimes the repeated NP is pronomin-
alized. This second operation on the output or structure change (SC) of
(13) is stated as (14):

(13) SI: $[_S$ W NP $[_{VP}$ AUX X V Y   NP Z $]_{VP}]_S$

             1 2   3   4 5 6   7 8   =>

      SC: 1 2   3   4 5 6ara+7g 8

             (where g = genitive, and W, X, Y, and Z are variables)

(14) SI: $[_S$ W NP $[_{VP}$ AUX X V Y ara NPg   Z$]_{VP}]_S$

             1 2   3   4 5 6 7   8   9   =>

      SC: 1 2   3   4 5 6   7 PRONg 9

             Conditions: (i) Optional

                         (ii) 8 is not a PRON(oun) but it may be a
                              "PRONOM(inal)"[9]

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[8]In addition to its transformational derivation in reflexive struc-
tures, ara 'self' can also occur in the intensive use of the personal
pronoun, e.g. in èmi fúnra mi (I for-self my) 'I myself'. Apart from
this intensive use, ara 'self' is only a transformationally derived
formative.

[9]Bamgbose [1966] made a distinction between "pronouns", i.e. conjunc-
tive pronouns, like mo 'I' and "pronominals", i.e. disjunctive pronouns,
like èmi 'I'. The pronominals have the syntactic characteristics of
nouns, so we can say that they are replaceable with pronouns.

Suppose we have (15a) where both repeated items are coreferential:

(15) a. ?Òjó fẹ̀ràn Òjó   (Ojo love Ojo)
                ?'Ojo loves Ojo'

Then we use (13) to derive:

    b. Òjó fẹ̀ràn ara Òjó   (Ojo love self of-Ojo)

After the application of (14) we obtain:

    c. Òjó fẹ̀ràn ara rẹ̀   (Ojo love self his)
                'Ojo loves himself'

Both (15b) and (15c) are grammatical since rule (14) is optional. The
only crucial rule for us here is (13) which shows how ara is transforma-
tionally introduced. So when reflexive VP's containing this formative are
used for noun derivation through rule (11), we have a lexical insertion
problem.

    Since our main business is with the VP, we shall now ignore sentential
structures like the SI's of (13) and (14). Suppose we now have the trans-
formationally derived VP in (16):

(16)   mọ ti ara ẹni nìkan   (know of self of-one only)
            'look after one's own affairs only'

Then we can use (11a-b) to derive (17a-b) where the transformationally
derived formative ara is underlined:

(17) a. àìmọt_ara_ẹninìkan   'selflessness'
     b. mímọt_ara_ẹninìkan   'being selfish'[10]

Since a true syntactic transformation, the reflexivization rule, has
applied prior to the application of (11) to derive (17a-b), these derived
items now constitute a problem since by (2) and (3) above, they cannot
be inserted anywhere in the grammar. Note that the negative abstract/

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[10]The positive abstract noun version of (17), which is a very common
Yoruba word is ìmọt_ara_ẹninìkan 'selfishness'. This common word con-
tains a transformationally inserted formative (ara) which creates a lexical
insertion problem for a Yoruba generative syntax.

gerundive noun and the (positive) gerundive noun in (17) each constitute just one lexical item (and also an orthographic word) in the Yoruba language. Note also that the Yoruba reflexive transformation is obligatory.

Another Yoruba transformational rule which obligatorily introduces formatives into SC's is the relative. The Yoruba relative marker, tí , is transformationally introduced when certain items in embedded (or constitutent) sentences are coreferential to some elements in matrix sentences. We shall not state the relative as a rule.[11] Instead, we shall draw tree diagrams in (20) showing how (19) is obtained from (18):

(18) $[_{NP}$ ọmọ$_i$ $[_S$ ọmọ$_i$ fọ́ ojú $]_S$ $]_{NP}$ (child$_i$ child$_i$ break eye)

(19) $[_{NP}$ ọmọ$_i$ tí $[_S$ ó$_i$ fọ́ ojú $]_S$ $]_{NP}$ (child$_i$ WH he$_i$ break eye)
       'the child who is/was blind' or 'the blind child'

(20)

If the phrase structure (PS) tree diagram on the left in (20), which represents (18), is considered as the structure index, then the tree on the right, i.e. the PS diagram for (19), constitutes the structure change of a transformational rule. In the SC, the formative tí (REL) has been introduced obligatorily through adjunction to the left of the embedded sentence.

Now consider the VP in (21) where a noun or a NP is needed to replace X:

(21)   fi X̱ gún ọṣẹ   (use X pound soap)
       'use X for preparing soap'.

In place of X̱ in (21) we can insert the whole of (19), i.e. the derived phrase marker in (20), to obtain:

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[11]The relative is discussed in Ẹkundayọ [1972]. The conditions under which the transformationally derived obligatory REL element may be optionally deleted are stated there.

(22) fi ọmọ tí ó fọ́ ojú gún ọṣẹ   (use child REL he break eye pound soap)
      'use a blind child for preparing soap'

Now we can use the whole of (22), which already contains a transformation-
ally derived formative tí (REL), to derive the nouns in (23):

(23) a. fífọmọtófọ́júgúnọ́ṣẹ   'using a blind child for preparing soap'
      b. àìfụmọtófọ́júgúnọ́ṣẹ
          (NEG abstract) 'failure to use a blind child to prepare soap',

          or (NEG gerundive) 'not using a blind child (or blind children)
                            for preparing soap'

    The complex derived items in (23) are nouns because they can be modified
(like nouns) by determiners. For instance, the demonstrative yẹn 'that'
as well as yí 'this' can modify either (23a) or (23b), e.g. àìfọmọtófọ́jú-
gúnọ́ṣẹ yẹn 'that failure to use a blind child to prepare soap'. And they
can function (like nouns) as subjects or objects of verbs, and also as the
objects of prepositions. They are also replaced with pronouns when neces-
sary. We have (23a) as the subject of a verb in (24a), as an object in
(24b), as the object of a preposition in (24c); it is replaced with a pro-
noun in (24d) as the referential indices show, and it is qualified like
nouns by the adjective burúkú 'bad' and the demonstrative yẹn 'that' in
(24e):

(24) a. fífọmọtófọ́júgúnọ́ṣẹ kò dára   '(23a) is not good'[12]
     b. ó jọ fífọmọtófọ́júgúnọ́ṣẹ   'it resembles (23a)'
     c. mo lù ú fún fífọmọtófọ́júgúnọ́ṣẹ   'I beat him for (23a)'
     d. fífọmọtófọ́júgúnọ́ṣẹ$_i$ ni ó$_i$ lé Dèjì lọ ní ìlú
         ((23a)$_i$ is it$_i$ drive Deji go from town)

         '(23a) is what drove Deji out of the town'
         (where coreferential items have the same index)

     e. fífọmọtófọ́júgúnọ́ṣẹ burúkú yẹn ni a ń sọ
         'it is that bad (habit of) (23a) we are discussing'

_____

[12]We shall not repeat the gloss for (23a) in each of (24a-e) in order to
save space. Instead, we shall represent it as (23a); and the full gloss
of each of the expressions in (24) can be obtained by substituting the gloss
for (23a) for the representation (23a) in (24a-e), e.g. (24a) is 'using a
blind child for preparing soap is not good'.

Like (23), the two derived items in (17) (including the abstract noun ìmọtaraẹninìkan 'selfishness' from footnote 10) also behave as nouns in syntactic structure.

Furthermore, only nouns can be modified by nouns in the Yoruba noun phrase. These items are modified by nouns, and their nominal modifiers become genitives or what some grammarians recently have referred to as associatives, e.g. in

(24) f. mímọtaraẹninìkan Adélù   (being-selfish of-Adelu)
          'Adelu's selfishness'

However, (23a-b) contain the whole of the relative structure in (19) so that a major part of their constituents is the output of a true syntactic transformation. Hence, by (2) and (3) which forbid lexical insertion after the operation of nonlexical transformations, the lexical insertion of (23a-b) and an infinite number of similarly derived nouns is prohibited.

We can make (24e) more interesting and complex by allowing one burúkú to be a constituent of the complex word and another one a qualifier of the new complex item as in (25).

(25)   fífọmọtófọ́júgúnọ̀sẹburúkú burúkú yẹn ni
          'it is that bad use of a blind child for preparing bad soap'

So far we have been considering the single application of rule (11) to VP's. Actually, application may be recursive. We may consider only the àì + VP operation now although the reduplication operation covers the same set of VP's. The /àì/ rule applies to all conceivable VP's if the condition on rule (11) is noted. Since this rule applies to practically all VP's, and some of the nouns used in such VP's might also have been derived through the àì or "RED" operation, it can apply and re-apply to structures indef-initely. So, when àì + VP applies, a repeated application of the operation to other repeated applications could lead to the complex noun subject of kò burú 'is not bad' in (26).

(26)   àìfàìmaláìmàìdáraṣàìdárasáláìmàìdára kò burú[13]

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[13]When an earlier version of this paper was presented at the 11th West African Languages Congress in Yaoundé, Cameroun (April 1974), some native

The subject noun in (26) is obtained after seven repeated applications of the /àì/ + VP operation as the underlining of àì indicates. A rough translation of the complex noun is 'not taking advantage of a failure to know one who has no conscience to misbehave to the person who has no conscience'. Within the complex noun are other nominalizations like àìdára 'not being good' or 'evil', àìmàìdára 'not recognizing evil', aláìmàìdára 'one who does not know what is not good' or 'one who does not recognize evil', etc. The important point about (26) is that its subject noun will be recognized as one lexical item, a single noun like (23a-b) in the Yoruba language. And since this /àì/ rule derives single lexical nouns from practically all VP's including those that have undergone all types of true syntactic transformations, condition (3) above will make the lexical insertion of these nouns impossible. Furthermore, we do not know the number of VP's in Yoruba, so one can say that the àì and RED(uplication) rules derive an <u>infinite</u> number of nouns; and that condition (3) makes the lexical insertion of this infinite set of lexical items impossible.

So we now find that there is a lexical insertion problem for complex noun derivations in the Yoruba language. We saw from (2) and (3) that lexical insertion must take place before any true syntactic transformation applies. For many Yoruba noun derivations, this condition poses no problems even when the VP's in (12f-i) are used as stems. However, there are VP's for which a problem exists. These are the ones which had already undergone true syntactic transformational operations. In this work, we exemplified the second class of VP's only with those into which formatives are transformationally introduced. An infinite set of other VP's are derived through the use

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speakers of Yoruba objected to the production of the subject noun of (26) on the ground that such complex items are not taught in schools, but everybody agreed that although it can be regarded as an entirely new lexical item, it is Yoruba, and it can be interpreted by any native speaker of the language. In the spoken language, one may never come across a noun involving as many as seven repeated applications of the /àì/ + VP rule like (26). But I often hear simple cases of repeated applications as in àìfàìmáṣeé 'not failing to do it'. So, (26) is just an extension of such expressions. The important point, however, is that repeated applications exist.

of elementary transformations, and they also function as stems for noun derivation when (11) applies. Since, after the application of (11), these complex derived VP's plus their prefixes become single lexical items (like (17) and (23)), they operate in the structural positions of Yoruba nouns (as in (24a-f)), and these problematic lexical items also constitute an infinite set as we have already observed, the lexical insertion of this set of nouns anywhere in the syntactic structure $\Sigma = (P_1, \ldots, P_n)$ is prohibited, and therefore indescribable, in a grammar which incorporates condition (3). This is so because, at present, lexical insertion is obligatory for all lexical items.

5. The Lexical Amalgamation Proposal

If we want a transformational grammar to handle the lexical insertion problem in Yoruba syntax without violating the main Chomskyan requirement of the standard theory already stated as (3) in section 1, we must suggest an alternative to lexical insertion for Yoruba complex nouns. The alternative suggested here is the lexical amalgamation proposal. Only two steps are necessary.

First, we have to introduce the complex noun into the categorial subcomponent of the syntactic component. Suppose we designate the complex noun as Nc in a phrase structure grammar (PSG), then Nc can be introduced by a rule which introduces N(oun) ordinarily, e.g. in addition to a common Yoruba rule like NP → N (DET) (S), we can have NP → Nc (DET) (S).[14] The two possibilities can be combined together into a single rule like (27a). Examples (27b-c) show how N and Nc are separately developed. Since Nc is now a category of the PSG, we can replace the equality sign of the word derivation rule (11b) with a rewriting arrow:

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[14]Instead of recognizing Nc as a different syntactic category from N, we may just have the rule NP → N DET S and another rule N → Nc where N is rewritten as a category symbol; but we hesitate to take that alternative because, in the standard theory, only complex symbols occur on the right of the arrow whenever N is on the left.

(27) a. NP → $\left\{ \begin{matrix} N \\ Nc \end{matrix} \right\}$ (DET) (S)

   b. N → CS (by Chomsky [1965:114])

   c. Nc → $\left\{ \begin{matrix} /ai/ \\ RED \end{matrix} \right\}$ VP (from (11a) above)

The condition under which Nc gets expanded was stated in (11) earlier. That condition need not appear with our rewriting rule since it is just the type of statement linguists always ignore.[15] Also, the further expansion of RED(uplication) in (11b) is beyond the scope of the categorial section of grammar since only phonological symbols like consonant and vowel appear on the right of the equality sign. The VP labels for the brackets are not parts of the relevant symbols since they serve merely as boundary markers for the relevant phonological symbols.

   The second step is the erasure of word boundary symbols for all formatives under any Nc category followed by their amalgamation into a single word in the transformational subcomponent when transformational rules cease to apply.[16] The only condition for the disappearance of word boundary symbols between the affected formatives and their eventual amalgamation into a single word is the ultimate dominance of all the formatives somewhere in the categorial section by the category symbol Nc. We illustrate this process with only one tree diagram. In this diagram, in order to show that lexical amalgamation is not a T-rule, we allow for several occurrences of Nc under one principal Nc category. From the step by step description of how sentence (28) is derived from (29), we see how lexical amalgamation operates.

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[15]Actually, we need not state any condition on rule (11) since nobody states such. For instance, the S in Yoruba PS rule NP → N DET S can dominate a relative but never an imperative or interrogative sentence; yet this S is not specially marked, nor is there any condition in the categorial subcomponent indicating that it is not imperative or interrogative. Similarly, VP is always written as VP in rules although the VP in (27c) excludes those prohibited by the condition on (11).

[16]Instead of using the formative boundary symbol, +, to represent word boundary in (29), we use the empty space between words for this purpose. So, since we do not use boundary symbols, the first part of the lexical amalgamation operation, which deletes boundary symbols, applies vacuously.

Let us examine sentence (28) in which the transformationally inserted
formatives, one REL item and the reflexive formative ara 'self', are
underlined. The English translation of the complex noun is also underlined.

(28)   àìfàìlógbónìórífìgòtót ifóbáláìfúnrarènísimijà ni a bú Délé fún

      <u>'not using a broken bottle to fight against one who does not give
himself any peace of mind owing to lack of wisdom</u> is what we con-
demned Dele for'

The generalized phrase marker for (28) is given as (29) and in that
diagram, category symbols are numbered to facilitate our description of
the transformational and amalgamation processes. Also, referential indices
indicate coreferential items.

The complex subject of (28), which also occurs as the configuration under
the Nc_1 category in (29), is a single Yoruba noun (or nominal) by function
since it operates in the structural positions of single nouns. The most
significant of these structural positions were illustrated in (24) above.
Example (28) occurs in all the identified positions. It is also a noun by
form since it takes a noun derivational prefix. Hence, we have followed
the example of linguists who define parts of speech as nominals, adjectivals,
adverbials and verbals by function, but nouns, adjectives, adverbs and verbs
by form. We can say that the subject of (28) is a nominal and a noun. We
may now look at tree diagram (29) in which FM is a focus marker.

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                                    S₁
                        ┌────────────┴──────────────┐
                      NP₁                          VP₁
                       │                      ┌─────┴─────┐
                      Nc₁                    FM           S₂
                 ┌─────┴────┐                │        ┌───┴────────┐
                àí         VP₂               ni    a bú Délé fún
                 ┊          │              'we condemn Dele for it'
              (NZF)         S₃
                      ┌─────┴────────┐
                     NP            VP₃
                   ┌──┴──┐    ┌─────┼──────────────┐
                 ẹni kanₖ    V₁    NP₃              S₄
                              │     │         ┌─────┴──────────┐
                              fi   Nc₂       NP₄              VP₄
                              ┌─────┴──┐   ┌──┴──┐    ┌────────┼─────────┐
                             àí       VP₅ ẹni kanₖ  V₂       NP₅          S₆
                              ┊        │            │    ┌────┴───┐   ┌────┴────┐
                           (NZF)      S₅            fi   N       S₇ NP₆        VP₆
                              ┌────────┴────┐          │    ┌────┴──┐ ┌──┴──┐ ┌──┴────┐
                            NP₇           VP₇         ìgòᵢ ìgòᵢ ti fọ́ ẹni kanₖ V₃    NP₈
                          ┌──┴──┐   ┌──────┴──────┐                        ┌─┴─┐    │
                        ẹni kanₖ (kó) ní ọgbọ́n ní orí                     bá  jà   Nc₃
                                                                          ┌────┴────┐
                                                                         oníⱼ      Nc₄
                                                                             ┌──────┴──┐
                                                                            àí        VP₈
                                                                                       │
                                                                                       S₈
                                                               ┌───────────────────────┴──┐
                                                             ẹni kanⱼ (kò) fún ẹni kanⱼ ní ìsimi
```

(NZF = nominalization formative)

For a description of how (28) is obtained from (29), we start from S_8. The coreferential items which are marked with the index j make S_8 satisfy the structure index for the reflexive (transformational) rule in (13). So the obligatory rule (13) and the optional (14) apply, giving us for S_8

(30) S_8 = ẹni kan kò fún ara rẹ̀ ní ìsimi
      'someone (does not) give himself some rest'

After an indefinite subject NP deletion rule has deleted ẹni kan 'someone' from S_8 because it is coreferential to oní$_j$ 'the person who is closely connected with (something)' or 'the owner of (something)' higher in the tree, we are left with a VP which becomes VP_8. No other T-rule can apply to the constituents of VP_8, so the lexical amalgamation of àì and all the formatives dominated by VP_8 takes place giving us a single word under Nc_4.

(31) Nc_4 = àìkòfúnrarẹ̀nísimi or àìfúnrarẹ̀nísimi
      'not giving himself some rest' [17]

The two possibilities in (31) are synonymous since kò 'not' is optional and semantically insignificant after àì in àì + VP nominalizations. The element will be omitted henceforth.

At Nc_3, we have oní + Nc_4. No transformational rule can now apply to the constituents of Nc_3, so the lexical amalgamation of oní and Nc_4 produces

(32) Nc_3 = aláìfúnrarẹ̀nísimi
      'a person who does not give himself any peace of mind'

After other syntactic operations on higher constituents, e.g. the transformational permutation of jà 'fight' from bá jà 'fight against' to the

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[17]We cannot discuss the putative subjects of nominalized VP's as that is beyond the scope of this paper. But we assume that such VP's generally have indefinite subject NP's which are deleted by an indefinite subject NP deletion rule. If we do not make this assumption, our tree diagram will be simpler and less deep since many derivational steps would be omitted through the merging of several VP's, e.g. VP and VP into one. Whichever step is taken has no effect on the lexical amalgamation proposal.

right of NP_8, we reach level S_6 where we have

(33) S_6 = ẹni kan bá aláìfúnrarẹ̀nísimi jà
'someone fought against a person who does not give himself
any peace of mind'

Later we find that NP_5 satisfies the SI of a relativization transfor-
mation, cf. tree diagram (20), and so we introduce tí (REL) transforma-
tionally between N and S_7 and pronominalize ìgò under S_7 to ó giving

(34) NP_5 = ìgò tí ó ti fọ́   'the bottle which has got broken'

Then, further up in the tree, we come to S_4 where we now have

(35) S_4 = ẹni kan fi ìgò tí ó ti fọ́ bá aláìfúnrarẹ̀nísimi jà
'someone used a broken bottle to fight against a man or person
who does not give himself any peace of mind'

After all necessary transformational operations on the constituents of
S_5 and VP_5 have ceased, we move to Nc_2 where through the lexical amalgamation
of all formatives into a single word, we have

(36) · Nc_2 = àìlógbọ́nlórí   (lit. not having wisdom in the head)
'being unwise' or 'foolishness'

After the application of other T-rules, and before final indefinite NP
deletion under S_3, we arrive at

(37) S_3 = ẹni kan fi àìlógbọ́nlórí fi ìgò tí ó ti fọ́ bá aláìfúnrarẹ̀nísimi jà
(where already amalgamated constituents of Nc's are underlined)
'someone, through lack of wisdom, used a broken bottle to fight
against the person or man who does not give himself any peace
of mind'

Then we have final indefinite NP deletion leaving us with VP_2, S_3 and
VP_3 in a direct line of derivation, and the last two mentioned categories
disappear through tree pruning giving us àì + VP_2 alone under Nc_1. Since
no other T-rule can now apply to the constituents of Nc_1, final lexical amal-
gamation takes place giving us a single word under Nc_1:

(38) Nc_1 = àìfàìlógbọ́nlórífìgòtótìfọ́báláìfúnrarẹ̀nísimijà

This is the subject noun of (28) and (29).

Several steps are omitted, e.g. the assimilation of tí ó (REL he/it)

to tó , fi ìgò to fìgò 'use bottle', fún ara 'for self' to fúnra ,
etc., but this must be expected since phonological rules like assimilation
ought not to take place in the transformational subcomponent. Actually,
a step by step statement of how (28) is derived from (29) in all components
of grammar does not really increase one's awareness or appreciation of lex-
ical amalgamation.

From the preceding description we see how lexical amalgamation operates
in practice. It is not ordered among the T-rules of grammar since it oper-
ates only on constituents to which no other T-rule ever applies. The product
of a lexical amalgamation operation, e.g. (32) = Nc_3 or (36) = Nc_2, is a
single noun having "syntactic features" of nouns like [+N, -Count, +Abstract
...], but it is not inserted like simple nouns through the lexical transfor-
mation rule (2). If we had not proposed an alternative to lexical insertion
for Yoruba complex nouns, we would have been forced to recognize at least
four lexical insertion stages for Yoruba in order to describe sentence (28),
viz. the one at deep structure giving us the terminals in tree diagram (29),
the second one at both Nc_4 and Nc_2, the third at Nc_3, and finally at Nc_1.
We, however, leave a consideration of the advantages of lexical amalgamation
over lexical insertion for complex nouns to the next section.

6. Conclusions

In order to falsify the Chomskyan assertion that "for $j \geq i$ [in Σ =
$(P_1, \ldots, P_n)$], the transformation used to form P_{j+1} from P_j is nonlexical,"
generative semanticists have developed various styles of arguments. We have
arguments on the synonymous relationship and identical distributional
characteristics of differently categorized syntactic constructions like
Lakoff's arguments on instrumental adverbs (cf. Lakoff [1968]). There are
arguments on the relevance of presuppositions to semantic interpretation and
the need to reflect such (linguistic and nonlinguistic) antecedents in
encoding and subsequents in decoding in abstract deep structures. But the
most relevant types of arguments for us have been those on lexical decompo-
sition.

Lexical decomposition is a very fruitful area of linguistic research.
Its main preoccupation is with the discovery of phrasal paraphrases which
are "totally synonymous" with some lexical items while postulating these

phrasal paraphrases as underlying forms of their "surface" single item synonyms. "Total synonymy", in the sense of John Lyons, is proved through their "interchangeability in all contexts" [Lyons 1968:448]. McCawley [1968] tried to establish such relationships between 'kill' and 'cause to become not alive' while Postal [1970] provided a similar analysis for 'remind' and 'perceive to be similar'. If 'kill' is derived from 'cause to become not alive' or 'die' from 'become not alive', etc., then there must be more than one lexical insertion stage in grammar. At least, we should have one for the atomic elements used in the phrasal paraphrases and another one for the insertion of derived "surface" lexical items. The concept of deep structure, established as the only place where the lexical insertion operation of the standard theory takes place, must therefore be abandoned.

Lexical decomposition has three problems. First, if one derives (surface) 'remind' from (underlying) 'perceive to be similar', or 'die' from 'become not alive', nothing stops one from labelling all lexical words as "surface lexical items" and deriving 'spinster' from 'woman who is not married', 'widow' from 'already married woman whose husband is no longer alive', 'giants' from 'people who are too tall', 'dwarf' from 'an adult human being who is incredibly short', 'look' from 'direct the eyes', 'elude' from 'avoid compliance with', 'mock' from 'tantalize with illusion', etc. for all lexical items. The lexical items used in the decomposition of the above (e.g. 'marry') will be similarly decomposed, and all these operations must take place in the process of a single syntactic description. While this practice will give many industrious linguists the opportunity to conduct intensive research and write many thought-provoking papers on myriads of putative surface lexical items, such linguists will only be justifying, syntactically, the practice of traditional lexicographers who use the "underlying" phrasal paraphrases as the meanings of "surface" lexical entries. But this would not have proved that the concept of underlying and surface lexical items has any linguistic or psychological reality.

Secondly, interchangeability in all contexts for underlying and "surface" lexical items is very difficult to establish although this is the crux of all the syntactic arguments used. Otherwise, Fodor would not have found

three reasons for not deriving 'kill' from 'cause to die'. Like Fodor
[1970], Chomsky too noticed a similar inadequacy of arguments on instrumen-
tal adverbs [Chomsky 1971:194-5]. He also commented on Postal's discus-
sion of 'remind' and observed that the regularity of some 'remind' sentences
he discussed "is a regularity statable precisely at the level of deep
structure" [Chomsky 1972:154]. If only one context exists where inter-
changeability is not proved, total synonymy has failed and the use of one
form as the underlying version of the other is no longer justifiable.

Thirdly, some arbitrariness in the determination of which semantic "atoms"
must be used in the underlying representation of surface forms is inevitable.
Given the two derivations: 'dead' from 'be not alive' and 'alive' from 'be
not dead', one has to argue one derivation out of acceptance although both
forms are correct. And this type of decision must be taken for all known
lexical items. While it will give linguists plenty of materials to work on,
it does not directly or positively broaden linguistic knowledge.

All considered, it seems that the use of lexical decomposition plus
derivational constraints and their attendant multiple lexical insertion
solution in infinitely deep abstract underlying structures just to falsify
condition (3) on syntactic deep structure is like using a fully loaded
machine gun to kill a troublesome housefly. In a grammar where lexical in-
sertion is mandatory for all lexical items, all we need to falsify condition
(3) is the existence in any human language of complex single item words con-
taining formatives not derivable anywhere in grammar without a prior applica-
tion of the true syntactic transformations of the standard theory. Once
such words, e.g. ìmotaraeninìkan 'selfishness', are obtained, we do not
need innumerable syntactic arguments to prove the interchangeability of some
forms in all contexts before concluding that a lexical insertion problem
exists. If lexical insertion were to remain mandatory for all lexical items,
then we would have clearly falsified condition (3) on deep structure through
any of the examples of complex nouns in section 4. Our proposal in section 5
is for an alternative to lexical insertion for such complex nouns through
lexical amalgamation, and only such alternatives can save or validate condi-
tion (3) which is the condition that lexical items are inserted only once in
the syntactic deep structure.

One may be expected to examine the discussion here in relation to Chomsky's proposal on nominalizations. Since the complex nouns for which rule (11) is established are either positive or negative gerundive (although the negative is also abstract), they fit into the class of nominalizations for which Chomsky suggested a transformational derivation in his lexicalist paper [Chomsky 1970]. However, Chomsky's gerundive nominals are derived from verbs whereas ours are derived from verb phrases. That is the main cause of difference. Since verb phrases can be complex internally, single word nouns derived from such transformationally derived complex VP's must be complex. Our argument rests on the internal complexity of VP's used as stems for noun derivation, so any similarity between our observations and Chomsky's on gerundive nominals is merely accidental.

Then, with the proposal of an alternative to lexical insertion, we have been able to suggest some answers to certain problematic questions. One deals with the problem of new derived lexical items not recorded by lexicographers in dictionaries. Yoruba authors, translators and news writers coin or create new words everyday,[18] and these are understood by other Yoruba speakers just as speakers of languages create new sentences which are understood by others. How can such novel items be inserted in deep structure when

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[18]Some Yoruba examples in 1975 are given here: agbomiró (a + VP = [gba omi ró]) for 'water pipe' constructed by the present writer while translating a Christian Science lecture on the power of prayers by Albert B. Crichlow. (See A.B. Crichlow, 1973 1975, "Agbára Adúrà," Christian Science Board of Directors, Boston, Mass., p. 1.) On June 4, 1975, we had àjo káfowówowókòléèwò omo Nigeria àti Britain as a Yoruba translation of 'the Nigeria-Britain Friendship Association' from W.N.T.V./W.N.B.S. news broadcast at 7:30 p.m. The neologism káfowówowókòléèwò can be translated literally with the sentence 'it is not wrong for people to mix together'. Then, on Monday, 3rd November, 1975, from the same television network during a similar broadcast at 7:30 p.m., we had bí orin şe jé apàbànújérun with a repeated application of prefix plus VP, viz. a + VP = [pa ì + VP = [ba inú jé] run], where the new word apàbànújérun is translatable as 'something which destroys sorrow'. If lexical insertion in deep structure is not supplemented with lexical amalgamation elsewhere, then lexicographers must anticipate all new syntactically derived nouns and record them in dictionaries for lexical insertion purposes in the standard and basic theories. No such dictionary can be constructed.

the lexical subcomponent of the base makes use of only items found in dictionaries? This is not a problem for the standard theory alone since all the surface and underlying lexical items of the basic theory, e.g. 'remind' and 'perceive to be similar', are recorded in dictionaries. However, an infinite number of nouns can be constructed from Yoruba VP's and it is obvious that no dictionary can record this infinite set. Hence, a process like lexical amalgamation is needed in transformational grammar (whether standard or basic) to account for this infinite set of lexical items which dictionaries cannot handle.

Another problem with which transformational grammarians are beset deals with delimiting the boundaries of any grammatical description. Chomsky's metatheoretic arguments for condition (3) rest simply on this. If lexical amalgamation as suggested here were incorporated into grammar, it would then be possible to validate Chomsky's statement that "no linguistically significant generalizations are lost if all the transformations of L (i.e. lexical transformations) are applied before any transformations of non-L (i.e. non-lexical transformations) in forming derivations. This proposal constitutes a potential step forward in that it restricts the class of grammars" [Chomsky 1972:128]. We do not know how "the class of grammars" is restricted. However, since lexical amalgamation is not lexical insertion, Chomsky's statement here as well as condition (3) now stand. But their validity depends solely on the incorporation of lexical amalgamation into transformational subcomponent of grammar.

It then appears that generative semanticists, who seem to constitute the majority in the transformational school, find the lexical insertion requirement of a standard theory inconvenient, and consequently, find the standard theory itself intolerable, mainly because they prefer the abrogation of the syntactic deep structure to the provision of alternatives to lexical insertion for problematic lexical items.

Finally, although this paper has not actually demonstrated one way or the other whether deep structure exists (thereby not falling within what Bedell [1974] described as "the arguments about deep structure"), it has taken one step towards the Chomskyan requirement on restricting the class of grammars by not throwing out the concept of deep structure after the

establishment of our Yoruba lexical insertion problem. What is not known
is whether all transformational grammarians will think it worthwhile to
take Chomsky's "potential step forward" which "restricts the class of
grammars." And so, it appears that our most crucial question now is: "How
abstract can syntax be in a limited or restricted class of grammars?"

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TONE IN KIKAMBA AND THE CENTRAL KENYA BANTU LANGUAGES

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The forms and functions of pitch variation in Kĩkamba are
examined, together with the similarities and differences
noted in ten closely-related Bantu dialects. Two phonetic
systems of tone are described involving two basic tone
levels, which are expandable either by a process of down-
step or by the formation of an extra-high (and optionally an
extra-low) tone. In all the dialects, tone is both lexically
distinctive and serves to reinforce particular aspects of
syntax, details of which are presented. Some comparative
evidence is cited, and the relationship between the two pho-
netic systems is considered.

1. Introduction

Kĩkamba is a Bantu language of Kenya, spoken by over 1 million people
over a wide area east of Nairobi as far as, in places, the Coast. The
following description is based primarily on the speech of Mr. Michael
Mũlwa of Mbiũnĩ Sub-location, Mbũmbũnĩ Location, Machakos District.
Material was also checked with Mr. Boniface Kĩthitũ of Kĩtui. While par-
ticular attention will be paid to what is ultimately one idiolect of
Kĩkamba, reference will be made to general tonal features of the group of
languages/dialects including Kĩkũyũ, Kĩkamba, Embu, Mbeere, Cuka, Mũthambĩ,
Mĩĩtĩne, Mwĩmbĩ, Imenti, Tharaka and Tigania. All are mutually-intelligible
to a high degree, except for Kĩkamba, where the loss of two consonants
proves to be a more noticeable barrier to close mutual-intelligibility with
the other dialects.[1]

Among the group of languages, lexical, syntactic and segmental
phonological differences are few, though distinctive. The surface facts
of tone are perhaps among the sharpest distinguishing characteristics,
but even here, as will be shown, the similarities of basic form and func-
tion are great; we can thus see more clearly the peripheral differences.
It may be that what we will suggest as general tonal features of this
group of languages may prove to be significant characteristics of other
groups of Bantu languages.

Kĩkamba has seven distinctive vowel qualities, which may be long or
short, again distinctively: [i e ɛ a ɔ o u] and [i: e: ɛ: a: ɔ: o: u:].
Two like vowels occurring together represent distinct syllables bearing
distinct tones, which contract to a single quality though of double
length. A maximum of three consecutive like vowels has been found to
date; these contract to form a triple length vowel. As pointed out by
Whiteley and Mũli [1962], therefore, four degrees of vowel length may be
distinguished phonetically:

(1)   túva   [túva] 'pay wages'   nééna   [né::na]   'speak'
        tú:va   [tú:va] 'get blunt'   syóóóka [syó:::ka] 'slip, slide'

Combinations of unlike tones on any sequence of consecutive vowels auto-
matically form gliding tones:

(2)   eiǎ [⌣́] 'weed'   eîǎ [⌢̀] 'milk'   eià [—̀] 'lake, pond'

Such sequences of up to eight consecutive vowels (see Whiteley and Mūli [1962]) often arise from historical consonant-loss; e.g. eio 'banana' (cf. Kĩkũyũ [iriɣo]) but kalilo 'small banana'.   Consonant-loss

is important in accounting for the contemporary situation where all vowels belong non-predictably to one of two series: mutable and immutable. Immutable vowels can be shown on comparative evidence to have derived historically from CV syllables by initial-consonant loss. The immutable vowels block particular processes of vowel contraction. Compare, for example, the following:

(3)   kwɛ̂:ndà 'to love, like'   /ko+ɛ:nda/ (mutable [ɛ])
      koɛ̂:ndà 'to go'   /ko+ɛ:nda/ (immutable [ɛ])

2.   The Tones of Nouns

Although it will be shown eventually that all phonological words of any category are structured tonally on the same patterns and alter their tone patterns according to the same general principles, we shall begin with a description of nouns since they exhibit the most complete set of distinct basic forms and conditioned varieties. The language makes use of four distinct phonetic tone levels, though the analysis will indicate how they represent what might be viewed as an underlying and probably historical two-tone distinction. The expanded phonetic tonal register of extra-high, high, low, and extra-low tones is employed before particular syntactic boundaries, the details of which will be exemplified in subsequent sections.

2.1. Phonetic tonal forms. The following examples presuppose a classification based on two factors: the quality of final tone(s), and the patterning of tone-changes that itself implies a non-predictable sub-typing (marked A and B). The columns 1-4 represent the different forms of nouns that are found in different syntactic environments, some notes on which follow the examples.

(4)

1	2	3	4	
a.	**-LL#(A)**			
ŋgɔ	ŋgɔɔ̀	ŋgɔɔ̀	ŋgɔɔ̀	'leopard'
nzaa	nzaà	nzaà	nzaà	'hunger'
kelɔmɔ	kelɔmɔ̀	kelɔmɔ̀	kelɔmɔ̀	'lip'
nzɔlasɔlanyɔ	nzɔlasɔlanyɔ̀	nzɔlasɔlanyɔ̀	nzɔlasɔlanyɔ̀	'zigzag path'
b.	**-L:L#(A)**			
mo:ndo	mo͡:ndò	mo͡:ndò	mo͡:ndò	'person'
mokɔ:vi	mokɔ͡:vì	mokɔ͡:vì	mokɔ͡:vì	'borrower'
movolo:nze	movolo͡:nzè	movolo͡:nzè	movolo͡:nzè	'confuser'
c.	**-LL#(B)**			
ŋgaa	ŋgaa	ŋgaà	ŋgaà	'burnt sugar-cane'
eio	eio	eiò	eiò	'banana'
moinaa	moinaa	moinaà	moinaà	'younger sibling'
d.	**-L:L#(B)**			
mbɛ:vɛ	mbɛ:vɛ	mbɛ͡:vɛ̀	mbɛ͡:vɛ̀	'accordion'
ketu:lya	ketu:lya	ketu͡:lyà	ketu͡:lyà	'forehead'
mosika:le	mosika;le	mosika͡:lè	mosika͡:lè	'soldier'
e.	**-HL#(A)**			
nzáa	nzáa͡	nzáa͡	nzáa͡	'finger'
etáu	etáu͡	etáu͡	etáu͡	'cheek'
mokô:ŋgóla	mokô:ŋgóla͡	mokô:ŋgóla͡	mokô:ŋgóla͡	[type of tree]
f.	**-H:L#(A)**			
ndɔ̂:tɔ	ndɔ̂:tɔ̀	ndɔ̂:tɔ̀	ndɔ̂:tɔ̀	'dream'
kei:ŋgi	kei͡:ŋgì	kei͡:ŋgì	kei͡:ŋgì	'drum-stick'
mosaví:vo	mosaví:vò	mosaví:vò	mosaví:vò	[type of vine]
g.	**-HL#(B)**			
kekóno	kekóno	kekóno͡	kekóno͡	'mushroom'
moðinéa	moðinéa	moðinéa͡	moðinéa͡	[type of bush]
h.	**-H:L#(B)**			
katɛ̂:na	katɛ̂:na	katɛ̂:nà	katɛ̂:nà	'kid'
mo:nzáó:ne	mo:nzáó:ne	mo:nzáó:nè	mo:nzáó:nè	'member of the Anzaũnĩ clan

(4) cont.

i. -H#(A)

nzá	nzáˣ	nzáˣ	nzǎˣ	'outside'
motwέ	motwέˣ	motwέˣ	motwέˣ	'head'
katú:ndú	katú:ndúˣ	katú:ndûˣ	katú:ndúˣ	[female name]

j. -H#(B)

ŋgá	ŋgá	ŋgáˣ	ŋgâ	[type of tendon]
moká	moká	mokáˣ	mokâ	'wife, woman'
katú:ndú	katú:ndú	katú:ndǔˣ	katú:ndû	'small gathering'

A summary of the syntactic environments represented by columns 1-4 is as follows (it must be noted that the choice of tonal forms 1-4 is not conditioned by any phonetic characteristics of the surrounding context):

Column 1: tones of nouns when qualified within the noun-phrase (i.e. by an adjective, numeral or associative marker in a possessive construction);

Column 2: tones used in all places in declarative statements (including subject), except in the place immediately following a positive verb; these forms are used in all places in imperative sentences; section 5 will generalise their function in coordinate and subordinate sentences;

Column 3: tones used immediately following a positive declarative verb when another item follows in the same sentence;

Column 4: tones used immediately following a positive declarative verb sentence-finally.

2.2. Underlying tonal forms. It is not possible to predict the membership of sub-classes of A and B which must be recognized as underlyingly different. We may take as basic either the form 2 (thus recognising four underlying levels of tone), or the forms 1 (ignoring gliding tones which are largely predictable--see section 2.3), so that we recognise just two underlying levels and a diacritic classification feature corresponding to A/B. The majority of items belong to sub-class A. We will thus require the following rules of tonal register expansion, given the feature specifications:

$$[\overset{x}{}] \quad [\acute{}] \quad [\bar{}] \quad [\grave{}]$$

	$[\overset{x}{}]$	$[\acute{}]$	$[\bar{}]$	$[\grave{}]$
high	+	+	−	−
extreme	+	−	−	+

(R1) $[+\text{syllabic}] \rightarrow [+\text{extreme}] \ / \ \underline{} \ ([-\text{high}]) +$

(where + for Class A includes the boundaries 2, 3, and 4 above; and for Class B the boundaries 3 and 4)

A special rule will account for the final tone of −H#B items in environment 4:

(R2) $[+\text{high}] \rightarrow \begin{bmatrix} +\text{high} & -\text{high} \\ & +\text{extr} \end{bmatrix} \ / \ V \ \underline{}]_B \ \#$

The final derived forms of −HL# itmes will be predicted in part by the processes of gliding-tone formation expressed below, and in part by the following assimilation rule:

(R3) $\begin{bmatrix} -\text{high} \\ +\text{extr} \end{bmatrix} \rightarrow \begin{bmatrix} +\text{high} & -\text{high} \\ +\text{extr} & +\text{extr} \end{bmatrix} \ / \ \begin{bmatrix} +\text{high} \\ +\text{extr} \end{bmatrix} \ \underline{}$

2.3. <u>Gliding tones</u>. Only falling glides are possible on single vowels (rising tones being a combination of a low + high on successive syllables where the two syllabic nuclei are adjacent); and these falling tones are invariably associated with long vowels, with the exception of the [^] and [$\overset{x}{}$] tones which are accounted for by R2 and R3 above. The gliding tones that are related to long vowels are predictable as follows: two kinds of long vowels must be distinguished, the inherent long vowel, and that lengthened by position (before a prenasalised consonant) or by a process of glide-formation or vowel-contraction:

   i) Long low-toned vowels always glide penultimately (whether inherently long or lengthened by position) if a low tone [`] follows:

(5)   kwê:ndà   'to love'   /ɛnda/   'love'

       koê:ndà   'to go'   /ɛ:nda/   'go'

       kwô:nzà   'to grow thin, ill'   /ɔnza/   'grow thin, ill'

       (the forms in slants are intended to suggest more abstract representations; in fact, all utterance-initial and utterance-final vowels in Kĩkamba must be short.)

ii) Long high-toned glide penultimately only if inherently long and followed by a low tone:

(6) konê͡:ŋgà   'to give'   /nɛ́:ŋga/ 'give'
     kwê͡:kà   'to do'   /é:ka/   'do'
     kwá͡:ká͡   'to build'   /áka/   'build'

iii) Long low-toned vowels cannot occur pre-penultimately and be followed by a lower tone; glide-tone-formation is thus blocked.

iv) Long high-toned vowels glide pre-penultimately only if inherently long and followed by a low tone:

(7) koɔ͡:ŋgɔla (ndeá͡)   'to succeed in   /ɔ́:ŋgɔ́la/
                          throwing sticks through
                          a rolling hoop'
     kwɔ́:ŋgɔɛà   'to fill with water'   /ɔ́ŋgɔ́ɛa/

While these generalisations emerge, it must be noted that there exists a small number of counter-examples, whose gliding tones are not predictable on this basis. Some of these have falling glides on long vowels but before a following high tone: e.g. mbaâ:á͡ 'flying ants'. Among the forms that cannot be generalised are many of the verb forms, where gliding-tone formation is suppressed in specific grammatical environments:

(8) kwá:ta   'touch!'   [imperative singular]
     nénâ:kwâ:tâ   'I have touched'   [recent perfect]
     né:ŋgwá:tiê   'I touched'   [recent simple past]

2.4. General features of noun tones. Certain details of Kĩkamba noun tones are generalisable for the whole group of dialects.

i) The distinction of three tonal classes of words (-H#; -HL#; -LL#), based on the quality of final tones, is maintained by all the dialects. Neutralisations of the sub-classification A/B have taken place as follows:

(9) a. Tigania:
        5 classes: -H#; -HL#A,B; -LL#A,B

    b. Mĩĩtĩne and one dialect of Imenti (Mũthuri Kyugũ):
        4 classes: -H#; -HL#A,B; -LL#

    c. Tharaka and one dialect of Imenti (Annah Kĩambati):
        3 classes: -H#; -HL#; -LL#

ii) Four syntactic environments have been enumerated above to account for the maximal differences of tonal form in Kĩkamba nouns. We note that there are never four different tonal forms for any one noun, but that over-all the distinctions are worth making. The other dialects make the follow-ing, related distinctions, using tone to reinforce syntactic structure:

(10) Kĩkũyũ and Embu

    a. tones before item within the same noun-phrase (adjective, cardinal numeral, associative marker)

    b. tones of item not immediately following a positive declarative verb and not sentence-finally

    c. as (10b), but sentence-finally

    d. tones of item immediately following a positive declarative verb, but not sentence-finally

    e. as (10d), but sentence-finally

(11) Mbeere

    a. tones before item within the same noun-phrase

    b. tones of subject

    c. tones of item in any other non-sentence-final position, not im-mediately following a positive declarative verb

    d. tones used finally except after a positive declarative verb

    e. tones used for item immediately following a positive declarative verb, but not sentence-finally

    f. as (11e), but sentence-finally

(12) Cuka

    a. tones before item within the same noun-phrase, except a cardinal numeral qualifier

    b. tones before a cardinal numeral

    c. tones of item not immediately following a positive declarative verb and not sentence-finally

    d. as (12c), but sentence-finally

    e. tones of item immediately following a positive declarative verb, but not sentence-finally

    f. as (12e), but sentence-finally

(13) Mwĩmbĩ

    a. tones before item within the same noun-phrase

    b. tones used non-finally in any sentence

    c.   tones used finally in a positive sentence

    d.   tones used finally in a negative sentence

(14) Mũthambĩ

    a.   tones used before item within the same noun-phrase

    b.   tones used non-finally in a negative sentence

    c.   tones used finally in a negative sentence

    d.   tones used non-finally in a positive sentence

    e.   tones used finally in a positive sentence

(15) Imenti, Tharaka, Tigania and Mĩĩtĩne

    a.   tones used before item within the same noun-phrase

    b.   tones used non-finally in any sentence

    c.   tones used finally in any sentence

(We note that in Tigania forms (15c) are used additionally before a cardinal numeral qualifier within a noun-phrase.)

    iii) Only Kĩkũyũ, Embu and Mũthambĩ display the flattening process, whereby the final -H#B tones are lowered sentence-finally when not immediately following a positive declarative verb (examples in Ford [1975b]). Kĩkũyũ differs from the other dialects in one significant respect: whereas the others mark tonal distinctions before boundaries either by expanding the tonal register to four levels or not, Kĩkũyũ marks the same distinctions either by introducing a downstep feature (of both high and low tones) to alternate with certain processes of tone-change (to be described) across the boundary, or not. The following examples illustrate some aspects of this; summaries of the relevant syntactic boundaries are given in section 3.5 ii below.

(16) K̄ikũyũ[2]   nyáhoríré mwá:neki 'kiɲa ákéɣéða   βíríβírí

he beat   Mwanĩki   until   he gathered the chillies

Cuka   ndétérễ:rễˣ   ŋkiɲẫˣ   áráða   kéɲáɲî

I waited   until   he shot the crocodile

Mũthambĩ   ndaré:téré:rễˣ   mbakã̂ˣ   áráða   keɲá:ɲí

I waited   until   he shot the crocodile

Imenti   mbɛtɛrễ:rɛˣ   mwaŋkã̂ˣ   áráða   keɲá:ɲí

I waited   until   he shot the crocodile

Tigania   ndarétér̯rérễˣ   mwaŋkã̂ˣ   áráða   keɲá:ɲí

I waited   until   he shot the crocodile

Tharaka   índaré:térễˣ:re   mwaŋkã̂ˣ   árẫ:ðá   keɲá:ɲí

I waited   until   he shot the crocodile

As indicated earlier, the system of tone in K̄ikũyũ differs from that
of the other dialects in its manifestations. Whereas the other dialects
alternate two and four levels of tone, K̄ikũyũ distinguishes two levels
together with a process of downstep, which effectively increases the num-
ber of actual levels indefinitely. Since downstep is syntactically con-
ditioned, the number of phonetic levels in any sentence depends on the
number and type of constituents.

iv) K̄ikũyũ possesses processes of high-tone spreading. Only one
other dialect, Cuka, has a comparable process. We note that K̄ikũyũ, with
almost two million speakers, is by far the largest of the group of dialects.
The K̄ikũyũ-speaking region includes the capital, Nairobi; and this language
is used both for educational purposes and more widely as the language of
religion in surrounding dialect areas (though not in Ũkambanĩ). K̄ikũyũ
consequently has more prestige, and it is not unlikely that other dialects
might have assimilated in the past (and will probably assimilate in the

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[2]The downstep before kiɲa between the main and subordinate clauses
contrasts with the utilisation by the other dialects of an extra-high tone.
The citation forms of the relevant verbal words are:

Cuka: ndétéré:rề   Imenti: mbɛtéré:rɛ

Mũthambĩ: ndarétéré:rê̂   Tigania: ndarétɛɾr̯ɛrề

Tharaka: índaré:téré:rɛ

future) aspects of Kĩkũyũ speech. Generally in Kĩkũyũ, where a down-
step does not intervene across a constituent boundary, a high tone
preceding the boundary will spread to a following low tone (called
simple tone-spreading):

(17) maða:kɔ   'games'
      né máða:kɔ   '(they're) games'   /né/ [topicaliser]
  but na maða:kɔ 'and games'   /na/ [connective]

Where the same tonal sequences occur across a boundary marked by a down-
step, a related process of high-tone spreading takes place. Features
of this process are that the high tone spreads to any number of con-
secutive low tones, and that the downstep moves across the same
spread of tones (a fuller analysis of the system of tone in Kĩkũyũ,
on which this summary is based, is provided in Clements and Ford [in
preparation]):

(18) /ndinárɔ́rá mwayáhiɲá/ 'I didn't watch weakling'
        ndinárɔ́rá ˈmwayáhiɲà DS to mark the constituent boundary
      [ndinárɔ́rá mwáŷahiɲá] Tone-spreading with DS-movement

Compare the following examples of the processes, given the underlying
form /moyɛranyá/. This item belongs to the class of words whose final
high tone(s) is subject to flattening in certain environments, including
the citation form:

(19) moyɛranya   'examiner'
      né móyɛranyá   '(he's) examiner'
      ndinárɔ́rá móyɛ́rán̂yá 'I didn't watch examiner'

Investigation of these processes reveals that in positive statements
the item immediately following the verb (or the last constituent
of a noun-phrase in this position) will be marked so that words
of the flattening class will incorporate a downstep at the boundary.
In negative statements and non-statements, or if any other position
is involved (such as preceding the verb or not following immediately

after the verb), then no downstep is present, though simple tone-spreading
may be triggered. In the following examples, the connective /na/ can
be seen to have clitic status:

(20)   /ndɔ:nirɛ́ moɣɛranyá   na ɲjoɣóná/   'I saw examiner and Njũgũna'
       ndɔ:nirɛ́ moɣɛranyá ˈna ɲjoɣóná   DS to mark the boundary
       ndɔ:nirɛ́ móɣɛranyá ˈna ɲjoɣóná   Simple tone-spreading
       ɛndɔ:nirɛ́ móɣɛranyá ná ɲjóɣ̣óná⌋   Spreading with DS-movement

Kĩkũyũ also employs a process of tonal dissimilation, whereby final un-
stable high tones (a non-predictable sub-class — see Ford:1975b) become
low before a high tone following across a constituent boundary. The
following high tone may have been so formed by one of the processes of
high-tone spreading. The dissimilation process is not operative where a
downstep is present across the boundary, though it regularly occurs if
the downstep has been moved. Certain restrictions on the simple spreading
process, which relate to the initial sequence of tones and the coalescence
either of a CV noun prefix with vowel-initial roots, or of an N- prefix
with both consonant- and vowel-initial roots, and which are documented in
Ford:1975b, are presupposed. The following examples illustrate the dis-
similation process:

(21)   /né ahɛirɛ́ ɲjoɣóná onɛnɛ́/   'he gave Njũgũna greatness'
       né ahɛirɛ́ ɲjoɣóná ˈonɛnɛ́   DS to mark the boundary
       né áhɛirɛ́ ɲjoɣóná ˈonɛnɛ́   Simple tone-spreading
       né áhɛirɛ́ ɲjoɣóná ónɛ́nɛ́   Spreading with DS-movement
       ɛné áhɛirɛ́ ɲjoɣóna ónɛ́nɛ́⌋   Unstable tone dissimilation

(22)   /né aheirɛ́ ɲjoɣóná ɲjátá/   'he gave Njũgũna star'
       né ahɛirɛ́ ɲjoɣóná ˈɲjátá   DS to mark the boundary
       ɛné áhɛirɛ́ ɲjoɣóná ˈɲjátá⌋   Simple tone-spreading

   v) Kĩkũyũ is unique among the dialects under consideration in another
respect, in that a form of 'tone-shift' has taken place historically.
Some correspondences will indicate their scope in reversing certain high

+ low sequences to low + high. It is pertinent to recall that the tone
system of Kĩkũyũ now holds the low + high sequence to be marked when it
occurs word-initially, as the constraints on single-raising, referred to
above, indicate:

(23)

	Kĩkũyũ	Kĩkamba	Tharaka	Cuka
'oil, fat'	mayutá	maũtã	mayúta	mayútà
'well'	yeðimá	keðĩmã	keðíma	keðímà
'one'	emwɛ́	emwɛ̃	emwɛ́	emwɛ̂
'nine'	kɛ:ndá	kɛ:ndã	kɛ:ndá	kɛ:ndâ
'ten'	ikomí	ekõmĩ	ekómi	ekómì
'large (adj.)'	-nɛné	-nɛnɛ̃	-nɛ́nɛ	-nɛ́nɛ̀
'buy! [imper.]'	yorã	oã	yorá	yorâ
'to draw (water)'	yotahá	kotãvã	yotáa	yotáβà
'to milk'	yokamá	kokãmã	yokáma	yokámà

The points of difference noted above are clearly significant at the
phonetic level. A close examination of the fundamental functions of tone
in the language, together with a knowledge of the particular conditioning
factors, reveals that the tone system of Kĩkũyũ is at a deeper level very
similar to that more obviously shared by the other dialects. Subsequent
sections will point to additional uses of tone that support this conclusion.

vi) An important segmental distinguishing characteristic of Kĩkamba
has already been hinted at — the loss of the consonants [r] and [ɣ]. The
following comparative data will reinforce this suggestion:

(24)

	Kĩkũyũ	Kĩkamba
'cook!'	rúya	úa
'go sour!'	yayáta	kaáta
'grunt!'	yoróma	kɔɔ́ma
'fence round!'	iríya	íía
'grumble!'	nɛyɛ́na	nɛ́ɛ́na
'hill'	kerema	keemà

These facts are discussed in detail in Ford [1975a]; reference may also
be made to Whiteley and Mũli [1962] and Farnsworth [1957].

3. The Tones of Verbs

3.1. Basic forms. Kĩkamba distinguishes verbs with basic low or high tones; additionally, roots with initial long vowels of both types regularly bear distinctive tone patterns. They are exemplified in their positive imperative singular forms and their infinitive nominalisations (prefix ko-).

(25)

a. <u>High-toned root</u>

Short initial vowel:

Imperative	Infinitive	
yâ	koyá̽	'eat'
óma	koómá̽	'bite'
ómá:ŋga	koómá̄:ŋgà	'continue biting'

Long initial vowel:

íŋga	koî̽:ŋgà	'cross'
íŋgá:ŋga	koî̽:ŋgà̄:ŋgà	'continue crossing'

[Note that there is a vowel-shortening process, by which any initial or final vowel must be short; length is therefore covert in the above imperative forms.]

b. <u>Low-toned root</u>

Short initial vowel:

tilâ	kotilà	'cut off'
niní:ŋga	koniní̄:ŋgà	'carry (something heavy)'
tinééa	kotineeà	'begin (to do something)'

Long initial vowel:

kó:mba	kokó̄:mbà	'grab'
té:ndéma	kote:ndemà	'kill many animals at once; cut many trees, etc.'
tó:mbátó:mba	kotó:mbató̄:mbà	'sway up and down'

3.2. Variations in verb forms. Declarative verb forms differ tonally in certain cases when sentence-final and when non-final. Both positive and negative forms show the same alternations, except when the utterance-final, intonationally marked [^] reflex of a -H# B word is involved. When it is realised that this tone has two non-final forms, [´] and [^{X}], which represent, respectively, a positive declarative and either negative declarative

or non-declarative environment, we can see clearly the relationship be-
tween the tones of verbal words and the tones of nouns as described in
section 1. The variations in verb tones may be tabulated as follows:

(26)

	1	2	3
-LL#A, B	[⁻ ⁻]	[⁻ ⁻]	[⁻ ˋ]
-HL#A, B	[ˊ ⁻]	[ˊ ⁻]	[ˣ ˣ]
-H#A	[ˊ]	[ˊ]	[ˊ]
-H#B	[ˊ]	[ˣ]	[ˆ]
-L:L#A, B	[⁻ ⁻]	[⁻ ⁻]	[ˋ ˋ]
-H:L#A, B	[ˆ ⁻]	[ˆ ⁻]	[ˣ ˋ]

where the environments are:

1. positive non-final
2. negative non-final, and any non-declarative (imperative and subordinate) form
3. any final

Some examples of the alternations are given below:

(27)   Present habitual

né ŋgámaâ	'I milk'	né:ŋgámaá ŋɔ̄:mbɛ̀	'I milk cows'
ndíkámáâ	'I don't milk'	ndíkámáá̃ ŋɔ̄:mbɛ̀	'I don't milk cows'

Past habitual

ndyã̌:kámáá	'I didn't used to milk'
ndyã̌:kámáá ŋɔ̄:mbɛ̀	'I didn't used to milk cows'

Today past

ndĩnakãmã	'I didn't milk'
ndĩnakáma ŋɔ̄:mbɛ̀	'I didn't milk the cows'

Past perfect

nénénã̂:kámẽ̄:tɛ̀	'I had milked'
nénénã̂:káme:tɛ ŋɔ̄:mbɛ̀	'I had milked the cows'

If we extend the data to include complex and compound sentences, we
find examples of verb forms which are strictly analogous to the four forms
established for nouns. Thus, before certain internal clause/sentence
boundaries, the verb tone may be characterised as follows:

(28)

    a.   Forms 1   verb + kaná (complementizer)

                            verb + nǒ:ndǒ 'because'

                            verb + ɔnavála 'although'

                            verb + verb with ke- "simultaneous" prefix

                            verb + subordinate tense expressing 'before'

    b.   Forms 2/3 verb in relative sentence + rest of main clause

                            verb + na 'and', endě 'but'

                            verb + consecutive verb tense

                            verb + purpose clause

                            conditional verb plus main clause

The choice of forms 2 and 3 is conditioned by the form of the verb — forms 3 for negative declarative and non-declarative, and forms 2 for positive declarative only. Some examples are as follows:

(29)

    a.   <u>Complement sentence</u>:

       motǒá akâ:syá kaná áoíɛ   eíɔ   (cf. akâ:syâ 'he will say')

       Mũtũa will say that he bought a banana

    b.   <u>Causal sentence</u>

       ŋgáúá   nǒ:ndǒ áoíɛ   leû   (cf. ŋgáúâ 'I will cook')

       I will cook because he bought the food

    c.   <u>Conditional sentence</u>:

       ɛðéwǎ ŋgâ:kámâ ŋgâ:yâ   (cf. ŋgâ:kámâ 'I will milk')

       If   I milk   I will eat

    d.   <u>Simultaneous sentence</u>:

       kakǒlě akâ:mbóná ŋgékámá katě:nà   (akâ:mbónâ 'he will see me')

       Kakũlĩ will see me I milk the kid

       'Kakũlĩ will see me milking the kid.'

       kakǒlě ndǎna:mbóna   ŋgékámá katɛ̂:na   (ndǎna:mbónǎ 'he did not

                                                    see me')

       'Kakũlĩ did not see me milking the kid.'

    e.   <u>Purpose sentence</u>:

       nénɔ́:kǎ nékanǎ   néuɛ   mokátɛ́ (nénɔ́:kâ 'I came')

       I came in order that I might bake bread

       ndínɔ́:kà   nékanǎ   néuɛ   mokátɛ́ (ndínɔ́:kà 'I didn't come')

       'I didn't come in order to bake bread.'

3.3. <u>Exceptional tonal forms</u>. With the exception of very few items
(such as ŏːmóːnðé 'today'), all words in Kĩkamba have the same basic
phonetic tonal structure: the high/non-high opposition is used in all
syllables except the penultimate and final, when the range of possibilities
widens to four levels in specific cases. The range of alternatives (ex-
cluding gliding tones, which are predictable in penultimate and final
syllables except in verbal words) may be summarised as follows:

(30) <u>Preceding</u>   <u>Penultimate</u>   <u>Final</u>

    [ˊ]   [^{x}]   [^{x}]

    [ˉ]   [ˊ]   [ˊ]

       [ˉ]   [ˉ]

          [ˋ]

A common form which bears an unchanging extra-high tone is the negative
formative t$\overset{x}{\text{ì}}$. This item is used in forming the negative declarative
tenses, and we can thus explain why these tense forms regularly break the
conditions on tonal word-structure outlined above, e.g.

(31) Past today: nd$\overset{x}{\text{ì}}$nakãmã̰ 'I didn't milk' /N + t$\overset{x}{\text{ì}}$ + na + kám + a/

When placed in context with a following item, the word-final pattern will
alter according to general rules, but the extra-high tone of the negative
formative remains exceptionally constant:

(32)   nd$\overset{x}{\text{ì}}$nakáma ŋɔ̀ːmbɛ̀ 'I didn't milk the cows.'

3.4. <u>Tonal paradigms</u>. It is necessary to view the tone patterns of the
various verb tenses as basic formulae which are open to specific modifica-
tion depending on the type and tone of the subject-prefix, the basic tone-
class and type of the verb root, the presence or absence of object pre-
fixes, and the interplay of vowel and tone contraction, but which cannot
be viewed simply as the derived forms of strings of morphemes, unless we
allow an abnormally large amount of variation in their tonal realisations.
Related data are similarly treated in Maddieson et al. [1973]. Compare the
following Kĩkamba forms:

(33)

    a. <u>Present perfect</u> (1st person singular forms):

       <u>Positive</u>   <u>Negative</u>

Positive	Negative			
né:ŋgámê:tê	ndákámê:tê	/káma/	'milk'	[class 1]
néŋgwá:tê:tê	ndákwá:tê:tê	/kwá:ta/	'touch'	[class 1]
né:mbíðókê:tê	ndávíðókê:tê	/víðóka/	'attack'	[class 1]
né:nðitê:tê	ndáðitê:tê	/ðitâ/	'drown'	[class 2]
nénélá:tê:tyê	ndálá:tê:tyê	/lá:tya/	'fetch'	[class 2]

    b. <u>Past perfect</u>

nénénâ:kámȇ:tὲ	ndínǎ̌:kámȇ:tὲ
nénénâ:kwa:tȇ:tὲ	ndínǎ̌:kwâ:tȇ:tὲ
nénénâ:víðokȇ:tὲ	ndínǎ̌:víðokȇ:tὲ
nénénâ:ðitȇ:tὲ	ndínǎ̌:ðitȇ:tὲ
nénénâ:la:tȇ:tyὲ	ndínǎ̌:la:tȇ:tyὲ

We note that in the present perfect, class 2 forms with long initial vowels
(e.g. lá:tya 'fetch') pattern with class 1 roots, in opposition to class 2
forms with short initial vowels (e.g. ðitâ 'drown'). In the past perfect,
however, class 2 forms pattern similarly in opposition to the class 1 forms.
Comparing the two class 1 forms, víðóka 'attack' and káma 'milk', we
note how the patterning takes account of the extra syllable in the former
by extending the pattern accordingly; the pattern is extended differently
in both tenses.

    We also find that long-initial-vowel roots of both tone classes are regu-
larly distinguished tonally; high-toned forms are distinguished by the
presence or absence of a gliding tone in the past perfect forms above, while
the low-toned forms are kept distinct in the remote past:

(34)   <u>Remote past</u> (1st person singular forms):

       <u>Positive</u>

nénâ:kámíȇ	/káma/	[class 1]
nénâ:kwá:tíȇ	/kwá:ta/	[class 1]
nénâ:ðitíȇ	/ðitâ/	[class 2]
nénâ:lá:tísyȇ	/lá:tya/	[class 2]

3.5. <u>General features of verb tones</u>. i) All the dialects reinforce tonally
the distinctions between both sub-classes of high- and low-toned verb roots,

i.e. those with initial long vowels and those with initial short vowels.
These distinctions are clearly seen in the positive imperative and infinitive
nominalisation forms, as well as in particular tenses. Some examples are
as follows:

(35)

a. High-toned roots with initial short vowel

Kĩkũyũ	Cuka	Mwĩmbĩ	
rúɣa	rǔɣa	rǔɣa	'cook!'
koruɣá	korúɣà	korúɣà	'to cook'
kunékéra	kúnékĕra	kúnékĕra	'cover!'
ɣokunékera	ɣokúnékerà	ɣokúnekerà	'to cover'

b. High-toned roots with initial long vowel

rɔ́:ta	rɔ̌:ta	rɔ̌:ta	'dream!'
korɔ:tá	rorɔ́:tà	korɔ́:tà	'to dream'

c. Low-toned roots with initial short vowel

ɣorá	ɣorâ	ɣorá	'buy!'
koɣora	koɣorà	koɣorà	'to buy'
ɣorána	ɣorǎna	ɣorǎna	'marry!'
koɣorana	koɣoranà	koɣoranà	'to marry'

d. Low-toned roots with initial long vowel

ɕɔ̌:kya	tɕɔ̌:kya	ɕɔ̌:kya	'answer!'
ɣoɕɔ:kya	yotɕɔ:kyà	ɣoɕɔ:kyà	'to answer'

(ii) Verbs regularly bear the same tonal alternative forms as nouns,
and they alternate in similar fashion according to final tone pattern and
syntactic content, though these syntactic environments are in certain cases
different. There seems to be a high degree of uniformity in this condition-
ing; for supporting evidence of this see Appendix 1.

4. Tones in Other Word-classes in Kĩkamba

It can be shown that words in other word-classes bear basic tone pat-
terns that alternate regularly according to the same principles discussed
so far. Thus, an adjective or numeral, when functioning as a nominal quali-
fier (in which case it follows the noun in question) or as a complement after

a verb, may bear any of the tonal forms 2, 3 or 4. Some cardinal numeral qualifiers in Kĩkamba, with their tone classes, are as follows; numerals 1 — 5 carry concord prefixes, high-toned except for classes 1, 4 and 9, which (as in all the dialects considered here, and in other Bantu languages) are low-toned.

(36) -mwɛ̃ˣ   -H#A   'one'

     -élé   -H#B   'two'

     -tãˣtõˣˣ   -HL#A   'three'

     -nà[3]   'four'

     -tãˣˣ:nɔ̀ -HL#A   'five'

Examples in context:

(37) a. Tonal forms 4:

     né mo:ndo omwɛ̃ˣ   'it's one person'

     né ando ɛ́lɛ̂   'it's two people'(where the prefix a- contracts
                                     with -élé)

     né ando átãˣtõˣˣ 'it's three people'

     né ando ãˣnãˣˣ 'it's four people'

     né ando átãˣˣ:nɔ̀ 'it's five people'

  b. Tonal forms 3:

     né ando ɛ́lɛ̃ˣ váãˣ 'there are two people here'

Examples can be given to indicate that the same is true not only for adverbs and conjunctions in Kĩkamba, but also for items of all word-classes in other dialects. Some Kĩkamba examples are as follows (tonal forms are indicated in parentheses beneath the word in question):

(38) a. Adjective: né mokúvɛ̂   'he's short'
                 (4)

           né mokúvɛ̃ˣ monɔ̃ˣ 'he's very short'
               (3)   (2)

---

[3]This form may be -LL#A with a low-toned prefix, or -HL#A with a high-toned prefix.

b. Adverb: ɛ́ɛ́ka metókê   'he did it promptly'
                     (4)

            ɛ́ɛ́ka metókě̆ váá̆   'he did it promptly here'
                     (3)   (2)

c. Adjective: tí̆ mokúvé   'he's not short'
                    (2)

              tí̆ mokúvé monɔ̆   'he's not very short'
                    (2)   (2)

d. Adverb   ndǎnɛ̂:ka metóké   'he didn't do it promptly'
                          (2)

             ndǎnɛ̂:ka metóké váá̆ 'he didn't do it promptly here'
                          (2)   (2)

5. Tones in Complex Sentences

The tones of verbs before various sentence boundaries have been exemplified in section 3. In coordinate and subordinate sentences in Kĩkamba, the same variations in tonal forms are found as in main clauses or simple sentences, subject to one major constraint: that the forms 3 and 4 are restricted to follow positive declarative verbs only. If the verb form is inherently subordinate (i.e. restricted to occur only in subordiante sentences), then the forms 2 must be used in all places in the subordinate sentence. Kĩkamba, like many other Bantu languages, possesses verb forms that can be used without conjunctions to indicate forms of coordination and subordination. Some examples are seen in sentences employing positive declarative verb forms and hence maintaining the forms 3 and 4 immediately following the verb.

(39) a. Complement sentences:
        motóǎ áísyɛ kaná áoíɛ eiò   'Mũtũa said that he bought the
                            (4)   banana.'

        Compare the negative:
        motóǎ áísyɛ kaná ndǎnaoa eio 'Mũtũa said that he hadn't
                                   (2)   bought the banana.'

  b. Simultaneous ke- tense:
        kakólě̆ aná:mwɔ́:nyɛ aíkámá totě̆:nà 'Kakũlĩ saw him milking the kids.'
                                       (4)

Note that the positive-declarative forms are used where the subjects of the main and subordinate sentences are identical (this is a general feature of all the dialects that maintain these tonal distinctions):

(40) nééeva:nde:tɛ ndátâ:nè akééõyá   totê:na
                        (3)   (2)

he was leaning on a stick while herding kids

Again, where the object of the main clause and the subject of the sub-
ordinate is overtly expressed (other than as a prefix to the main verb),
then the forms 2 must follow the subordinate verb. To generalise, only
one item may bear the forms 3 or 4 in a construction that is not viewed as
two separate units (like a conditional sentence); if there is an item
following the main verb before the subordinate, then, given that the verb
is positive declarative, the forms 3 will be used; any item then follow-
ing the subordinate verb will bear the tonal forms 2. If no item inter-
venes after the main verb, then the forms 3 (or 4 if utterance-final) will
follow the subordinate verb. Compare the following:

(41) anâ:mwɔ́:nyɛ mõ̂:lwã akékámá totê:na
                    (3)   (2)

'He saw Mūlwa milking the kids.'

Note also the following conditional form which maintains the modal tone-
reinforcement because the subordinate sentence employs a positive declara-
tive verb (its form is indicated in parentheses):

(42) éõéwã ŋgâ:kámá   totê:nà ŋgâ:yâ
            (indefinite future)   (3)

'If I milk the kids, I will eat.'

Some examples follow of subordinate forms which neutralise the tonal dis-
tinctions after the verb, employing inherently subordinate tenses:

(43) a. <u>Emphatic sentence</u>:
        evũkũ̃ né yɔ̃ oné:ŋgíɛ mó:lwa
        book   it give   (2)

'It was a BOOK he gave to Mūlwa.'

   b. <u>Consecutive sentence</u>:
        nenɔ́ɔkyɛ nenáúá mokáté na nénâ:yá mbɔ:sɔ
        come   bake   (2)   and eat   (2)

'I came and baked bread and ate some beans.'

   c. <u>Purpose sentence</u>:
        nénɔ́ɔkã̃ nékanã̃ néuɛ mokáté
                                (2)

'I came in order to bake bread.'

d. Conditional sentence:

nǎ:kámǎ̃ katɛ̂:na ǒ:nɛ̌ kakǒlɛ̌ akǎ:sɛ́ŋâ
      (2)

'If I milk the kid tomorrow, Kakũlĩ will be surprised.'

Again, these facts are generalisable for the whole group of dialects, sub-
ject to the restrictions imposed on the variety of tonal forms by each
particular dialect. Thus, Tharaka and Imenti have simplified the opposi-
tions to only three. In the rest, however, similar tonal reinforcement of
positive declarative forms is employed.

6. Imperatives

    The forms of imperative expression are non-positive-declarative and
involve only the tonal forms 2 following them. They additionally alternate
the sentence-final [ˆ] tone, where used, to [ˣ] in context, like negative
declarative and other non-declarative verb forms.

(44) a. Positive: káma   'milk!'

                    kráma katɛ̂:na   'milk the kid!'
                              (2)

   b. Negative: ndoka:kámɛ̂   'don't milk!'

                    ndoka:kámɛ̂ˣ katɛ̂:na 'don't milk the kid!'
                                     (2)

Compare also the following:

(45)   ndoéǎˣ mba:kěˣ   'buy me some snuff!'
               (2)

     ndoéǎˣ mba:ké mbéú   'buy me some nice snuff!'
               (1)   (2)

     ndoéǎˣ mba:ké ya sumû:ne 'buy me 50 cents' worth of snuff!'
               (1)   (2)

     nɛ́:ŋga moká ɲo:mbá   'give the wife a house!'
        (2)   (2)

    These are general features of all the dialects. Another factor, exem-
plified in the forms in section 3.5, is that the tones of positive imperative
verb forms (compared with the infinitive nominalisations, which bear
declarative tones) regularly have unique patterns that may involve extra-
high non-final tones and level (non-falling) final low tones. These

patterns, where used, are inherently peculiar to imperative forms, though again variations according to verb class and sub-type are predictable, given the basic paradigm.

7.   Interrogative Expressions

Interrogatives can usefully be divided into those which involve an overt question word (WH-questions for convenience), and those that do not, but involve tonal modification only.

7.1. _WH-questions_. When the question word is sentence-initial, the emphatic forms of the verb are used (which are inherently subordinate), so that the forms 2 only are used after the verb. When the question word follows the verb (usually sentence-finally), the declarative verb forms are used, so that the tonal forms 3/4 are employed in a positive environment.

(46)   nóo óyíɛ katɛ̂:na   'Who stole the kid?'
                      (2)

        óyíɛ katɛ̂:nà naao   'He stole the kid with whom?'
                  (3)

        motóâ óyíɛ katɛ̂:nà áta 'How did Mūtūa steal the kid?'
                          (3)

        ánɛ́:ŋgíɛ mǒ:lwã̂ tɕã̂ǒ   'What did he give to Mūlwa?'
                      (3)

7.2. _Questions without a question word_. In Kĩkamba, such questions employ an expanded tonal register, so that high tones are higher than in statements and commands (given that there is no special raising of pitch for paralinguistic purposes). Only two tone levels are utilised in any position: [ˣ] and [⁻]. The rule for deriving these tones from underlying forms is simple:

(47) Question rule: /H/ → [ˣ]

Gliding-tone formation takes place as in declarative sentences. Compare the following base forms and their realisations in statements and direct questions:

(48) a.   -HL#A   [ndɔ̂:tɔ̀]   (Statement)
          /ndɔ́:tɔ/   →
          'dream'   [ndɔ̂:tɔ]   :   (Question)

(48) con't.

	/kwá:ka/ →	[kwá̽:ká̽]	(Statement)
	'to build'	[kwá̽:ká̽]	(Question)
b.	-HL#B	[katɛ̂:na]	(S)
	/katé:na/ →	[katɛ̽:na]	(Q)
	'kid'		
c.	-LL#A	[mo͞o:ndò]	(S)
	/mo:ndo/ →	[mo:ndo]	(Q)
	'person'		
d.	-LL#B	[eio]	(S)
	/eio/ →	[eio]	(Q)
	'banana'		
e.	-H#A	[motwɛ̽]	(S)
	/motwɛ́/ →	[motwɛ̽]	(Q)
	'head'		
f.	-H#B	[moká]	(S)
	/moká/ →	[moká̽]	(Q)
	'wife'		

Where the tonal forms above are identical in their tone-marking for both
statement and question forms, it must be remembered that the interrogative
tones are invariably higher than their non-interrogative counterparts. The
interrogative forms of verbs and all other words are derived in the same
manner:

(49)

a.	-LL#A	[néné̂:káme͡:tɛ̀]	(S)
	/néné̂:káme tɛ/ →	[né̽né̽:ká̽me:tɛ]	(Q)
	'I have milked'		
b.	-H#B	[né:ŋgámiɛ̂]	(S)
	/né:ŋgámiɛ́/ →	[né̽:ŋgá̽miɛ̽]	(Q)
	'I milked'		
c.	-HL#A	[ndína:ká̽mâ̽]	(S)
	/ndí̽na:káma/ →	[ndí̽na:ká̽mâ̽]	(Q)
	'I didn't milk'		

Examples of simple sentences:

(50) moká né moa:sâ   'the wife is tall'
      moká̽ né̽ moa:sá̽   'is the wife tall?'

ŋɔ̃:mbɛ̀ tↃ̆ nða:ta   'the cow isn't barren'

ŋɔ:mbɛ tↃ̆ nða:ta   'isn't the cow barren?'

7.3. <u>Generalisations for the dialect group</u>. The functions of tone in
WH-questions in Kīkamba are the same for all dialects, though again Imenti
and Tharaka have neutralised the basic tonal oppositions, both between
forms found sentence-finally or not, and between items immediately follow-
ing a positive declarative verb or not.

With regard to non-WH-questions, tone is utilised more noticeably in
regularly being the sole marker of the question. The use of a raised
tonal register, as noted in Kīkamba, is common for all speakers, though in
some other respects the facts outlined above represent some unusual features
compared to the other dialects. The following points should be noted.

i) Of the group, only Kīkamba involves tone-marking on more than the
final element in the interrogative sentence.

ii) Kīkūyū differs from the rest of the dialects, as already seen,
in certain details, and one of these affects non-WH-questions. The down-
stepping which can mark the syntactic boundary between certain main and
subordinate clauses is restricted to negative environments in such questions.
A sentence is "negative" in this sense when the first verb of a consecutive
series or the main verb in a sentence with subordination is negative.

iii) Kīkūyū differs again in marking non-WH-questions by processes
which involve tone-<u>lowering</u>, while all other dialects mark questions by
tone-<u>raising</u>. Compare the following Kīkūyū examples with those for Kīkamba
given above.

(51)   <u>Statement</u>   <u>Question</u>
        né káŋɛrí   né káŋèrì   'is it Kang'eri?'
        né:ɲjátá   né:ɲjátà   'is it a star?'
        né βíriβiri   né βíriβirì   'are they chillies?'
        né móɣɛranyá   né móɣɛranyà   'is it the examiner?'

iv) All dialects except Kīkamba employ different question forms
(for at least one tone-class of word) depending on whether the sentence
polarity is positive or not (again, citation forms are treated as non-
positive; it will be recalled that citation statement forms have tonal

forms 2, as all subject items do). Compare the Kĩkũyũ non-positive forms
of the items in (51):

(52) Statement   Question

ndirɔ:ňá káŋɛrí   ndirɔ:ňá káŋɛrì   'didn't I see Kang'eri?'

   "   ɲjátá   "   ɲját̃à   'didn't I see a star?'

   "   βíriβiri   "   βíriβirì   'didn't I see chillies?'

   "   móγɛranya   "   móγɛranyà 'didn't I see the examiner?'

8. Conclusion

Kĩkũyũ can be assumed to have undergone certain sound changes, most of
which are shared by neighbouring dialects. Thus, whereas prenasalised voice-
less stops are found in the northern group of dialects, Kĩkũyũ has lost these
sounds by voice-assimilation in nasal-compounds, as have Embu, Mbeere, and
Kĩkamba; e.g.

(53)	Kĩkũyũ	Embu	Kamba	Cuka	Mwĩmbĩ	Tharaka	Imenti
'firewood'	rokó	rokó	okŏ	rokô	rokó	rokó	rokó
pl.	ŋgó	ŋgó	ŋgŏ	ŋkô	ŋkó	ŋkó	ŋkó
'neck'	ŋgí:ŋgó	ŋgí:ŋgó	ŋgí:ŋgó	ŋkí:ŋgó	mokí:ŋgó	ŋkí:ŋgó	ŋkí:ŋgó
'breast'	ɲɔ:ndɔ	ɲɔ:ndò	ɲɔ̃:ndò	ɲɔ̃:ntò	ɲɔ:ntò	ɲɔ:nto	ɲɔ:ntò
'heart'	ŋgɔró	ŋgɔ̃rò	ŋgɔ̃ɔ̃	ŋkɔ́rò	ŋkɔ́rò	ŋkɔ́ro	ŋkɔ́rò
'person'	mo:ndo	mo:ndò	mõ:ndò	mõ:ntò	m̄tò	m̄to	m̄tò

Unique to Kĩkũyũ, however, is the tone-shift, exemplified in (23) of
section 2.5. above, whereby LHL words have shifted to LLH. A possible
source of this shift may be historical close-contact with the Maasai who
occupied land adjacent to that settled by the Kĩkũyũ. The most conservative
Kĩkũyũ dialects, both tonally and segmentally, are in the northern area.
Benson [1964] marks specially a large number of
forms attested only in Northern Kĩkũyũ, together with a number of loanwords
from Maasai. Some of the words peculiar to Northern Kĩkũyũ are also loan-
words from Maasai; e.g.

(54) ɲaγaitiŋo "good or bad but plentiful beyond description — originally
                  a Maasai battle-cry meaning 'I have come, hold on, they
                  shall not pass'"

(54) cont.

ŋgera   "skin-cap"

mairutie "warrior's feather-cape"

moiti   "expression of astonishment at any untoward event".

Maasai is a Nilotic language (see Tucker and Mpaayei [1955]), and the
phonetic forms of tone involve basically two distinct levels and a process
of downstep between adjacent high tones. In non-questions, a sentence-final
low tone becomes extra-low [ˋ]. The major function of tone is to distin-
guish the subject from the non-subject (indirect and direct object and the
citation form). Various alternations take place:

(55)

	Absolute	Subject	
a.	ɛmbártá	ɛmbartá	'horse'
b.	ɩŋápétà	ɩŋapetá	'posts'
c.	ɔláçê	ɔlaçé	'path'
d.	entít'ó	entító	'girl'
e.	ɛŋkítéŋ	ɛŋkítèŋ	'cow'
f.	eŋkitók	eŋkítòk	'woman'
g.	isirkôn	isírkòn	'donkeys'
h.	ɛlɔ́ŋɔ̀	ɛlɔ́ŋɔ̀	'shield'
i.	ɩlarripók	ɩlárrípók	'guards'
j.	ɔltʋŋánì	ɔltʋ́ŋání	'person'
k.	ɔlmɛʋ́t	ɔlmɛ́ʋ́t	'giraffe'
l.	ɔ́lkírɔ́bî	ɔlkɩrɔbì	'common cold'

The subject forms neutralise the distinctions of the absolutes, and several
forms of tone-change are involved. Several classes involve what is called
tone-reversal; thus, LLH in (55f.) becomes LHL in the subject form; HHHHL
of (55l.) becomes LLLL. Furthermore, the inventory of possibilities for
alternating tone patterns to mark the cases is increased by reversing the
absolute and subject patterns to mark a different class. Thus, (55d.) and
(55k.) are so reversed; and so are (55a.) and (55i.), and (55e.) and (55j.).
Often (55h.) displays the alternative realisations of the high+low sequence.

Maasai is thus a possible source, through contact, of some of the facets
of the Kĩkũyũ tone system (the tone-shift and the phonetic system of two

levels with downstep) which distinguish it from the rest of the Central Kenya Bantu languages.

We note that Clements [1976] describes an analogous situation in respect of certain Ewe dialects (Niger-Congo, Kwa). Aŋglo Ewe marks certain constituent-structure boundaries (in fact very similar ones to those exemplified above in respect of the group of Bantu languages) by a preceding extra-high tone (EH). Other dialects instead incorporate a downstep feature across the same boundaries. Clements notes that these two processes achieve the same phonetic result, viz.

(56)   EH + H   or   H + ˈH   =   [⁻ ⁻]

and suggests that the historical development might be from the downstep to the fourth-level stage by a fossilization of the distinction between the two like tones across the boundary.

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APPENDIX 1

Mwĩmbĩ

Verb forms 1   Verb plus item in its own sentence, including all simple
                sentences, and before the following subordinate sentences:

        simultaneous ke- prefix tenses

        áte   complement sentences

        néonto causal sentences

        mbɛrɛ ya 'before' sentences

        kɛ:ndã purpose sentences

Verb forms 2 (Pos.)
Verb forms 4 (Neg.)   Sentence-final verb form before:

        kiɲá 'until' sentences

        consecutive and conjoined (na) sentences

        verb in concessive (na tense) sentence before the
        main clause

        verb in conditional clause before main clause

        verb in relative clause before main clause

Verb forms 3 (Pos.)
Verb forms 5 (Neg.)   Verb used utterance-finally.

Embu

Verb forms 1   Verb plus item in its own sentence, including all simple
                sentences, and before the following subordinate sentences:

        simultaneous sentences

        ate   complement sentences

        néondo causal sentences

        mbɛré ya 'before' sentences

        néɣwɔ̃ purpose sentences

        ŋgiɲã 'until' sentences

        wanaɣotwéka concessive sentences

Verb forms 3   Verb before the following environments:
                    negative verb plus consecutive and conjoined sentences
                    negative relative verb plus main clause
                    negative conditional verb plus main clause

Verb forms 5   Verb in the following environments:
                    positive verb plus consecutive and conjoined sentences
                    positive relative verb plus main clause
                    positive conditional verb plus main clause.

Imenti

Verb forms 1   Verb plus item in its own sentence, including all simple
               sentences, and before the following subordinate sentences:
                    simultaneous sentences
                    áte complement sentences
                    tɔntɔ causal sentences
                    kiɲã̌ kɛðɛ́rã̌ concessive sentences

Verb forms 2   Verb before the following subordinate sentences:
                    mwaŋkã̌ 'until' sentences
                    na , ĕnde conjoined sentences
                    mbɛrɛ ya 'before' sentences
                    kɛnda purpose sentences
               A subordinate relative or conditional tense before a main
               clause

Verb forms 3   Any verb form used sentence-finally.

Tigania

Verb forms 1   Verb plus item in its own sentence, including all simple
               sentences, and before the following subordinate sentences:
                    áte complement sentences
                    néonto causal sentences
                    kiɲã̌ kɛ́ðɛ̌ra concessive sentences
                    mbɛrɛ á 'before' sentences
                    kɛ:nda purpose sentences

Verb forms 2   Verb before the following:

       mwaŋká̈ 'until' sentences

       na , ̈ende conjoined sentences

       consecutive tenses

   A subordinate relative or conditional tense before a following main clause

Verb forms 3   Any verb form used sentence-finally.

Mĩĩtĩne

Verb forms 1   Verb plus item in its own sentence, including all simple sentences, and before the following subordinate sentences:

       simultaneous sentences

       mwaŋká̈ 'until' sentences

       kiɲá̈ kë̈ð̈ɛrwá̈ concessive sentences

       mbɛrɛ 'before' sentences

       kɛ:ndá̈ purpose sentences

   Verbs in certain tenses only (not generalisable) before:

       na , ̈ende conjoined sentences

       áte complement sentences

       néonto causal sentences

Verb forms 2   Verbs in the remaining tenses before:

       na , ̈ende conjoined sentences

       áte complement sentences

       néonto causal sentences

   A subordinate relative or conditional tense before a following main clause

Verb forms 3   Any verb form used sentence-finally.

Mbeere

Here verb forms 1 are used in <u>all</u> non-sentence-final environments, including:

> verb before item in its own sentence, and before the following subordinate sentences:

>> simultaneous sentences

>> consecutive sentences

>> kiɲa ya 'until' sentences

>> ate complement sentences

>> néondo wá causal sentences

>> wanarérya concessive sentences

>> mbɛrɛ yá 'before' sentences

>> né kɛ:nda purpose sentences

> any relative or conditional tense before a following main clause.

COMPARATIVE RECONSTRUCTION OF MANDEKAN

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In this article nine languages in the Mandekan subgroup are
used to reconstruct the phonological system of Proto-Mandekan,
including consonants and vowels in all positions. The stand-
ard comparative method is used. Correspondences supporting
the reconstruction are presented along with an indication of
how many such correspondences are found in the data. Also
included are charts of the reconstructed phonological system
and word lists at each stage of the reconstruction. Irregular
phonological matchings are also discussed in detail in separate
sections. This is to be the first in a series of forthcoming
papers aimed at reconstructing the phonological system of
Proto-Northern Mande, of which the Mandekan languages form a
subgroup.

1. Introduction

    The objective of this paper is to reconstruct the proto-consonant and
vowel system of a group of West African languages known by the cover term
Mandekan. It is to be the first in a series of papers aiming at reconstruct-
ing the larger subgroup of languages to which Mandekan belongs: Northern
Mande. A survey of the linguistic relationship of this subgroup to other
African languages, as well as an overview of the geographical setting of
these languages, will provide the reader with a better feel for the data to
follow.

    In 1963 Joseph Greenberg completed a classification of African languages
which resulted in the assignment of all African languages into one of four
major families: Afro-Asiatic, Nilo-Saharan, Khoisan or Niger-Kordofanian.
It has been well argued by Welmers [1958] that Mande may well have been the
first major language group to branch from the Niger-Kordofanian family.
Further historical developments saw the Mande group branch into two
divisions: Northern-Western and Southern-Eastern. Southern-Eastern later
divided into the Southern and Eastern subgroups, while Northern-Western
divided into the Northern and Southwestern subgroups.

The tree below shows the further development of Northern Mande:

Northern Mande

```
                    Northern Mande
                          /\
                         /  \
                        /    \
                       /      \
                      /        \
                     /          \
                    /            \
                   /              \
                  /              / \
                 /\             /   \
                /  \           /     \
               /    \         /       \
        /\         /|\      /\      Mandekan
       /  \       / | \    /  \        /\
 Susa Yalunka  Hwela Numu Ligbi  Vai, Kɔnɔ      /  \
 (Group A)     (Group B)         (Group C)   Kuranko  Core Group
```

Susa Yalunka   Hwela Numu Ligbi   Vai, Kɔnɔ   Mandekan

(Group A)   (Group B)   (Group C)

                                                    Kuranko   Core Group

The Northern subgroup of the Mande language group is the prime focus of this study. The languages belonging to Northern Mande are spoken in the heart of West Africa, primarily in and around the countries of Mali, Sierra Leone, Guinea, Gambia, Ivory Coast, and Ghana.

1.1. <u>Materials and method</u>. The material used in this reconstruction was gathered by Long [1971] from a variety of different sources and includes 17 Northern Mande languages. Although a Swadesh list of only 100 words was used, the insufficiency of the word list should be partially overcome by the breadth in number of languages used. Furthermore, a larger word list would have required much greater length of presentation than was possible.

The procedure used in this paper is standard comparative reconstruction methodology. The languages were subdivided into small workable groups of two to five languages each, suggested by the lexico-statistic evidence provided in Long's paper. When Long's calculations seemed questionable for one reason or another they were supplemented with calculations made by Wm. E. Welmers and myself.[1] It should be noted that slight to moderate errors

---

[1]We found a number of reasons for doubting some of the statistics presented by Long. First of all, we found some words to be listed wrong, such as the word for 'five' appearing under the column for 'four'. Secondly, certain figures did not appear to add up right. For example,

in percentage are not nearly as crucial in the determination of grouping for the reconstruction process as they are for the relative classification of languages, since the reconstruction process will ultimately bring all related languages under the scope of comparison with each other.

The 17 languages were first broken down into four groups: (1) <u>Mandekan</u>: Xassonke, Maninka, Bambara, Dyula, Konyanka, Wassulunka, Diakhanka, Mauka and Bo; (2) <u>Group C</u>: Kuranko, Kono and Vai; (3) <u>Group B</u>: Hwela, Numu and Ligbi; (4) <u>Group A</u>: Susu and Yalunka. Mandekan was then divided into two groups because of its size: (1A) <u>M1</u>: Xassonke, Maninka, Bambara and Dyula; (1B) <u>M2</u>: Konyanka, Wassulunka, Diakhanka, Mauka and Bo.[2]

Languages were considered as belonging to the Mandekan group on the basis of cognate percentage maxima between them ranging from the low 80's to the mid 90's. While a few comparisons showed percentages below the low 80's (i.e. Bo:Xassonke = 75-79%), a comparison of either of these languages to most of the core group shows much higher cognate percentages (i.e. Bo: Bambara = 88-90% or Xassonke:Bambara = 82-88%).

Kuranko, Kono and Vai were originally grouped together because Long's calculations show a closer relationship between them than with the other languages. Recent calculations done by Welmers and myself, however, indicate a closer relationship of Kuranko to Mandekan than to either Kono or Vai, though Kono and Vai are closer to Kuranko than they are to any other

---

Long shows a relationship of 49-69% for Mandinka:Mauka, 81-85% for Mandinka: Bo, and 84-89% for Mauka:Bo. This would mean that of two languages which differ from each other from 11-16% (Mauka:Bo), one differs from Mandinka at about 41% and the other differs from Mandinka at about 17% (averages of minima and maxima). This indicates a percentage spread between the two languages of 24% in their respective relationships to Mandinka, yet the maximum differentiation indicated by Long is 16% between the two languages. Thirdly, figures did not seem to match with those anticipated by Welmers, which naturally led to making some of our own cognate counts.

[2] The groups to be reconstructed were labeled A, B, C, and Mandekan for two good reasons: (1) Of the 4 groups, only Mandekan has a generally accepted cover term in the literature and (2) The labeling of A, B, C will allow the reader to keep in mind what level in the reconstruction he is dealing with, since A represents the first branch-off from Northern Mande, B the second, C the third and Mandekan the fourth. I am indebted to Wm. E. Welmers for the suggestion.

language. As noted above, this ultimately makes no difference in the reconstruction process.

Hwela, Numu and Ligbi show relationships with each other centering in the low 80's, whereas their relationships to the other languages are no better than the mid 50's.

Susu and Yalunka relate at 83-91%, while comparing them to any other language yields no closer relationship than the mid 40's to low 50's.

After having reconstructed the groups above, the proto-forms will be brought together in the following manner. The two proto subgroups, *M1 and *M2, showing the closest relationship, will be used to reconstruct Proto-Mandekan. In this article we will deal only with the reconstruction of Proto-Mandekan. In a future paper Proto C, B and A will be stirred in respectively, rendering Proto-Northern Mande.

A word about correspondences. In any reconstruction there are matchings which do not parallel correspondences and are therefore aberrant for known or unknown reasons. When this occurs, a tentative guess at the proto segment will be made, with the segment reconstructed in this fashion underscored. For example, if a correspondence [o:o:o:o] is reconstructed *\/o/, what should be done with [u:o:o:o] if cognation is sure and the matching is unique? A reasonable guess will be made for this segment and it will be underscored in the reconstruction (i.e. *bo̱lo). It should be remembered that these word lists come from many sources and were collected as early as 1921, so some of the transcriptions may well be skewed. Tentative reconstructions of this nature may serve to level out the possible inconsistencies, while underscoring will serve to remind the reader that the reconstructed segment is tentative. Matchings of this nature will be discussed following presentation of the correspondences.

2. Reconstructing Mandekan — M1

As mentioned above, nine languages have been used here to represent the Mandekan group. These nine languages were subdivided into two subgroups to facilitate the comparative method. The first subgroup is made up of Xassonke (X), Maninka (M), Bambara (B) and Dyula (D).

2.1. M1 consonants. In the following reconstruction three examples at most

will be given to illustrate the correspondence in question due to the magnitude of this paper. To the right of the examples will be a number indicating the number of such correspondences found in the 100 word list.

Table 1 — Initial Consonants

Labials   No. of Corr.

		22.	'hand'	28.	'navel'	56.	'big'	
*/b/	X:	b	ulo	b	ata	b	on	7
	M:	b	olo	b	ara	b	on	
	B:	b	olo	b	ara	b	on	
	D:	b	oro	b	ara	b	on	

		7.	'person'	9.	'woman'	75.	'hear'	
*/m/	X:	m	ɔgɔ	m	uso	-	--	3
	M:	m	ɔgɔ	m	oso	m	ɛn	
	B:	m	ɔgɔ	m	oso	m	ɛn	
	D:	m	ɔgɔ	m	uso	m	ɛ	

		55.	'dog'	73.	'stand'		
*/w/	X:	w	ulɔ	w	ule	2
	M:	w	ulu	w	uli	
	B:	w	ulu	w	uli	
	D:	w	uru	w	uri	

		11.	'father'	47.	'leaf'	58.	'black'	
*/f/	X:	f	a	f	itɔ	f	in	5
	M:	f	a	f	ida	f	in	
	B:	f	a	f	ura	f	in	
	D:	f	a	f	la	f	in	

Dentals

		10.	'child'	18.	'mouth'	57.	'small'	
*/d/	X:	d	enden-ŋɔ	d	a	d	ɔgɔ	5
	M:	d	en	d	a	d	ɔgɔ	
	B:	d	en	d	a	d	ɔgɔ	
	D:	d	en	d	a	d	ɔgɔ	

		17.	'ear'	33.	'fire'	39.	'sun'	
*/t/	X:	t	ulo	t	a	t	ilo	6
	M:	t	olo	t	a	t	ele	
	B:	t	ulo	t	a	t	ile	
	D:	t	oro	t	a	t	ɛre	

Dentals

		5. 'four'	20. 'tongue'	49. 'milk'	
*/n/	X:	n aani	n ɛn-ŋɔ	n ɔnɔ	6
	M:	n aanin	n ɛn	n ɔnɔ	
	B:	n aani	n ɛn	n ɔnɔ	
	D:	n aani	n ane	n ɔnɔ	

		41. 'night'	43. 'smoke'	54. 'snake'	
*/s/	X:	s u-o	s isi-o	s a	6
	M:	s u	s isi-o	s a	
	B:	s u	s isi	s a	
	D:	s u-ra	s isi	s a	

Resonants

		6. 'five'	69. 'lie'		
*/l/	X:	l olu	l a		2
	M:	l oolu	l a		
	B:	d uuru	d a		
	D:	l oolu	l a		

Palatals

		16. 'eye'	19. 'tooth'	60. 'good'	
*/ny/	X:	ny a	ny in-ŋɔ	ny in	3
	M:	ny a	ny in	ny in	
	B:	ny a	ny in	ny i	
	D:	ny ɛ	ny in	-- --	

		31. 'blood'	45. 'rope'	93. 'long'	
*/j/	X:	j ɛlo	j ulu	j an	5
	M:	j eli	j ulu	j an	
	B:	j oli	j uru	j an	
	D:	j oli	j uru	j an	

		77. 'see'	95. 'here'	46. 'tree'	
*/y/	X:	j e	j an	y irɔ	3
	M:	y e	y an	y iri	
	B:	y e	y an	y iri	
	D:	y e	y an	y iri	
		elsewhere		/ _i	

Velars

		2. 'one'	13. 'head'	99. 'in'	
*/k/	X:	k elen	k un-ŋɔ	k ɔnɔ	10
	M:	k elen	k un	k ɔnɔ	
	B:	k elen	k un	k ɔnɔ	
	D:	k ɛlɛn	k un	k ɔnɔ	

Velars | No. of Corr.

36. 'salt'   40. 'moon'   62. 'old'

*/k'/
x	ɔxɔ		x	aro		x	ɔto
k	ɔgɔ		k	aro		k	ɔrɔ
k	ɔgɔ		k	alo		k	ɔrɔ
k	ɔγɔ		k	ari		k	ɔrɔ

3

Lab.Vel.

59. 'white'   63. 'hot'   29. 'skin'

*/gb/
X:	xw	e		--	--		g	ulo
M:	gb	ε		--	--		gb	olo
B:	j	ε		g	an		g	olo
D:	gb	ε		gb	an		--	--

3

/_V
[+high]
[+front]

elsewhere

Table 2 — Medial Consonants

Labials

4. 'three'   38. 'stone'

*/b/
X:	sa	b	a		--	-	-
M:	sa	b	a		ka	b	a
B:	sa	b	a		ka	b	a
D:	sa	w	a		--	-	-

2

64. 'cold'   74. 'say'

*/m/
X:	--	-	-		xu	m	a
M:	su	m	a		ku	m	a
B:	su	m	a		ku	m	a
D:	su	m	a		koo	m	a

2

Dentals

28. 'navel'   67. 'new'   94. 'short'

*/t/
X:	ba	t	o		ku	t	ɔ		su	t	u
M:	ba	d	a		ku	d	a		su	d	un
B:	ba	r	a		ku	r	a		su	r	un-
D:	ba	r	a		ku	r	a		su	r	u

5

27. 'belly'   5. 'four'   49. 'milk'

*/n/
X:	ko	n	o		naa	n	i		nɔ	n	ɔ
M:	kɔ	n	ɔ		naa	n	in		nɔ	n	ɔ
B:	kɔ	n	ɔ		naa	n	i		nɔ	n	ɔ
D:	kɔ	n	ɔ		naa	n	i		nɔ	n	ɔ

5

Dentals   No. of Corr.

		43. 'smoke'		14. 'hair'		
*/s/	X:	si	s	i-o		kun-	s	igi		12
	M:	si	s	i-o		kun-	s	i		
	B:	si	s	i		kun-	s	igi		
	D:	si	s	i		kun-	z	igi		

/N_

Velars

		57. 'small'	68. 'sit'	82. 'cut'	
*/g/	X:	dɔ	g	ɔ	si	g	i	ti	g	ε	4
	M:	dɔ	g	ɔ	si	g	i	tε	g	ε	
	B:	dɔ	g	ɔ	si	g	i	ti	g	ε	
	D:	dɔ	g	ɔ	si	g	i	ti	g	ε	

		7. 'person'	70. 'sleep'	81. 'kill'	
*/g'/	X:	mɔ	g	ɔ	sinɔ	g	ɔ	fa	g	a	3
	M:	mɔ	g	ɔ	sinɔ	g	ɔ	fa	g	a	
	B:	mɔ	g	ɔ	sunɔ	g	ɔ	fa	g	a	
	D:	mɔ	ɣ	ɔ	sunɔ	ɣ	ɔ	fa	ɣ	a	

Resonants

		17. 'ear'	39. 'sun'	48. 'root'	
*/l/	X:	tu	l	o	ti	l	o	li	l	ɔ	11
	M:	to	l	o	te	l	e	li	l	in	
	B:	tu	l	o	ti	l	e	di	l	i	
	D:	to	r	o	tε	r	e	li	r	i	

Table 3 — Final Consonants

Dentals

		21. 'neck'	23. 'foot'	56. 'big'	
*/n/	X:	ka	n	-ŋɔ[3]	si	n	-ŋɔ	bo	n	16
	M:	ka	n		se	n		bo	n	
	B:	ka	n		se	n		bo	n	
	D:	ka	n		se	n		bo	n	

2.1.1. Discussion of M1 consonant irregularities. It is a well known axiom of linguistic theory that although phonetic change is regular, words tend to have their own histories, resulting in a paradoxical mismatch

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[3]The suffix -ŋɔ is a Xassonke innovation and not reconstructible in Proto-Mandekan.

between two real processes of linguistic change. Northern Mande is no
exception, which explains the need for a section on irregular matchings.
The following discussion will present certain irregularities in sure cog-
nates, as well as provide argumnets for tentative reconstruction of those
segments involved.

2.1.1.1. Labials. There are no exceptions to the labial correspondences
in initial position, and no labial consonants are found in Proto-M1 in
final position. In medial position there is one irregularity out of nine
occurences. The matching [b:b:g:ɣ] for 'meat' (35): (X) subɔ , (M) sobo ,
(B) sogo , (D) soɣo . (Henceforth the words will be arranged in the order,
from top to bottom, in which they are presented in the Swadesh list, with
no language labels given.) The first question to be answered is whether
these are indeed cognates. If not the matter is a simple one, since then
both a */b/ and */g/ are easily reconstructed. However, we are not certain
one way or the other. Assuming they are cognate, we might be tempted to
guess a labio-velar, except for the fact that there is no support in the
data for such a reconstruction, either in terms of the medial consonant
system of Proto-M1, or in terms of evidence from the other 13 languages.
Proto-M2, it will be shown, has the same difficulty with this correspond-
ence. There is some motivation for reconstructing a */b/ tentatively,
given the evidence from Group A (Susu-Yalunka), which reconstructs with
*/b/. If the proto form were */g/, Susu and Yalunka would have had to in-
novate [b] quite independently from those Mandekan languages which also
innovated [b]. Positing a proto */b/ is therefore a more probable recon-
struction than */g/.

A second seeming irregularity is found in [m:m:n#:m] for 'eat' (79):
dumu, damun, dun, dumu. In Bambara, however, final nasals are in reality
phonetically nasalised vowels. Further evidence for an historical [m] in
this word is the present participle 'eating', which is phonetically
[dumuni]. Clearly, this should be reconstructed as */m/.

Thirdly, the word for 'knee' (24) reveals a unique medial [mb]. Both
Groups A and C show exactly the same phonetic realisation of this cluster
in the cognate form, yet this is the only example in the Swadesh list
attesting to such a cluster. Certain types of attrition (e.g. [k] → [x])

between 'knee' in Ml and Group A point up its having been around in N.M. a good while, and make borrowing unlikely. It is at best a highly tentative ˮ/m/ and ˮ/b/, and should be entered with a question mark.

2.1.1.2. <u>Dentals</u>. Dentals in initial positions are extremely consistent. There is only one aberrance in twenty-four examples: [t:t:t:n] in 'name' (1) (tɔgɔ, tɔgɔ, tɔgɔ, nɔgɔ). The data in Ml and throughout Mandekan speak for */t/. The explanation for [n] in Dyula is unknown at this point.

The dental series has another similar example in medial position, where only two irregular matchings occur in fourteen examples. The word 'nail' (14) yields [n:r:n:n] (sonin-ŋɔ, sorin, sɔnin, sani). Again the overwhelming evidence from Mandekan and other languages, such as Ligbi, is for */n/.

The second irregularity in medial position is [t:d:r:l] in 'leaf' (14) (fitɔ, fida, fura, fla). This matching only differs from the */t/ correspondence in Dyula's [l], and is probably due to the contact of [f] with [r]. Such [Cl] clusters occur commonly in words syncopating medial vowels. Bambara, for instance, may have [tile] or [tle] for 'sun', but [Cr] clusters do not occur. This may have triggered an [r] to [l] change, a very frequent occurrence in languages of this family.

ˮ/n/ is the only final consonant in Proto-Ml, and in 16 occurrences there are no exceptions.

2.1.1.3. <u>Resonants</u>. */r/ is very difficult to reconstruct for *Ml which shows only one matching of [r:r:r:r] in 'tree': yirɔ, yiri, yiri, yiri. This is reconstructed as ˮ/r/ but only very hesitantly and entered with a question mark in the Proto-Ml consonant chart (section 2.3.).

Medial resonants, as the reader will discover, are a very sticky problem in N.M. Although there exist 11 examples of an [l:l:l:r] correspondence rendering */l/, there are three examples of [l:l:r:r], two examples of [r:r:l:r], one example of [l:l:l:l] and one of [l:r:r:-]. A chart is provided to illustrate these correspondences and matchings:

(1) <u>X</u> <u>M</u> <u>B</u> <u>D</u>

l	l	r	r	6.	'five':	lolu, loolu, duuru, looru;
				45.	'rope':	julu, julu, juru, juru;
				98.	'path':	sila, -----, sira, sira
r	r	l	r	40.	'moon':	xaro, karo, kalo, kari;
				84.	'sew':	xara, kara, kala, kara

(1) cont.

X	M	B	D			
l	l	l	l	2.	'one':	kelen, kelen, kelen, kɛlɛn
l	r	r	-	24.	'knee':	kumbalin, kumberen, kumbere, -------

The [l:l:l:l] matching may have an explanation in Dyula's close asso-
ciation with Bambara. Welmers [personal communication] suggests that the
borrowing of this particular word in this language area is widespread and
that it is not at all unlikely that the form in Dyula was thus influenced.
The proto segment was undoubtedly */l/.

[r:r:l:r] is trickier. The prevalence of [r] suggests a proto */r/.
The evidence from Southwestern Mande places this interpretation in doubt.
The word for 'moon' shows up in S.W.M. as [galon], indicating a probable
*/l/ reconstruction. It also appears as an [l:l:r:r:l] correspondence in
M2 and as [l] in Vai. Furthermore, both examples of this correspondence
occur in words with initial */k'/. None of the 11 regular */l/ correspond-
ences occur after */k'/, suggesting that this may well be a conditioned
variant of */l/ in this environment. The evidence together points strongly
toward a conditioned variant of */l/.

Of all the correspondences, [l:l:r:r] is the most confusing. */l/ is
suggested by Susu and Yalunka ([l:l]) and by Group C ([l:l:l]) for 'five'.
*/r/ is suggested by Susu and Yalunka ([r:r]) and by M2 ([r:r:r:l:-]) for
'path', while Group C suggests */l/ ([l:∅:l]). The evidence is strong for
reconstructing */l/ for 'five' and a bit weaker for reconstructing */r/
for 'path', yet they show a correspondence with each other in M1. However,
it would be difficult to reconstruct */r/ for 'path' for other reasons,
since this is the only example in the Swadesh list warranting such a re-
construction for M1, and a poor one at that. Positing an */l/ for 'path',
it appears what may have happened is that Group C retained the original
[l]. After the separation of Group C and Mandekan, an [l] to [r] change
began to take place, but only after Kuranko had separated from the core of
Mandekan. Susu and Yalunka (Group A), then, converged accidently. As
noted above, changes of [l] to [r] and the reverse are frequent in N.M.
languages. The word for 'rope' shows the same support as 'five'. Since
there is no apparent conditioning factor for this correspondence to differ

from the regular */l/ correspondence, we reconstruct a tentative */l'/.

The matching in (24) 'knee' is [l:r:r:∅]. Although cognate forms exist in Group A, the segment has been lost. Group C supports an */l/. M2 is mixed. Faute de mieux, we reconstruct a highly tentative */l'/.

2.1.1.4. Palatals. Only one of twelve initial palatal consonant correspondences is irregular: (53) 'fish': nyɛgo, jɛgɛ, jɛgɛ, yigɛn yielding an [ny:j:j:y] matching. Group C supports an */ny/ reconstruction, while Group A supports */y/. Only because it is more natural for [ny] to become [y] (loss of nasalisation) than the reverse (gain of nasalisation) is */ny/ selected as a highly tentative reconstruction, leaving accidental convergence to once again explain away the Group A [y] reflex.

2.1.1.5. Velars. Velar anomalies consist of [-:ky:c:c] for 'man' (---, kyɛ, cɛ, kyɛ) and 'sand' (kɛnyɛ, kinyɛ, cɛncɛn, cɛnjɛn) in medial position. Not much can be said about these, since correspondences such as (51) occur (e.g. 'egg': kilo, kili, kili, kiri) in which a high front vowel fails to palatalize [k]. Groups A, B and C suggest */k/ for 'man' and Group C the same for 'sand'. M2, however, shows some reflexes of [t] and [ty] for 'sand'. This is not as irregular as would seem at first blush. Bambara, for example, has free variation between [tile] and [kle] for 'day', and the proto form is undoubtedly [tile]. M2 is probably undergoing the same alternation. A */c/ is not proposed because nowhere else is it reconstructable, and furthermore, a change from [c] to [k] is less probable than the reverse. The tentative reconstruction for these forms is */k/.

2.1.1.6. Labio-velars. There are no examples of labio-velars other than what has been presented above.

A consonant chart will be presented after presentation of the vowels, allowing a presentation of the entire phonological system of Proto-M1 at one time to avoid reduplication.

2.2. M1 vowels. There are no initial vowels presented because none occur in the Swadesh list. The pronouns, monosyllabic vowels, will be treated as final consonants due to this language internal pattern.

Table 4 — Medial Vowels

Front

		19. 'tooth'	43. 'smoke'	48. 'root'	
*/i/	X:	ny [i] n-ŋɔ	s [i] si-o	l [i] lɔ	10
	M:	ny [i] n	s [i] si-o	l [i] lin	
	B:	ny [i] n	s [i] si-o	d [i] li	
	D:	ny [i] n	s [i] si	l [i] ri	

		10. 'child'	66. 'straight'		
?*/e/	X:	d [e] nden-ŋɔ	til [e] n		2
	M:	d [e] n	tel [e] n		
	B:	d [e] n	til [e] n		
	D:	d [e] n	ter [e] n		

		53. 'fish'	50. 'grease'		
?*/ɛ/	X:	ny [ɛ] go	- [-] -		2
	M:	j [ɛ] gɛ	k [ɛ] n		
	B:	j [ɛ] gɛ	k [ɛ] n		
	D:	y [i] gɛn	k [ie] n		

Mid

		4. 'three'	21. 'neck'	40. 'moon'	
*/a/	X:	s [a] ba	k [a] n-ŋɔ	x [a] ro	11
	M:	s [a] ba	k [a] n	k [a] ro	
	B:	s [a] ba	k [a] n	k [a'] lo	
	D:	s [a] ba	k [a] n	k [a] ri	

Back

		45. 'rope'	61. 'new'	91. 'what'	
*/u/	X:	j [u] lu	k [u] tɔ	m [u] n	9
	M:	j [u] lu	k [u] da	m [u] n	
	B:	j [u] ru	k [u] ra	m [u] n	
	D:	j [u] ru	k [u] ra	m [u] n	

		22. 'hand'	29. 'skin'	35. 'meat'	
*/o/	X:	b [u] lo	g [ú] lo	s [u] b	3
	M:	b [o] lo	gb [o] lo	s [o] bo	
	B:	b [o] lo	g [o] lo	s [o] go	
	D:	b [o] ro	- [-] --	s [o] ɣo	

		1. 'name'	7. 'person'	49. 'milk'	
*/ɔ/	X:	t [ɔ] go	m [ɔ] go	n [ɔ] nɔ	10
	M:	t [ɔ] go	m [ɔ] gɔ	n [ɔ] nɔ	
	B:	t [ɔ] go	m [ɔ] gɔ	n [ɔ] nɔ	
	D:	t [ɔ] go	m [ɔ] gɔ	n [ɔ] nɔ	

Table 5 — <u>Final Vowels</u>

<u>Front</u>   <u>No. of Corr.</u>

		34. 'water'	68. 'sit'	78. 'give'	
*/i/	X:	j [i] -o	sig [i]	d [i]	7
	M:	j [i]	sig [i]	d [i]	
	B:	j [i]	sig [i]	d [i]	
	D:	j [i]	sig [i]	d [i]	

		77. 'see'	
?*/e/	X:	j [e]	1
	M:	y [e]	
	B:	y [e]	
	D:	y [e]	

		44. 'sand'	82. 'cut'	92. 'not'	
*/ɛ/	X:	kɛny [ɛ]	tig [ɛ]	t [ɛ]	3
	M:	kiny [ɛ]	tɛg [ɛ]	t [ɛ]	
	B:	cɛnc [ɛ] n	tig [ɛ]	t [ɛ]	
	D:	cɛnj [ɛ] n	tig [ɛ]	t [ɛ]	

<u>Mid</u>

		4. 'three'	11. 'father'	18. 'mouth'	
*/a/	X:	sab [a]	f [a]	d [a]	13
	M:	sab [a]	f [a]	d [a]	
	B:	sab [a]	f [a]	d [a]	
	D:	sab [a]	f [a]	d [a]	

<u>Back</u>

		6. 'five'	41. 'night'	45. 'rope'	
*/u/	X:	loⱡ [u]	s [u] -o	jul [u]	5
	M:	looⱡ [u]	s [u]	julⱡ [u]	
	B:	duur [u]	s [u]	jur [u]	
	D:	loor [u]	s [u] -ra	jur [u]	

		9. 'woman'	17. 'ear'	22. 'hand'	
*/o/	X:	mus [o]	tuⱡ [o]	buⱡ [o]	3
	M:	mos [o]	toⱡ [o]	boⱡ [o]	
	B:	mus [o]	tuⱡ [o]	boⱡ [o]	
	D:	mus [o]	tor [o]	bor [o]	

		52. 'bird'	57. 'small'	70. 'sleep'	
*/ɔ/	X:	kɔn [ɔ]	dɔg [ɔ]	sinɔg [ɔ]	8
	M:	kɔn [ɔ]	dɔg [ɔ]	sinɔg [ɔ]	
	B:	kɔn [ɔ]	dɔg [ɔ]	sunɔg [ɔ]	
	D:	kɔn [ɔ]	dɔg [ɔ]	sunɔy [ɔ]	

2.1.1. <u>Ml vowel irregularities</u>. Much speculation will be advanced in this section in an attempt to offer some possible and plausible explanation for irregularities. It is, of course, impossible to be certain of these interpretations without many more confirming examples.

2.2.1.1. <u>Front</u>. High front vowels in medial position are irregular in seven of seventeen cases. Four of these examples involve a change of [i] to [u] and the other three involve a change from [i] to a lower front vowel [e] or [ɛ].

The [i] to [u] change twice involves a [u:i:i:i] correspondence and twice an [i:i:u:u] correspondence:

(2)

X	M	B	D		
u	i	i	i	26.	'breast': sun-ji-o, sin, sin, sin
u	i	i	i	3.	'two': fula, fila, fila, ----
i	i	u	u	70.	'sleep': sinɔgɔ, sinɔgɔ, sunɔgɔ, sunɔyɔ
i	i	u	∅	47.	'leaf': fitɔ, fida, fura, fla

Note that Maninka alone does not undergo this change. Little can be said about these correspondences that is not extremely ad hoc. For example, 'two' and 'leaf' provide almost identical environments, yet [i] becomes [u] in Xassonke [fula] but not in [fitɔ]. Likewise, [i] becomes [u] between [s] and [n] in Xassonke [sun-ji-o] but not in [sinɔgɔ], whereas Bambara does the reverse, remaining [i] in [sin] but becoming [u] in [sunɔgɔ]. Environments which are nearly exactly the same treat the same vowel in opposite fashion in Xassonke, Bambara and Dyula. However, we can be quite certain despite this deviant behavior that the proto-segment in these cases was indeed */i/, since Group A supports */i/ for 'breast', 'two' and 'sleep' and Group C further supports it for 'breast' and 'two'. Although no cognate is attested for 'sleep' in the other groups, it can be implied from the general pattern that the proto form was */i/.

The [i] to lower front vowel change in medial position occurred in three words:

(3)

X	M	B	D		
i	e	i	ɛ	39.	'sun': tilo, tele, tile, tɛre
i	e	i	e	66.	'straight': tilen, telen, tilen, teren
i	ɛ	i	i	82.	'cut': tige, tɛgɛ, tige, tige

The interesting point here is the consistency of the assimilation in
Ml languages. Anticipatory assimilation takes place in Maninka and Dyula
across resonants. In 'cut', Maninka shows an extension of this process
across [g]. That this process is extending in Maninka is further illustrat-
ed. by the word 'woman'. The Proto-Ml form for this word is */muso/,
which renders [moso] in Maninka and remains [muso] in the other three lan-
guages. These correspondences, then, are not as irregular as they might
seem, but rather appear to be conditioned variants of *[i].

Of the twelve high front vowels in final position, seven are regular
correspondences and five appear to be irregular. Three of these irregu-
larities involve the replacement of [i] with [o] or [ɔ] in Xassonke. The
[o] reflex may well be a definite suffix, which is sometimes assimilated to
the preceding vowel and sometimes not. In many languages of this area,
nouns must be elicited in lists in their definite form. Consider [san-ji-o]
'rain' or [su-o] 'night' as compared with [jɛlo] 'blood' (< */jɛli/) or
[yirɔ] 'tree' (< */yiri/). Why this vowel takes the form [o] in some
instances and [ɔ] in others is not understood. Nevertheless, the words
'tree': yirɔ, yiri, yiri, yiri; 'root': lilɔ, lilin, dili, liri(n); and
'egg': sisɛ-kilo, sisɛ-kili, kili, kiri may all be reconstructed with */i/
in final position, a definite suffix disrupting the otherwise regular
correspondences. As will be demonstrated, the same form of definite suf-
fix is used in Diakhanka (cf. M2) with the same results, a strong support
for this analysis.

The other two irregularities are 'rain': san-ji-o, san-ji, san-ji, san-ye
and 'stand': wule, wuli, wuli, wuri yielding matchings of [i:i:i:e] and of
[e:i:i:i]. The reasons for these lowerings are not known, but speculation
will be made further along in the discussion in connection with another
vowel changing to [e]. The evidence from M2 points towards a tentative
*/i/ reconstruction.

Medial high-mid front vowels are not found in as frequent use in the
Swadesh list as high front vowels. Only two examples of [e:e:e:e] are
available with two irregularities in 'one': kelɛn, kelen, kelen, kɛlɛn
and 'foot': sin-ŋɔ, sen, sen, sen. The evidence from Group A and C sup-
ports */e/ for 'one' and */ɛ/ for 'foot'. There is no possibility of

reconstructing */ε/ for 'foot', however, since there is no phonetic justifi-
cation for it in M1 and */ε/ is reconstructable from a totally different
correspondence. The most reasonable conclusion is that 'foot' be re-
constructed */e/ tentatively, allowing nasalisation in a monosyllable to
explain vowel lowering in Groups A and C.

There is only one example of [e:e:e:e] in final position, but there is
another case of [o:e:e:e] in 'sun': tilo, tele, tile, tɛre. This, too,
reconstructs as */e/ disturbed in its regular correspondence by the vowel
suffix once again. This gives a little more credence to the existence of
a final */e/, these being the only two examples.

Mid-low front vowels are also sparse medially. Even the suggested
correspondences are weak. The two irregularities for this set are 'tongue':
nɛn-ŋɔ, nɛn, nɛn, nane and 'sand': kɛnɛ-kɛnyɛ-nyɔ, kinyɛ, cɛncɛn, cɛnjɛn
providing matchings of [ɛ:ɛ:ɛ:a] and [ɛ:i:ɛ:ɛ]. Support is adequate from
Group C to reconstruct */ɛ/ for 'sand'. 'Tongue' is more difficult, and
will be reconstructed */ɛ/ on the strength of number of occurrences alone.
Both are very tentative, as is the whole of the */ɛ/ reconstruction in
medial position.

The evidence is much stronger for */ɛ/ in final position. Three fine
examples are provided and another definite suffix interference in 'fish':
nyɛgo, jɛgɛ, jɛgɛ, yigɛn yielding [o:ɛ:ɛ:ɛ]. Evidence from M2 and Group C
also supports */ɛ/ for 'white': xwe, gbɛ, jɛ, gbɛ which gives [e:ɛ:ɛ:ɛ].
These may both be reconstructed */ɛ/, 'white' tentatively, and 'fish' more
assuredly.

2.2.1.2. Mid. The mid vowel [a] is extremely common in medial and final
positions, with no exceptions out of eleven examples in medial position
and only three out of sixteen finally. Of the three, two are further ex-
amples of phonetic interference with the definite suffix. 'Leaf': fitɔ,
fida, fura, fla and 'new': kutɔ, kuda, kuda, kura reconstruct with */a/.

The third irregularity is 'eye': nya, nya, nya, nyɛ . It is interesting
that [a] is raised to [ɛ] after [ny] here and [i] is lowered to [ɛ] after
[y] in the word 'rain' in the same language. In none of the other eleven
examples of [i] in final position is it preceded by another palatal glide
type consonant, nor is [a]. Could it be that Dyula likes mid front vowels

after glides? Perhaps [a] is assimilated to the palatal glide, while [i] is dissimilated so that it will not be absorbed, resulting in a phonetic merger produced by two opposing tendencies. Needless to say, this is speculation to the highest degree. Nevertheless, this may be reconstructed */a/ tentatively but strongly.

2.2.1.3. <u>Back</u>. High back vowels are prevalent medially. There are three irregularities to nine regular correspondences. As mentioned earlier, 'ear': tulo, tolo, tulo, toro and 'woman': muso, moso, muso, muso are examples of [u] assimilating to [o] in Maninka (cf. 2.2.1.2.). The word 'say': xuma, kuma, kuma, kooma alone stands as an unexplained irregularity. M2 and Group C indicate a tentative */u/ reconstruction.

Final high back vowels are abnormal in one of six cases, again an example of the definite suffix in 'dog': wulɔ, wulu, wulu, wuru . This reconstructs as */u/ with no problem.

High-mid back vowels occur six times in medial position, three of which are regular [u:o:o:o] correspondences. The final vowel in each of these cases is also reconstructed */o/. This indicates a possible dissimilation rule operating in Xassonke which changes the first of two successive occurrences of [o] to [u], such that */bolo/ 'hand' → [bulo], etc. A would be exception to this dissimilation rule is found in 'belly': kono, kɔnɔ, kɔnɔ, kɔnɔ . Welmers [personal communication] has suggested that this is a problem of transcription in the case of Xassonke. If this suggestion is not correct, then recourse must be made to another explanation for this deviance. This explanation will be presented below in connection with a problem which may be related.

In view of the [o] to [u] dissimilation rule, we have an explanation for shy 'big': bon, bon, bon, bon does not follow the general [u:o:o:o] pattern: there is no need for dissimilation. This then may be reconstructed */o/.

'Five' (lolu, loolu, duuru, looru) is interesting from two points of view. First, this is the only case of assimilation in Bambara thus far and secondly, this is a case of upward assimilation (e.g. [o] > [u]) whereas the cases of Maninka and Dyula have all been downward (e.g. [u] > [o] and [i] > [e], [ɛ]). Another way to view this same phenomenon is that all

three languages assimilate progressively, but Bambara assimilates to high vowels and Maninka and Dyula assimilate to mid. Which interpretation, if either, may be correct is difficult to say without further information. It should also be noted that all of the cases of assimilation in M1 presented in the Swadesh list are examples of assimilation within a series, e.g. a front vowel may raise or lower to assimilate, as may a back vowel, but they may not move cross-laterally from front to back or back to front. These points are far from proven, but highly suggestive, to say the least. */o/ may be tentatively reconstructed for 'five'.

'Nail' is indeed an oddity: sonin-ŋɔ, bolo-sorin, sɔnin, boro-sani . Why the [o:o:ɔ:a] matching is unknown. The support is skimpy and could be either */o/ or */ɔ/ but is reconstructed as an extremely tentative */o/.

'Bone' is also inexplicable: ----, kɔlɔ, kolo, koro . The evidence from M2 and Ligbi point towards a tentative */o/ in medial and final position.

Final [o] is less stable, four of seven cases being irregular. One example, 'bone', was discussed above.

'Meat' is also inexplicable: sutɔ, sobo, sogo, soɣo . This [ɔ:o:o:o] matching is reconstructed a tentative */o/.

'Moon', likewise, cannot be adequately explained at this point: xaro, karo, kalo, kari . Why the innovated [i] is not known. This segment should probably be reconstructed */o/.

Only 'wash' appears to have light shed on it from another group. M2 suggests that it was probably a form with the shape [kuo] or [ku-ro], which became [o] in some languages and [u] in others while some, such as Dyula [kwo], still show vestiges of the original form: ku, ko, ko, kwo .

Low-mid back vowels are consistent in medial position, only two of eleven being irregular. 'Belly' was discussed above: kono, kɔnɔ, kɔnɔ, kɔnɔ . One speculative explanation for the aberrant form [kono] in Xassonke is found in rule ordering. If we assume that the dissimilation rule ([o] → [u]/__Co) operates prior to an assimilation rule (e.g. 1. kɔnɔ-o → kono and 2. kɔno → kono), the result will be correct, and we will have an answer for why in the first place Xassonke has an [o-o] reflex of an [ɔ-ɔ] word, and secondly why it does not undergo the

dissimilation rule. Whether this is the case, or the transcription is in error, the tentative reconstruction should be */ɔ/.

'Who' is also irregular: ----, jɔn, jɔn, jon . This irregularity is not of crucial importance, since the form cannot be reconstructed past Proto-Mandekan. It may have been */o/ or */ɔ/ and */ɔ/ is selected extremely tentatively.

Final low-mid back vowels are also consistent, one irregularity appearing in nine occurrences. 'Old': xɔto, kɔrɔ, kɔrɔ, kɔrɔ shows the same [o] influence as is present in nouns. It may be that this is a citation form even in some words other than nouns, or perhaps this is the noun 'age'? Nevertheless, this is most probably */ɔ/.

2.3. <u>Proto-Ml C and V systems and word list</u>. This section serves to present an overview of the entire Proto-Ml phonological system in initial, medial and final positions. The reconstructed forms of the words from the Swadesh list will also be given.

Table 6 — <u>Proto-Ml System</u>

<u>Initial</u>

Consonants					Vowels
	*t		*k,*k'?		
*b	*d	*j		*gb	
*f	*s				
*m	*n	*ny			
	*l				
*w		*y			

<u>Medial</u>

Consonants				Vowels	
	*t	*g,*g'			
*b				*i	*u
	*s			*e?	*o
				*ɛ?	*ɔ
*m	*n			*a	
	*l,*l'?				
	*r??				

Consonants   Vowels

                                    *i   *u
                                    *e?   *o
        *n   *ɛ   *ɔ
                                        *a

Table 7 — Reconstructed Word List - Proto-Ml

1. 'name'   : *tɔgɔ   26. 'breast' : *sin   51. 'egg'   : *sisɛ-kili
2. 'one'   : *kelen   27. 'belly' : *kɔnɔ   52. 'bird'   : *kɔnɔ
3. 'two'   : *fila?   28. 'navel' : *bata   53. 'fish'   : *nyɛgɛ(n)
4. 'three' : *saba   29. 'skin'   : *gbolo?   54. 'snake'   : *sa
5. 'four'   : *naanin   30. 'bone'   : *kolo?   55. 'dog'   : *wulu
6. 'five'   : *lool'u   31. 'blood' : *joli   56. 'big'   : *bon
7. 'person' : *mɔg'ɔ   32. 'sky'   : *san-kolo   57. 'small'   : *dɔgɔ
8. 'man'   : *kɛ?   33. 'fire'   : *ta   58. 'black'   : *fin
9. 'woman' : *muso   34. 'water' : *ji   59. 'white'   : *gbɛ
10. 'child' : *den(den)   35. 'meat'   : *sobo   60. 'good'   : *nyin
11. 'father' : *fa   36. 'salt'   : *k'ɔg'ɔ   61. 'new'   : *kuta
12. 'mother' : *na?   37. 'many'   : * ?   62. 'old'   : *k'ɔtɔ
13. 'head'   : *kun   38. 'stone' : *kaba?   63. 'hot'   : *gban?
14. 'hair'   : *kun-sigi   39. 'sun'   : *tile   64. 'cold'   : *suman?
15. 'nose'   : *nun   40. 'moon'   : *k'alo   65. 'dry'   : *ja-len
16. 'eye'   : *nya   41. 'night' : *su   66. 'straight' : *tilen
17. 'ear'   : *tulo   42. 'rain'   : *san-ji   67. 'come'   : *na
18. 'mouth' : *da   43. 'smoke' : *sisi (-o) 68. 'sit'   : *sigi
19. 'tooth' : *nyin   44. 'sand'   : *kɛnyɛn??   69. 'lie'   : *la
20. 'tongue' : *nɛn(e)   45. 'rope'   : *jul'u   70. 'sleep'   : *sinɔg'ɔ
21. 'neck'   : *kan   46. 'tree'   : *yiri   71. 'die'   : *sa
22. 'hand'   : *bolo   47. 'leaf'   : *fita   72. 'fall'   : * ?
23. 'foot'   : *sen   48. 'root'   : *lili(n)   73. 'stand'   : *wuli
24. 'knee'   : *kumbel'en   49. 'milk'   : *nɔnɔ   74. 'say'   : *k'uma
25. 'nail'   : *bolo-sonin   50. 'grease' : *kɛn   75. 'hear'   : *mɛn?

76. 'wash' : *ku̲o   89. 'they' : *   ?

77. 'see' : *ye   90. 'who' : *jɔn?

78. 'give' : *di   91. 'what' : *mun

79. 'eat' : *du̲mun   92. 'not' : * tɛ

80. 'drink': *min   93. 'long' : *jan

81. 'kill' : *fag'a   94. 'short': *sutun

82. 'cut' : *ti̲gɛ   95. 'here' : *yan

83. 'hit' : *   ?   96. 'few' : *dɔɔni?

84. 'sew' : *k'al̲'a   97. 'all' : *bɛ̲ɛ̲?

85. 'I' : *nɛ̲   98. 'path' : *sil'a?

86. 'you' : *i   99. 'in' : *kɔnɔ

87. 'he' : *a   100. 'if' : *ni

88. we' : *an?

Key: ___ : underscoring reflects tentative reconstruction.

    ? : indicates that the reconstruction was from less than all four
      languages.

3. Reconstructing Mandekan - M2

M2, the second Mandekan subgroup, is composed of Bo (B), Konyanka (K), Wassulunka (W), Diakhanka (D) and Mauka (M).

3.1. M2 consonants.

Table 8 — Initial Consonants

Labials   No. of Corr.

		22. 'hand'	28. 'navel'	97. 'all'	No. of Corr.
*/b/	B:	b o	b a -ku	- -	5
	K:	b oro	b ara-kun	b ɛ	
	W:	b olo	b ara-kun	b ɛ	
	D:	b ulo	b ato-	b ɛ	
	M:	b o o	b a -gun	b a	

		7. 'person'	9. 'woman'	80. 'drink'	No. of Corr.
*/m/	B:	m ogo	m uso	m i	5
	K:	m ɔ ɔ	m uso	m in	
	W:	m ɔgɔ	m uso	m in	
	D:	m ɔxɔ	m uso	m i-	
	M:	m ɔ ɔ	m oso	m in	

	55. 'dog'	73. 'stand'	No. of Corr.
*/w/			2
B:	– uɪu	– uɪi	
K:	w uɪu	w uɪi	
W:	w uɪu	w uɪi	
D:	w uɪo	w uɪi	
M:	w u u	w i i	

Note that [w] is absorbed by the following [u] in Bo.

	3. 'two'	58. 'black'	81. 'kill'	
*/f/				5
B:	– ---	f i	– ---	
K:	f ila	f in	f a	
W:	f ila	f in	f aga	
D:	f ula	f i	f axo	
M:	f ila	f in-ni	f a a	

Dentals

	10. 'child'	78. 'give'	
*/d/			2
B:	d i	d i	
K:	d ɛn-nin	d i	
W:	d en	d i	
D:	d indin-ŋɔ	d ima-ro	
M:	d ien	d i	

	18. 'mouth'	57. 'small'	79. 'eat'	
*/d/				4
B:	d a	– ---	d u	
K:	d a	d ɔ-ya	d un	
W:	d a	d ɔgɔn	d ɔn	
D:	d a	– ---	d omo-ro	
M:	l a	l ɔɔ	l ɔ	

The [l]:[d] variation in Mauka appears to be conditioned by [i]
vs. elsewhere respectively. More evidence is needed to ascertain
whether indeed the [l] and [d] in Mauka are allophones in this
environment.

	17. 'ear'	39. 'sun'	33. 'fire'	
*/t/				4
B:	t o	t e	– –	
K:	t oro	t ɛre	t a	
W:	t olo	t ɛle	t a-suma	
D:	t ulo	t ilo	t a	
M:	t o o	t e	t a	

		49. 'milk'	67. 'come'	100. 'if'	No. of Corr.
*/n/	B:	n ono	n a	– –	5
	K:	n ɔnɔ	n a	n i	
	W:	n ɔnɔ	n a	n i	
	D:	n ɔnɔ	n a	n i	
	M:	n ɔnɔ	n a	n i	

		26. 'breast'	32. 'sky'	43. 'smoke'	
*/s/	B:	s i	s a	s isi	15
	K:	s in	s an	s isi	
	W:	s in	s an	s isi	
	D:	s in-ji-o	s an-ŋɔ	s isi-o	
	M:	s in	s an-gbo	s isi	

Resonants

		6. 'five'	69. 'lie'		
*/l/	B:	– ---	d a		2
	K:	l oru	l a		
	W:	l olu	l a		
	D:	l ulu	l a		
	M:	l oru	l a		

Whether these two examples are actually correspondences cannot be known for certain without further exemplification.

Palatals

		16. 'eye'	19. 'tooth'		
*/ny/	B:	ny a	ny i		2
	K:	ny a	ny in		
	W:	ny a	ny in		
	D:	ny a	ny in-ŋɔ		
	M:	ny a	ny in		

		34. 'water'	65. 'dry'	93. 'long'	
*/j/	B:	j e	– –	– –	3
	K:	j i	j a	j ɛ	
	W:	j i	j a-le	j an	
	D:	j i-o	j a-re	j an	
	M:	j i	j a	j an	

Velars

		21. 'neck'	36. 'salt'	40. 'moon'	
*/k/	B:	k a	k oko	k alo	16
	K:	k an	k ɔ ɔ	k alo	
	W:	k an	k ɔgɔ	k aro	
	D:	k an-ŋɔ	k ɔxɔ	k aru	
	M:	k an	k ɔ ɔ	k alo	

It should be noted here that the correspondences reconstructed as */k'/ in *M1 reconstruct perfectly as */k/ in *M2.

Lab. Vel.

		63. 'hot'		59. 'white'		83. 'hit'		No. of Corr.
*/gb/	B:	–	--	py	ὲ	by	ὲ	3
	K:	gb	an	gb	ε	gb	asi	
	W:	–	--	gb	ε	gb	εsε	
	D:	g	ando	g	ε	g	oso-ro	
	M:	gb	an	gb	a-ni	gb	asi	

Several things speak for a */gb/ reconstruction here. First,
nowhere else is [g] found initially. Secondly, the correspondence
is good for K-W-D-M and only B presents a problem with voiced [by]
vs. voiceless [py]. Thirdly, it is unlikely that a labio-velar
would develop from a velar proto-form or from a labial proto-form,
yet not so unlikely that velars and labials both would develop in-
dependently from a labio-velar ancestor. Finally, the cognates to
these words in *M1 reconstruct as */gb/, as they do also in *Group
C. A further note is that these two words are two of the only words
in the data for which tone was supplied. It should be mentioned
that the voiced:voiceless distinction is the only one differen-
tiating these two words and may therefore carry some degree of
functional load.

Table 9 — Medial Consonants

Labials   No. of Corr.

		4. 'three'			38. 'stone'			No. of Corr.
*/b/	B:	--	–	–	--	–	–	2
	K:	sa	b	a	ka	b	a	
	W:	sa	b	a	ka	b	a	
	D:	sa	b	a	--	–	–	
	M:	sa	w	a	ka	w	a	

		74. 'say'				No. of Corr.
?*/m/	B:	--	–	–		1
	K:	ku	m	a		
	W:	ku	m	a		
	D:	ku	m	ɔ		
	M:	ku	m	a		

*/m/ is reconstructed here very tentatively due to the nondeviance
of the [m] throughout the forms, and because it reconstructs nicely
as */m/ in *M1. Two other apparent irregular */m/ matchings will
be dealt with in the discussion of irregularities.

Dentals

		28. 'navel'		61. 'new'		62. 'old'		No. of Corr.
*/t/	B:	ba	– -ku	ku	r a	ko	[ ]	3
	K:	ba	r a-kun	ku	r a	kɔ	r ɔ	
	W:	ba	r a-kun	ku	r a	kɔ	r ɔ	
	D:	ba	t o	ku	t o	--	– –	
	M:	ba	– -gun	--	– –	kɔ	– ɔ-ni	

		5. 'four'		49. 'milk'		70. 'sleep'		
*/n/	B:	--	– –	no	n o	si	n ogo	5
	K:	na	n i	nɔ	n ɔ	su	n u	
	W:	na	n i	nɔ	n ɔ	su	n ɔgɔ	
	D:	na	n i	nɔ	n ɔ	si	n ɔxɔ	
	M:	na	n i	no	n ɔ	si	n ɔ ɔ-kɛ	

		9. 'woman'		43. 'smoke'		51. 'egg'		
*/s/	B:	mu	s o	si	s i	--	– – kli	3
	K:	mu	s o	si	s i	--	– – kili	
	W:	mu	s o	si	s i	si	– e-kili	
	D:	mu	s o	si	s i-o	si	s ɛ-kilɔ	
	M:	mo	s o	si	s i	si	s i-kii	

Resonants

		2. 'one'		55. 'dog'		51. 'egg'		
*/l/	B:	--	– ?	u	l u	--k	l i	10
	K:	ke	l e	wu	l u	--ki	ɬ i	
	W:	kɛ	ɬ e	wu	l u	--ki	l i	
	D:	kɛ	l ɛ	wu	l o	--ki	l ɔ	
	M:	kɛ	l ɛ	wu	– u	--ki	– i	

The [l] syncopates medially in Mauka very frequently, which is the case for all resonants. The conditioning factor for deletion does not appear to be environmental, but rather may be a freely varying ∅ allophone.

		46. 'tree'		47. 'leaf'		
?*/r/	B:	yi	r i	--- --	– –	2
	K:	ji	r i	fla -bu	r u	
	W:	yi	r i	fula-bu	r u	
	D:	yi	r o	--- --	– –	
	M:	yi	– i	fia -bo	–	

Here, too, the [r] syncopates medially in M.

Velars

		1. 'name'			7. 'person'		81. 'kill'			No. of Corr.
*/g/	B:	tɔ	g	o	mɔ	g	o	--	-	-	4
	K:	dɔ	-	ɔ	mɔ	-	ɔ	fa	-		
	W:	tɔ	g	ɔ	mɔ	g	ɔ	fa	g	a	
	D:	tɔ	x	ɔ	mɔ	x	ɔ	fa	x	o	
	M:	dɔ	-	ɔ	mɔ	-	ɔ	fa	-	a	

Mauka (as well as Konyanka) syncopates [g] medially, much as it treats resonants. In section 2.2.1.1. (p. 210) there is a discussion of how [g] and resonants are treated similarly in Maninka, in which vowel harmony occurs across both [g] and resonants.

Table 10 — Final Consonants

Dentals   No. of Corr.

		15. 'nose'			21. 'neck'			95. 'here'			No. of Corr.
*/n/	B:	nyu	-		ka	-		ya	-		15
	K:	nu	n		ka	n		ya	n		
	W:	nu	n		ka	n		ya	n		
	D:	nu	n	-ŋɔ	ka	n	-ŋɔ	ja	n		
	M:	nu	n		ka	n		ja	n		

In none of the 15 examples does Bo retain final [n]. The MSC of Bo has changed from allowing a final [n] consonant to admitting none at all.

3.1.1.   Discussion of M2 consonant irregularities. This section, as in the *M1 reconstruction, presents irregular matchings in sure cognates with arguments for tentative reconstruction of those segments involved.

3.1.1.1.   Labials. Only one irregular matching is attested in initial position which is 'father': fa, fa, fa, fa, baba . This is more than likely non-cognate and */f/ is reconstructed for four of the languages, in accordance with *M1.

Two irregularities present themselves in medial position: 'cold': ---, suman, suma, suma-re, suwa and 'eat': du, dun, dɔn, domo-ro, lɔ .

The final [n] indicated in the monosyllabic forms of 'eat' may be either a case of the transcriber signalling nasalization of final vowels with [n], or it may simply be a case of final phonetic [m] being changed to [n], Mandekan languages allowing no other consonant in final position. In any case, the segment was */m/ originally, as attested by *M1 and Hwela, from Group B. It is significant that in every case in which the present

cognate remains bisyllabic, the [m] reflex obtains and where the cognate
has been reduced to a monosyllable, final [n] is attested.

'Cold' is also clearly reconstructable with */m/ as witnessed by
*M1 and Groups A, B and C. It is interesting that the weakening here
of [m] > [w] is paralleled in the same language with a regular [b] > [w]
weakening in medial position.

3.1.1.2. Dentals. There are several irregularities in the dental series
in initial position.

Of the three matchings to be reconstructed */t/, only one has a
plausible explanation: 'straight': ---, tɛlɛ, tɛlini, tilin, latɛn-ni .
This is most probably a case of metathesis if the forms are cognate.

The two other aberrances are 'name': togo, dɔ, tɔgɔ, tɔxɔ, dɔɔ and
'not': --, tɛ, tɛ, te, dɛ . No attempted explanation is offered here.
*M1 suggests */t/ for both words, while Ligbi and Group C likewise support
this reconstruction for 'name'.

'Not' is difficult in that two negative morphemes exist in these
languages (if not more), /ma/ and /tɛ/, which are used differently. Un-
fortunately, some informants gave one form while others gave the second,
making reconstruction of one or the other less complete than might other-
wise be expected.

The */s/ series also has three aberrances in seventeen occurrences in
initial position.

'Night': syu, su, su, su, su-o is the only example of [s] before [u]
in a monosyllable, which may provide an environment for a glide. In spite
of this uncertainty, *M1 clearly suggests an */s/ reconstruction, as does
Group C.

'Many': ---, sia-ma, ca-ma, siya-ma, sia-ma should probably be re-
constructed as */s/ in *M2. *M1 is very questionable and no cognate forms
show up in any of the other groups. This, therefore, is of little im-
portance to the reconstruction. Wassulunka is undergoing a palataliza-
tion of [s] and [t] in initial position (cf. 'sand' above).

'Nail': ---, bolo-kɔnin-fara, bolo-sɔni, sɔnin, soin-va shows a
strange [s] > [k] in Konyanka. No environmental or other conditioning
factor is known. M1 provides a sure */s/, with no other cognates in
other groups.

Initial */n/ has only two irregularities in seven occurrences, both palatalizations.

'Nose': nyu, nun, nun, nun-ŋɔ, nun is interesting because it adds partial confirmation that Bo does tend to palatalize some consonants in monosyllables before [u], as suggested in the initial */s/ reconstruction for 'night' above. This is reconstructed */n/, again strongly supported by *M1.

'Tongue': ne, nɛn, nɛn, nɛn-ŋɔ, nyɛ(n) shows the same tendency in Mauka before high front vowels. In fact, 'if' appears to have free variation between [ni]:[nyi] in this language, pointing up the same palatalization process. */n/ should be reconstructed.

In medial position, */t/ presents one irregularity in four examples. 'Short': sunu, suya, suru, situ, sonta provides this interesting matching with [n:y:r:t:nt]. The [y] reflex in this matching is not understood. The *M1 reconstruction of the cognate form is a strong */sutun/, suggesting a metathesis to explain the [nt] reflex. However, this "explanation" would necessarily have to be invoked for the [n] reflex as well. On the other hand, the proto-form of *M1 may have been the result of metathesis itself: */suntu/ > */sutun/. Mauka and Bo speak for an [nt] reflex in medial position, as does Kurankɔ. Kurankɔ was probably the first language to break off from the Mandekan Group. Of the languages remaining in Mandekan, Mauka and Bo were probably the next to break off. If this is the case, the diverse cognate forms for 'short' can be reasonably accounted for: after Group C, Mauka and Bo had broken off from the rest of the core group, the proto-form underwent a metathesis */suntu/ > */sutun/. The former therefore show vestiges of [nt] medially, whereas the other languages show no such reflex. The reason for the metathesis may be found in the relative unacceptability of consonant clusters in these languages.

The reconstructed form for 'hair' is */kun-sigi/ in *M1. This is a compound of "kun-" 'head' and "sigi" 'hair'. Although the */s/ is morpheme initial, it must be treated as a medial consonant. In M2 the cognates are: kun-sye, kun-zi, kun-si, ---, kun-ze . Here, as in *M1, [s] > [z] after [n] in Konyanka and Mauka. In Bo the [s] has been palatalized by the high front vowel. It is interesting to speculate that this type of phenomenon

occasioned the [nt] contact in 'short' discussed above.

Two irregularities occur in seven examples of medial [n], both in-volving [nd] reflexes.

'Belly': ko, kɔnɔ, kɔndɔ, kɔnɔ, koo reconstructs as */n/ in *M1. There are no cognate forms in Groups A and C. The cognate forms in Group B have been shortened to monosyllables, placing the segment in final position. No segment other than [n] being allowed finally, this does not help the reconstruction a great deal. This must remain a tentative */n/, keeping the phonetic [nd] in mind.

The second example is 'few': ---, dɔɔni, dɔni, dɔndi, --- . Interest-ingly, although *M1 shows an [n] reflex, Group A, the most distantly re-lated group, shows an [nd] reflex. At this point this should remain an */n/ reconstruction, leaving */nd/ as a possibility.

Only one of sixteen occurrences of final [n] is irregular, if it is cognate: 'hear': me, mɛn, mɛn, mero, ---. The [r] in mero is unexplain-able. The reconstruction for the cognate forms in M1 is */n/. Ligbi also has [n]. There is no other evidence of [r], and it will thus be recon-structed in *M2 as */n/.

It should be noted that although there are several words which might tentatively be reconstructed with a medial [-nd-] cluster there is no evi-dence whatsoever for prenasalized stops in Northern Mande languages. The complete absence of such clusters in initial and final positions is, of course, additional testimony to this fact.

3.1.1.3. _Resonants._ There are ten regular */l/ correspondences and only one regular */r/ matching. The other examples are a seemingly odd mixture of the two. The resonants in these languages are very unstable in medial positions. The apparent randomness of the change comes to light nicely in the example of the two words 'hand' and 'nail'. In Konyanka the former is [boro] and the latter is [bolo-kɔnin], a compound of 'hand' and 'claw'. The words are from the same cognate ancestor, yet 'hand' shows [r] while [l] is manifested in 'nail'.

Many attempts have been made to uncover a possible pattern in the resonant series, and all have proven to be ad hoc solutions to a sticky problem. The only reasonable presentation at this time is to provide a

chart of the matchings with tentative suggestions made for reconstructions.
This is done below.

(4)

B	K	W	D	M	*M1			
-	r	l	l	r	*l'	6.	'five':	---, loru, lolu, lulu, loru
∅	r	l	l	∅	*l	17.	'ear' :	to, toro, tolo, tulo, too
						22.	'hand':	bo, boro, bolo, bulo, boo
						30.	'bone':	ko, koro, kolo, kulo, koo
						39.	'sun' :	te, tɛre, tɛle, tile, te
l	l	r	r	l	*l	40.	'moon':	kalo, kalo, karo, karu, kalo
r	r	l	l	∅	*l'	45.	'rope':	yuru, juru, julu, julo, juu
∅	r	l	r	∅	*l	84.	'sew' :	ka, kara, kala, kara-lo, kaa
r	r	r	l	∅	*l'	98.	'path':	sira, siran, sira, sila, sian

The [∅:r:l:l:∅] correspondence is the most striking relationship.
The */l/ > [r] change in Konyanka occurs between two [o]s in three of the
four words. It is difficult to understand, however, why 'sun' ([tɛre]) has
a phonetic [r] while 'straight' ([tɛlɛ]) has a phonetic [l] in almost iden-
tical environments. In both cases the evidence is strong that the segment
was etymologically */l/. Furthermore, words such as [golo] ('skin') and
[bolo] ('hand') rule out the possibility that [l] > [r]/ o___o diachron-
ically.

It is probably significant that Konyanka undergoes the [l] > [r]
change in eight of the nine words above. This may indicate that a phono-
logization process is taking place in this language. In eighteen ex-
amples of resonants in medial position, ten have remained [l] while eight
have changed to [r]. The environments in which this change has occurred
are so similar to the ones in which [l] has been retained that one is drawn
to the conclusion that proto */l/ is presently separated into an /l/:/r/
contrast. These two units appear to be of equally frequent occurrence
in the language. It is interesting that these words are reconstructed
strongly as */l/ in *M1, and that the only language which is irregular in
this correspondence from the regular */l/ correspondence in Konyanka, in
which there seems to be a much more widespread [l] > [r] change than in any
other language. Although this correspondence differs slightly from the
regular */l/ correspondence in the Konyanka forms, the evidence nevertheless
points to an */l/ reconstruction.

The chart also indicates that the words strongly reconstructed with */l/ in *M1 appear as the [∅:r:l:l:∅] correspondence in M2, only Konyanka disturbing the otherwise regular */l/ correspondence. The other words presented in the chart are inconsistent matchings in M2 and it is indicated that this same instability is shared by the cognate forms for these words in M1, as illustrated by the subscript. That is, the forms which were irregular in their [l] ~ [r] variations between languages in M1 continue their inconsistent patterning in M2 languages. The forms which were stable in M1 remain relatively stable in M2, Konyanka notwithstanding.

The [r] in Diakhanka [kara-lo] ('sew') may reflect a dissimilation with the morpheme-initial [l].

The occurrence of [r] in Bo [yuru] ('rope') and [sira] ('path') may not be as irregular as appears at first blush. Resonant deletion occurs in all other examples in Bo with the exception of 'moon'. There are five examples of deletion and three of retention, the environments for retention being quite different from the environments for deletion. Loosely, the rule is to delete resonants between non-high like vowels. That the vowels were originally identical rather than becoming identical due to assimilation after C deletion is suggested by the fact that most of the other languages retaining the medial C attest to identical vowels in words retaining the C in Bo. The same rule holds true in Bo for all examples of resonant deletion and retention attested in the data. Due to the consonant deletion it is impossible to tell which resonant was present in each case. If [r] is assumed to be the phonetic shape in Bo of 'ear', 'hand', 'bone', and 'sun' then the patterning is identical to 'rope': [r:r:l:l:∅].

This is the extent of the generalizations which can be made about resonants in M2 at present. The corroborative evidence for tentative reconstruction of these forms is found in the *M1 reconstruction. The items reconstructed */l'/ in *M1 have no consistent relationship in M2, lending more weight to the possibility that those forms falling together in the */l'/ correspondence were in fact cases of accidental convergence. These, then, will tentatively be reconstructed as */l/ in *M2.

3.1.1.4. <u>Palatals</u>. Like the resonants, the palatal changes are complex in these languages. A chart is provided for these matchings and correspondences.

The *M1 reconstruction is provided for comparison, as in the resonant chart.

(5) <u>B</u> <u>K</u> <u>W</u> <u>D</u> <u>M</u> <u>*M1</u>

(j)	j	j	j	j	*j	34.	'water': je, ji, ji, ji-o, ji
						65.	'dry' : --, ja, ja-le, ja-re, ja
						93.	'long' : --, jɛ, jan, jan, jan
y	j	j	j	j	*j	45.	'rope' : yuru, juru, julu, julo, juu
y	j	j	y	y	*j	31.	'blood': yu, jɛli, jɛli, yɛlo, ye
y	j	y	y	y	*y	46.	'tree' : yiri, jiri, yiri, yiro, yii
j	y	y	j	y	*y	77.	'see' : je, ye, ye, je-ro, ye
y	y	y	j	j	*<u>y</u>	95.	'here' : ya, yan, yan, jan, jan

All reconstructions for *M1 are solid reconstructions with the exception of 'here', which shows three occurrences of [y] to one of [j].

Bo appears to allow [j] only in monosyllables with high front vowels such as in 'water', and changes an etymologic /y/ to [j] in a similar environment in 'see'. Elsewhere */j/ and */y/ merge to [y].

Wassulunka makes no changes in the reconstructed forms predicted by *M1 and Konyanka changes only [y] to [j] in the word for 'tree'. In Bambara, the same word allows free variation between [yiri] and [jiri] in some dialects.

If the *M1 reconstructions are correct for *Mandekan, then Diakhanka and Mauka aberrances are difficult to explain with any generality. However, this is the case for some languages no matter what the reconstruction. With the reconstruction as it is only two of the nine languages reveal unexplainable irregularities and these in only one and two words respectively. Both Diakhanka and Mauka change */j/ to [y] in 'blood' for no apparent reason, while Diakhanka changes */y/ to [j] in 'see'.

'Fish': yige, jɛɛ, nyɛgɛ, yɛgo, yɛɛ is reconstructed */ny/ for the same reasons offered in the *M1 reconstruction. The Wassulunka form lends further confirmation to this reconstruction.

'Good': dyi, nyi, nyi, ---, nyi has only one exception in [dyi]. The evidence from M1 and the rest of M2 is strong for */ny/.

The problem in reconstructing palatals in *M2 is the apparent randomness of change within the series, along with the general lack of insight

offered by the other groups of languages under study. Often complex general changes give the impression of randomness when the data is insufficient. It should be constantly remembered in a reconstruction from a one hundred word list that this problem will present itself in most instances where complex changes have obtained. This does not mean that the reconstruction, being tentative for various segments, is therefore useless. Rather, it tends to illuminate problem areas for further in-depth research.

Medial position shows what appears to be an example of a palatal [-ny-] in the word 'sand': tye, tinyɛ, cɛn, kɛnyɔ, cɛn . The same word shows [-ny-] in Ml languages. This should be considered a cluster, however, and not a palatal phoneme. As in the cases of [-mb-] and [-nd-] clusters discussed previously, [-ny-] is most likely the result of final [n] and initial [j] or [y] of two separate words which were in compound relation at a former point in time (or perhaps still at present). The fact that there are no other palatal consonants which may occur in medial position strongly suggests such an analysis.

3.1.1.5. Velars Only three of nineteen examples of velars in initial position are irregular.

'Man': ce, cɛ, cɛ, kɛ, cɛ . Although the segment is widely manifest as a palatal affricate, evidence is strong that it derives from [k] with a palatalization change as suggested in the *Ml reconstruction. The segment is tentatively reconstructed */k/.

'Sand': ce, tinyɛ, cɛn, kɛnyɔ, cɛn differs from 'man' only in [tinyɛ] and will also be tentatively reconstructed as */k/ on evidence from Group C.

'Grease': ke, cɛ, --, --, cɛ is another example of the same palatalization process.

Of five medial examples, only one is slightly irregular. 'Salt': koko, kɔɔ, kɔgɔ, kɔxɔ, kɔɔ shows a medial [k] in Bo, rather than [g]. This may be a case of assimilation, assisted by both the phonetic similarity of the velars and of the syllables themselves. The reconstruction is a tentative but firm */g/.

3.1.1.6. <u>Labio-velars</u>. Only one irregularity occurs in four examples of labio-velars in initial position, that being 'skin': wo, golo, golo, wulo, gboo . The one noticeably different environment is the high back vowel. Whatever the reason for the change, the original form was undoubtedly labio-velar and is attested in M1 and Groups B and C.

3.2. <u>M2 vowels</u>. As in M1, there are no initial vowels per se in M2 languages.

Table 11 — <u>Medial Vowels</u>

<u>Front</u>   <u>No. of Corr.</u>

		19. 'tooth'	43. 'smoke'	46. 'tree'	
*/i/	B:	ny | i |	s | i | si	y | i | ri	10
	K:	ny | i | n	s | i | si	j | i | ri	
	W:	ny | i | n	s | i | si	y | i | ri	
	D:	ny | i | n-ŋɔ	s | i | si-o	y | i | ro	
	M:	ny | i | n	s | i | si	y | i | i	

*/e/   The mid vowels in M2, as in M1, are a messy problem. There is a
*/ɛ/   seemingly random variation in this word list with no recursive pattern, resulting with unique matchings for each word and no correspondences. A further problem lies in the fact that many of these vowels occur in words which historically had a final C which has since been lost, placing the V in final position presently: ---, kele, kɛle, kɛlɛ, kɛlɛ < /*kelen/ . It should be kept in mind that although */n/ has been lost, it may have had an effect on the vowels which have been retained in some languages while being erased in others. These matchings will be discussed in the section on irregularities.

<u>Mid</u>

		4. 'three'	40. 'moon'	84. 'sow'	
*/a/	B:	- | - | --	k | a | lo	k | a |	11
	K:	s | a | ba	k | a | lo	k | a | ra	
	W:	s | a | ba	k | a | ro	k | a | la	
	D:	s | a | ba	k | a | ru	k | a | ra-lo	
	M:	s | a | wa	k | a | lo	k | a | -a	

<u>Back</u>

		13. 'head'	45. 'rope'	55. 'dog'	
*/u/	B:	k | u | ngo	y | u | ru	- | u | lu	9
	K:	k | u | n	j | u | ru	w | u | lu	
	W:	k | u | n	j | u | lu	w | u | lu	
	D:	k | u | n-ŋɔ	j | u | lo	w | u | lo	
	M:	k | u | n	j | u | u	w | u | u	

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		6. 'five'			22. 'hand'			30. 'bone'			No. of Corr.
*/o/	B:	-	-	--	b	o		k	o		5
	K:	l	o	ru	b	o	ro	k	o	ro	
	W:	l	o	lu	b	o	lo	k	o	lo	
	D:	l	u	lu	b	u	lo	k	u	lo	
	M:	l	o	ru	b	o	o	k	o	o	

The [u] reflex of */o/ in Diakhanka may be explained by the [l]
environment. Only one example of the six does not have medial
[l]: 'meat': sogo, so, sogo, subo, soo . Here it may be the case
that [subo] is non-cognate with the other forms, but this is only
speculation.

		1. 'name'			7. 'person'			49. 'milk'			No. of Corr.
*/ɔ/	B:	t	o	go	m	o	go	n	o	no	8
	K:	d	ɔ		m	ɔ	ɔ	n	ɔ	nɔ	
	W:	t	ɔ	gɔ	m	ɔ	gɔ	n	ɔ	nɔ	
	D:	t	ɔ	xɔ	m	ɔ	xɔ	n	ɔ	nɔ	
	M:	d	ɔ	ɔ	m	ɔ	ɔ	n	ɔ	nɔ	

Bo, it appears, does not permit [ɔ] in medial position.

Table 12 — Final Vowels

Front   No. of Corr.

		5. 'four'		43. 'smoke'			73. 'stand'		No. of Corr.
*/i/	B:	---	-	sis	i		-ul	i	7
	K:	nan	i	sis	i		wul	i	
	W:	nan	i	sis	i		wul	i	
	D:	nan	i	sis	i	-o	wul	i	
	M:	nan	i	sis	i		wi	i	

		85. 'I'		39. 'sun'			77. 'see'		No. of Corr.
?*/e/	B:	-	-	t	e		j	e	4
	K:	n	e	tɛr	e		y	e	
	W:	n	e	tɛl	e		y	e	
	D:	n		til	e	o	j	e	-ro
	M:	n	e	t	e		y	e	

The */e/ examples are correspondences by virtue of the fact that the
[o] in Diakhanka [tilo] is the same as in Diakhanka [sisi-o] above,
i.e. some type of suffix which sometimes absorbs the preceding
vowel. The reason for ascertaining [e] of [te] in final position in
Bo and Diakhanka is that most of these languages appear to assimilate
across resonants first, and then drop the resonant, leaving a
homophonous succession of vowels.

		8. 'man'		82. 'cut'		50. 'grease'		No. of Corr.
?*/ɛ/	B:	c	e	---	-	k	e	3
	K:	c	ɛ	tɛ	ɛ	c	ɛ	
	W:	c	ɛ	tɛg	ɛ	-	-	
	D:	k	ɛ	---	-	-	-	
	M:	c	ɛ	tɛ	ɛ	c	ɛ	

Mid

		16. 'eye'		18. 'mouth'		3. 'two'		
*/a/	B:	ny	a	d	a	---	-	16
	K:	ny	a	d	a	fil	a	
	W:	ny	a	d	a	fil	a	
	D:	ny	a	d	a	ful	a	
	M:	ny	a	l	a	fil	a	

Back

		6. 'five'		41. 'night'		55. 'dog'		
*/u/	B:	---	-	sy	u	-ul	u	5
	K:	lor	u	s	u	wul	u	
	W:	lol	u	s	u	wul	u	
	D:	lul	u	s	u	wul	- o	
	M:	lor	u	s	u -o	wul	u	

There are five examples of this correspondence, two of which have this /-o/ suffix in Diakhanka.

		9. 'woman'		17. 'ear'		30. 'bone'		
*/o/	B:	mus	o	t	o	k	o	6
	K:	mus	o	tor	o	kor	o	
	W:	mus	o	tol	o	kol	o	
	D:	mus	o	tul	o	kul	o	
	M:	mus	o	to	o	ko	o	

Bo's final vowel in 17 and 30 actually corresponds to both the medial and final vowels of the other languages (as exemplified in Mauka), and was either shortened after resonant syncopation or the transcriber may have failed to hear length.

		1. 'name'		7. 'person'		49. 'milk'		
*/ɔ/	B:	tog	o	mog	o	non	o	7
	K:	d	ɔ	mɔ	ɔ	nɔn	ɔ	
	W:	tɔg	ɔ	mɔg	ɔ	nɔn	ɔ	
	D:	tɔx	ɔ	mɔx	ɔ	nɔn	ɔ	
	M:	dɔ	ɔ	mɔ	ɔ	nɔn	ɔ	

As is clear from these examples and those for */ɔ/ in medial position, Bo has merged proto */o/ and */ɔ/ into /o/.

3.2.1. <u>M2 vowel irregularities</u>. Many of the vowel irregularities in this section are unsolved problems, as is the case with M1 languages. The following presentation is meant to be as brief as possible.

3.2.1.1. <u>Front</u>. There are four exceptions in fourteen examples of high front vowels in medial position:

(6)   'two' : ---, fila, fila, fula, fila
       'leaf' : ---, fla-buru, fula-buru, ---, fia
       'sleep': sinogo, sunu, sunɔgɔ, sinɔxɔ, sinɔɔ-kɛ
       'you' : -, e, i, i, e

In 'leaf', the [i] > [u] change is probably due to the [l] environment. In Diakhanka there are six examples of V > [u] / __[l]. Arguments for an */i/ reconstruction for 'leaf', 'two', and 'sleep' are put forth in the *M1 reconstruction and they apply here as well.

The lowering of [i] to [e] in 'you' cannot be adequately dealt with since only one example exists. *M1 strongly suggests */i/ as do Groups A and C.

As aforementioned, the mid front vowels present problems. The only three words which appear to correspond are:

(7)   'tongue': ne, nɛn, nɛn, nɛn-ŋɔ, nyɛ(n)
       'hear' : me, mɛn, mɛn, mɛro, ---
       'cut'   : ---, tɛgɛ, tɛgɛ, ---, tɛɛ

These should be reconstructed */ɛ/. A few examples differ slightly from the above:

(8)   'fish': yige, jɛɛ, nyɛgɛ, yɛgo, yɛɛ
       'foot': sen-, sɛn, sɛn, sin-ŋɔ, sɛ(n)
       'sand': tye, tinyɛ, cɛn, kɛnyɔ, cɛn

All of the above examples involve a [ɛ] > [i] change, two of the three in palatal environments, shedding some light on the matter. All should be reconstructed tentatively as */ɛ/. The reconstructions for 'fish' and 'sand' are supported by *M1. Though 'foot' is tentatively reconstructed */e/ in *M1, the evidence from Groups A and C support the */ɛ/ suggestion. There are reflexes of [i], [e] and [ɛ] throughout Mandekan languages for 'foot'. */ɛ/ is chosen only because it is best supported by all groups.

The problem for 'one': ---, kele, kɛle, kɛlɛ, kɛlɛ is one of an [e] reflex in Konyanka. Although the majority of the M2 languages signal an */ɛ/

reconstruction, *M1 as well as Groups A and C support an */e/ reconstruction, Kurankɔ being the one exception. The proto-form was probably */ɛ/ with subsequent lowering in M2.

'Child': di, dɛn-ma, den, dindin-ŋɔ, diɛn poses problems with variations between high and mid front vowels. The body of the data points equally to both possibilities. *M1 shows an */e/ reconstruction. The other groups, however, are mixed equally. Group C attests to */e/. Group B shows two languages with [e] and one with [i]. Group A reconstructs with */i/. Without further evidence, the most reasonable approach appears to be to infer vowel lowering in prenasal position and reconstruct a proto */i/. The word 'child' is one word which is cognate through all the languages under study, indicating that it is a form of long ancestry in N. Mande. The attrition attested in vowel lowering, therefore, may have occurred in this form over time, whereas younger forms may not have undergone the same change.

The following words all have unique matchings with no apparent explanations:

(9)   'blood': yu, jɛli, jɛli, yɛlo, ye
        'sun' : te, tɛre, tɛle, tilo, te
        'fall' : --, pe, bi, --, bi

*/ɛ/ is a reasonable reconstruction for 'blood' with *M1 as support.

Although the patterning of M1 languages appears to support an */i/ reconstruction for 'sun', the same does not hold true for *M2 (cf. p. 339). The tentative "explanation" offered in M1 of vowel assimilation is a very general process throughout N. Mande. However, Groups B and C firmly suggest an */ɛ/ or */e/ reconstruction, unless the assimilation process occurred in most of these languages after their separation. Neither of these possibilities should be ruled out. The *M2 form should be reconstructed as */ɛ/ very tentatively, having taken all the evidence into consideration.

The forms for 'fall' are probably cognate. A choice of */e/ or */i/ as the proto-vowel again is extremely difficult. In M1 the proto-form was not reconstructed due to the diversity of its phonetic representation in

the different languages: bɔye, be, bin, be . From the M2 evidence it is fairly clear that the be forms are cognate. The other forms, however, are extremely suspicious. The sure cognates from both corpuses are: (M1) be, be (M2) pe, bi, bi . The cognate forms in Group C are: ---, bia, b̂ela, and from Group A: bira, --- . In view of this evidence, the vowel chosen will be */i/ since it appears to be the most widespread throughout the languages. Again, the reconstruction is tentative.

'Straight': ---, tɛlɛ, tɛlini, tilin, latɛn-ni is probably a case of metathesis in the final form. The other three forms make the consonant structure clear, but the vowel structure again is guesswork. The two vowels in the proto-form were probably different high front vowels, with assimilation leveling the difference in languages such as Konyanka and Diakhanka. *M1 speaks for a */tilen/ reconstruction, whereas W above and Kurankɔ from Group C speak for */tɛlinin/. Which is the correct reconstruction is impossible to say, and both will be entered as possible reconstructions, one in *M1 and one in *M2.

Seven words have straight [i] correspondences in M2 in final position. Three words have an [o] reflex in Diakhanka, found in many cognate forms just as was seen in M1. These may be reconstructed */i/.

The other four irregularities concerning high front vowels in final position are: 'water': je, ji, ji, ji-o, ji ; 'hair': kun-sye, kun-zi, kun-si, ---, kun-ze; 'rain': ---, san-ji, ---, san-ji-o, san-ge, and 'hit': ---, gbasi, gbɛsɛ, goso-ro, gbasi .

'Water' and 'rain' are from the same word */ji/ and are clearly cases of vowel lowering. The same should be said for the other two words. *M1 clearly supports this reconstruction for both words, and Group C adds confirmation for 'hit'. The /-o/ suffix is seen again in 'water' and 'hit', assimilating in the one and not the other.

The high-mid front vowels are consistent in four cases in M2, the only irregularity being 'one': ---, kele, kɛle, kɛlɛ, kɛlɛ . The consensus of the languages with this cognate form is for an */e/ reconstruction for final position.

There are two exceptions in five occurrences of low-mid front vowels in final position: 'fish': yige, jɛɛ, nyɛgɛ, yɛgo, yɛɛ and 'not': --, tɛ, tɛ,

te, dɛ . The support for an */ɛ/ reconstruction for 'fish' is given
strongly in M1 and Group A. It is evenly divided between */ɛ/ and */e/
in Groups B and C. The choice is a tentative */ɛ/.

The cognate forms in M1 also suggest an */ɛ/ reconstruction for 'not'.
3.2.1.2. Mid. In medial position there is only one aberrance in twelve
occurrences of [a]: 'hit': ---, gbasi, gbɛsɛ, goso-ro, gbasi . This
vowel is reconstructed as */a/ on very skimpy evidence. There is only
one example of it in M1, and two of three forms confirm it in Group C,
the other supporting */ɛ/. The fact that the latter language in Group C
is Kurankɔ, much more closely related to the Mandekan Group than the other
two languages, suggests a shared change in Kurankɔ and the core of Mandekan
not undergone in Group C. The [o] reflex in Diakhanka may again be the
suffix absorbing the final vowel followed by assimilation across [s].

The mid vowel is extremely stable in final position in M2 as it is in
M1. Only four of twenty examples are irregular, and those deviate only
slightly. All of these irregularities involve the /-o/ replacement of
final [a] in Diakhanka. These reconstructions are strongly */a/. The
curious circumstance here is that this suffix appears in the verbs 'kill'
and 'say'. It may be that the /-o/ suffix is a citation form for many kinds
of words, or it may be that the informant supplied the nominal forms of
these verbals to the investigator. The question cannot be answered here.
3.2.1.3. Back. The high back vowels in medial position are relatively
consistent. There are only four exceptions in thirteen occurrences.

'Stand': uli, wuli, wuli, wuli, wii shows a [u] to [i] assimilation.

'What': ---, mun, mun, mun, min shows the same apparent change as
'stand' in a completely different environment. This may be a confusion of
'what' with 'which', a relative pronoun in languages such as Bambara which
phonetically are identical to the Mauka elicitation in these data. If
this is not the case, then there is no explanation offered. All of the
groups suggest a */u/ reconstruction.

'Eat': du, dun, dɔn, domo-ro, --- is problematic. When compared with
M1, there is a strong prejudice to opt for a */u/ reconstruction with
vowel lowering to explain the [ɔ] and [o] reflexes above. However,

Kurankɔ also shows an [ɔ] reflex, as do the rest of Groups A and C.
This suggests an */o/ to [u] change after the Mandekan Group split from
Group C and possibly after Kurankɔ separated from the core of Mandekan.
Nevertheless, a couple of the languages in Mandekan have retained the */o/.
Interesting to note also is that it is Diakhanka, one of the [ɔ] retaining
languages which shows vestiges of bisyllabicity not shown in the other
languages of M2. Ml also retains bisyllabic forms in three of the four
languages, all pointing up an */m/ nasal.

'Ear': to, toro, tolo, tulo, too appears to fit well into the pattern
of the */o/ correspondence with [o:o:o:u:o]. There is evidence, however,
that it in fact should be reconstructed as */u/. Ml languages are divided,
two suggesting */o/ and two suggesting */u/. Group C also shows an [ɔ]
reflex. On the other hand, Groups A and B show a [u] reflex. It is much
more probable in these languages for [u] to assimilate across [l] to the
final [o] than to assume some type of [o] raising to [u], Diakhanka not-
withstanding. Furthermore, it is more likely to assume that Group C
changed in accordance with some of the Mandekan languages to which it is
closely related, than to assume Groups A and B changed in accordance with
the other Mandekan languages to which they are more distantly related.
The support lends itself more probably to a */u/ reconstruction with a
widespread assimilation process in Mandekan to explain the [o] reflex.
If this is the case, then the Diakhanka [u] either did not change because
of its environment, or it changed to [o] and then later changed back to
[u] because of the [o] to [u] vowel change current in Diakhanka in this
environment.

The last high back vowel exception concerns what must be a recent suffix
in 'leaf': ---, fla-buru, fula-buru, ---, fia-bo . This suffix form is
only shared by Dyula in Ml and is therefore not of great importance to the
overall reconstruction. The vowel was most likely a final */u/.

There are no aberrances in five examples of final high back vowels.

Only three occurrences of high mid back vowels are deviant.

'Moon': kalo, kalo, karo, karu, kalo shows an [o] to [u] change in
final position. Little insight can be offered here, except that this is

the only example in the data in which the vowel [u] follows [a]. */o/ is indicated as the proto-segment in *M1 and Group C.

'Big': bu, buyə, ɓo, bon, bo is a case of questionable cognation. If the first two words are cognate with the last three, the [o] to [u] change is not understood. The last three words correspond nicely with M1 and Groups A and B. In the absence of further evidence, 'big' will be reconstructed on the basis of the last three languages alone with */o/.

'Nail': ---, bolo-konin-fara, bolo-soni, sonin-ŋɔ, soin-va is an extremely tentative */o/ reconstruction, as in *M1.

There are three exceptions to the */ɔ/ correspondence in medial position in twelve occurrences.

'Belly': ko, konɔ, kondɔn, kɔnɔ, koo was tentatively reconstructed */ɔ/ in *M1, with one reflex of [o] and three of [ɔ]. Studying the other groups is not much help, since Group B, the only group with cognate forms, shows both reflexes also. S.W. Mande shows a [ko] cognate form, however, suggesting the vowel may have been [o] with lowering in nasal environments throughout these languages. The reconstruction will be a tentative */o/ for that reason.

'Bird': ko, konɔ, ---, kɔnɔ, koon reconstructs strongly as */ɔ/ in *M1. The support from the other languages under study is scattered. A tentative */ɔ/ is reconstructed in *M2.

'Sleep': sinogo, sunu, sunɔgɔ, sinɔxɔ, sinɔɔ-kɛ reconstructs as */ɔ/ in *M1. Here, too, it is tentatively reconstructed */ɔ/.

One exception exists in eight examples of low mid back vowels in final position: 'belly': ko, kɔnɔ, kɔndɔn, kɔnɔ, koo. If in fact this final vowel was [ɔ] and the medial vowel was the same, then it is difficult to know which vowel changed and which was assimilated subsequently. The reconstruction is guesswork at best, with the possibility of both vowels having been either [o] or [ɔ]. Choosing the former would necessarily imply more widespread change. The latter will tentatively be assumed with a subsequent change of the vowel in monosyllables.

Table 13 — <u>Proto-M2 System</u>

<u>Initial</u>

<u>Consonants</u>   <u>Vowels</u>

  *t   *k

*b   *d   *j   *gb

*f   *s

*m   *n   *ny

          *l

*w   *(ɣy)

<u>Medial</u>

<u>Consonants</u>   <u>Vowels</u>

  *t

*b   *g   *i   *u

    *s   *e?   *o

*m?   *n   *ɛ?   *ɔ

    *l   *a

    *r?

<u>Final</u>

<u>Consonants</u>   <u>Vowels</u>

                                      *i   *u

                                      *e   *o

                                      *ɛ   *ɔ

    *n   *a

Table 14 — <u>Reconstructed Word List - Proto-M2</u>

1.	'name'	: *tɔgɔ	8.	'man'	: *kɛ	15.	'nose'	: *nun
2.	'one'	: *kele	9.	'woman'	: *muso	16.	'eye'	: *nya
3.	'two'	: *fila	10.	'child'	: *din	17.	'ear'	: *tulo
4.	'three'	: *saba	11.	'father'	: *fa?	18.	'mouth'	: *da
5.	'four'	: *nani	12.	'mother'	: *ma?	19.	'tooth'	: *nyin
6.	'five'	: *lolu	13.	'head'	: *kun	20.	'tongue'	: *nɛn
7.	'person'	: *mɔgɔ	14.	'hair'	: *kun-si( )	21.	'neck'	: *kan

22. 'hand'   : *bolo
23. 'foot'   : *sɛn
24. 'knee'   : ?
25. 'nail'   : *bolo-sonin
26. 'breast'   : *sin
27. 'belly'   : *kon(d)o
28. 'navel'   : *bata-kun
29. 'skin'   : *gbolo
30. 'bone'   : *kolo
31. 'blood'   : *jɛli
32. 'sky'   : *san
33. 'fire'   : *ta
34. 'water'   : *ji
35. 'meat'   : *sogo
36. 'salt'   : *kɔgɔ
37. 'many'   : *sia-ma
38. 'stone'   : *kaba
39. 'sun'   : *tɛle
40. 'moon'   : *kalo
41. 'night'   : *su
42. 'rain'   : *san-ji
43. 'smoke'   : *sisi
44. 'sand'   : *kɛnyɛ
45. 'rope'   : *julu
46. 'tree'   : *yiri
47. 'leaf'   : *fila

48. 'root'   : *lili?
49. 'milk'   : *nɔnɔ
50. 'grease'   : *kɛ *tulu?
51. 'egg'   : *kili
52. 'bird'   : *kɔnɔ
53. 'fish'   : *nyɛge
54. 'snake'   : *sa
55. 'dog'   : *wulu
56. 'big'   : *bon?
57. 'small'   : *dɔgɔ(n)?
58. 'black'   : *fin
59. 'white'   : *gbɛ
60. 'good'   : *nyɨ
61. 'new'   : *kuta
62. 'old'   : *kɔtɔ
63. 'hot'   : *gban(do)
64. 'cold'   : *suma(n)
65. 'dry'   : *ja-le?
66. 'straight' : *tɛlini
67. 'come'   : *na
68. 'sit'   : *sigi
69. 'lie'   : *la
70. 'sleep'   : *sinɔgɔ
71. 'die'   : *sa?
72. 'fall'   : *bi
73. 'stand'   : *wuli

74. 'say'   : *kuma
75. 'hear'   : *mɛn
76. 'wash'   : *k(w)o
77. 'see'   : *ye
78. 'give'   : *di
79. 'eat'   : *domo
80. 'drink'   : *min
81. 'kill'   : *faga
82. 'cut'   : *tɛgɛ
83. 'hit'   : *gbasi
84. 'sew'   : *kala
85. 'I'   : *ne
86. 'you'   : *i
87. 'he'   : *a
88. 'we'   : *an?
89. 'they'   : *a(n)?
90. 'who'   : *jon
91. 'what'   : *mun
92. 'not'   : *tɛ
93. 'long'   : *jan
94. 'short'   : *suntu?
95. 'here'   : *yan
96. 'few'   : *dɔn(d)i
97. 'all'   : *bɛ
98. 'path'   : *sila
99. 'in'   : *kɔnɔ
100. 'if'   : *ni

Key: ___: underscoring reflects tentative reconstruction of a segment.

( ): indicates uncertainty of a reconstructed segment having existed.

? : indicates that the reconstruction was from less than all four languages.

4. Reconstructing Proto-Mandekan

Proto-Mandekan will be reconstructed using *M1 and *M2 cognates.

4.1. Mandekan consonants.

Table 15 — Initial Consonants

Labials				No. of Corr.

		22. 'hand'	28. 'navel'	56. 'big'	
*/b/	*M1:	b olo	b ata	b on	4
	*M2:	b olo	b ata-kun	b on?	
		7. 'person'	9. 'woman'	75. 'hear'	
*/m/	*M1:	m ɔgᵓɔ	m uso	m ɛn?	7
	*M2:	m ɔgɔ	m uso	m ɛn	
		55. 'dog'	73. 'stand'		
*/w/	*M1:	w ulu	w uli		2
	*M2:	w ulu	w uli		
		3. 'two'	11. 'father'	58. 'black'	
*/f/	*M1:	f ila	f a	f in	5
	*M2:	f ila	f a?	f in	

Dentals

		10. 'child'	78. 'give'	18. 'mouth'	
*/d/	*M1:	d en	d i	d a	5
	*M2:	d in	d i	d a	
		17. 'ear'	39. 'sun'	33. 'fire'	
*/t/	*M1:	t ulo	t ile	t a	7
	*M2:	t ulo	t ɛle	t a	
		49. 'milk'	67. 'come'	15. 'nose'	
*/n/	*M1:	n ɔnɔ	n a	n un	7
	*M2:	n ɔnɔ	n a	n un	
		4. 'three'	23. 'foot'	26. 'skin'	
*/s/	*M1:	s aba	s ɛn	s in	16
	*M2:	s aba	s ɛn	s in	

Resonants

		6. 'five'	69. 'lie'	48. 'root'	
*/l/	*M1:	l ool'u	l a	l ili	4
	*M2:	l olu	l a	l ili	

Palatals   No. of Corr.

		34. 'water'	45. 'rope'	65. 'dry'	
*/j/	*M1:	[j] i	[j] uu	[j] a-len	4
	*M2:	[j] i	[j] ulu	[j] a-le	

		16. 'eye'	19. 'tooth'	60. 'good'	
*/ny/	*M1:	[ny] a	[ny] in	[ny] in	4
	*M2:	[ny] a	[ny] in	[ny] i	

		46. 'tree'	77. 'see'	95. 'here'	
*/y/	*M1:	[y] iri	[y] e	[y] an	3
	*M2:	[y] iri	[y] e	[y] an	

Velars

		13. 'head'	30. 'bone'	36. 'salt'	
*/k/	*M1:	[k] un	[k] olo	[k'] ɔg'ɔ	17
	*M2:	[k] un	[k] olo	[k] ɔgɔ	

The [k:k] correspondences and the [k':k] correspondences do not
differ in their environments and appear to both be etymologically
reconstructed */k/ in Proto-Mandekan. The Xassonke [x] reflex in
M1 appears to be some type of random variant.

Labio-velars

		63. 'hot'	59. 'white'	83. 'hit'	
*/gb/	*M1:	[gb] an?	[gb] ɛ	[gb] ?	3
	*M2:	[gb] an(d)o	[gb] ɛ	[gb] asi	

Table 16 — Medial Consonants

Labials   No. of Corr.

		4. 'three'	38. 'stone'		
*/b/	*M1:	sa [b] a	ka [b] a		2
	*M2:	sa [b] a	ka [b] a		

		64. 'cold'	74. 'say'	79. 'eat'	
*/m/	*M1:	su [m] an	k'u [m] a	du [m] un	3
	*M2:	su [m] an	k u [m] a	do [m] o	

Dentals

		28. 'navel'	61. 'new'	62. 'old'	
*/t/	*M1:	ba [t] a	ku [t] a	k'ɔ [t] ɔ	3
	*M2:	ba [t] a-kun	ku [t] a	kɔ [t] ɔ	

		5. 'four'	49. 'milk'	70. 'sleep'	No. of Corr.
*/n/	*M1:	naa [n] in	nɔ [n] ɔ	si [n] ɔg'ɔ	7
	*M2:	na [n] i	nɔ [n] ɔ	si [n] ɔgɔ	

		9. 'woman'	43. 'smoke'		No. of Corr.
*/s/	*M1:	mu [s] o	si [s] i		2
	*M2:	mu [s] o	si [s] i		

Resonants

		2. 'one'	3. 'two'	22. 'hand'	
*/l/	*M1:	ke [l] en	fi [l] a	bo [l] o	14
	*M2:	ke [l] e	fi [l] a	bo [l] o	

		46. 'tree'	47. 'leaf'		
?*/r/	*M1:	yi [r] i	---- -- [-] -		2
	*M2:	yi [r] i	fila-bu [r] u		

Velars

		1. 'name'	53. 'fish'	57. 'small'	
*/g/	*M1:	tɔ [g] ɔ	nyɛ [g] ɛ	dɔ [g] ɔ	8
	*M2:	tɔ [g] ɔ	nyɛ [g] ɛ	dɔ [g] ɔ(n)	

Table 17 — Final Consonants

Dental

		10. 'child'	15. 'nose'	23. 'foot'	No. of Corr.
*/n/	*M1:	de [n]	nu [n]	sɛ [n]	22
	*M2:	di [n]	nu [n]	sɛ [n]	

4.1.1. <u>Discussion of Mandekan consonant irregularities</u>. Many of the irregularities which would have normally obtained have been leveled by the reconstruction methods used in this paper. Since irregular matchings are submitted to comparison with other language groups, the tentatively reconstructed forms tend to be much more homogeneous at the level where *M1 and *M2 are stirred together to reconstruct Proto-Mandekan.

4.1.1.1. <u>Labials</u>. Only one inconsistency exists in the labial series in any position. 'Mother': *na, *ma shows an [n:m] matching in initial position. It is most probable that these forms are not cognate. In fact, three forms seem to vary throughout the Mandekan languages: [ma], [na] and [ba]. These may be but are probably not cognate.

4.1.1.2. <u>Dentals</u>. 'Short': *sutun, *suntu is the only inconsistent dental matching. As argued in section 3.1.1.2., the best tentative guess is that the form was originally */suntu/ in Proto-Mandekan and underwent a metathesis.

4.1.1.3. <u>Resonants</u>. The resonants, irregular in the languages of Mandekan, are regular at this level of the reconstruction. The assumption made, and the tentative reconstructions proposed, point to the conclusion that */l/ was the primary resonant in Proto-Mandekan, the exception being */yiri/. The [r] has developed in medial position since that time to various degrees in the different languages.

4.1.1.4. <u>Palatals</u>. Palatals likewise are very irregular throughout the languages. */j/ is the most reconstructable palatal, with a few tentative reconstructions of both */y/ and */ny/.

4.1.1.5. <u>Velars</u>. The velar irregularities have also been ironed out, especially as concerns what appears to be a somewhat random palatalization of */k/ to [c] in some present forms. There also appears to be no reasonable explanation for what was reconstructed as */k'/ and */g'/ in Ml. These forms appear to reconstruct nicely with */k/ and */g/ in Proto-Mandekan. All that can be said at this point is that Xassonke (Ml) developed an [x] in some words which etymologically had */k/ in initial position, while other words retained the [k]. Similarly, Dyula (Ml) developed [ɣ] in some words which etymologically had */g/, while retaining [g] in others.

4.1.1.6. <u>Labio-velars</u>. These also show no irregularities.

4.1.1.7. <u>Proto-Mandekan consonant system</u>. It is important after having discussed individual proto-segments in depth to spend some time discussing the proto-system as a whole. The first major observation to be made is the absence of palatal consonants in medial position. Medial position is also devoid of */f/, */w/, */d/ and */gb/. Although initial position has a system of labials, dentals, palatals, velar and labio-velar , medial position has only labials, dentals and a velar. The only proto-segment occurring in medial position to the exclusion of initial position is */r/ which, as previously mentioned, is a highly tentative reconstruction. It is clear that many of the occurrences of [r] in the modern languages come from original */t/ or */l/.

The patterning of these series (i.e. dentals, velars, etc.) is also an interesting phenomenon in Proto-Mandekan. By far the most frequently used phonemes in both initial and medial positions were dental and velar. Within the dental series it is most interesting to note that */I/ was very common in medial position but not in initial position. On the other hand */s/ was very common and */t/ relatively common in initial position but not in medial position. */n/ was relatively common in both positions, as well as being the only consonant permitted in final position (where it was very frequent). */k/ and */g/ were in complimentary distribution, the former occurring initially and the latter medially. One might prefer to analyze [k] and [g] as allophones of one phoneme */K/ but this does not seem necessary for the purposes of this paper. */k/ and */g/ best preserve the phonetic quality of these segments in their respective positions. Whatever the analysis, velars were very common especially in initial position.

The most problematic aspect of the reconstruction of Proto-Mandekan consonants concerns laterals in medial position and palatals in initial position. Further data must be gathered before these problems can be solved with any assurance of success.

4.2. Mandekan vowels.

Table 18 — Medial Vowels

Front								No. of Corr.
	19. 'tooth'		43. 'smoke'		51. 'egg'			
*/i/	M1: *ny	$\boxed{i}$ n	s	$\boxed{i}$ si	k	$\boxed{i}$ li		16
	M2: *ny	$\boxed{i}$ n	s	$\boxed{i}$ si	k	$\boxed{i}$ li		
	2. 'one'		65. 'dry'					
?*/e/	*M1: k	$\boxed{e}$ l $\boxed{e}$ n	ja-l	$\boxed{e}$ n				3
	*M2: k	$\boxed{\underline{e}}$ l $\boxed{\underline{e}}$	ja-l	$\boxed{\underline{e}}$?				
	20. 'tongue'		23. 'foot'		53. 'fish'			
?*/ε/	*M1: n	$\boxed{ε}$ n	s	$\boxed{ε}$ n	ny	$\boxed{ε}$ ge	5
	*M2: n	$\boxed{ε}$ n	s	$\boxed{ε}$ n	ny	$\boxed{ε}$ gε	

Mid

	4. 'three'		21. 'neck'		28. 'navel'			
*/a/	*M1: s	$\boxed{a}$ ba	k	$\boxed{a}$ n	b	$\boxed{a}$ ta	14
	*M2: s	$\boxed{a}$ ba	k	$\boxed{a}$ n	b	$\boxed{a}$ ta-kun	

Back   No. of Corr.

		9. 'woman'	13. 'head'	61. 'new'	
*/u/	*M1:	m [u] so	k [u] n	k [u] ta	13
	*M2:	m [u] so	k [u] n	k [u] ta	
		22. 'hand'	29. 'skin'	56. 'big'	
*/o/	*M1:	b [o] lo	gb [o] lo	b [o] n	6
	*M2:	b [o] lo	gb [o] lo	b [o] n?	
		1. 'name'	7. 'person'	49. 'milk'	
*/ɔ/	*M1:	t [ɔ] gɔ	m [ɔ] g'ɔ	n [ɔ] nɔ	10
	*M2:	t [ɔ] gɔ	m [ɔ] gɔ	n [ɔ] nɔ	

Table 19 — Final Vowels   No. of Corr.

Front

		31. 'blood'	34. 'water'	43. 'smoke'	
*/i/	*M1:	jol [i]	j [i]	sis [i]	13
	*M2:	jɛl [i]	j [i]	sis [i]	
		39. 'sun'	77. 'see'		
?*/e/	*M1:	til [e]	y [e]		2
	*M2:	tɛl [e]	y [e]		
		8. 'man'	53. 'fish'	59. 'white'	
*/ɛ/	*M1:	k [ɛ]	nyɛg [ɛ]	gb [ɛ]	6
	*M2:	k [ɛ]	nyɛg [ɛ]	gb [ɛ]	

Mid

		3. 'two'	4. 'three'	16. 'eye'	
*/a/	*M1:	fil [a]	sab [a]	ny [a]	20
	*M2:	fil [a]	sab [a]	ny [a]	

Back

		6. 'five'	41. 'night'	55. 'dog'	
*/u/	*M1:	lool' [u]	s [u]	wul [u]	4
	*M2:	lo l [u]	s [u]	wul [u]	
		9. 'woman'	22. 'hand'	30. 'bone'	
*/o/	*M1:	mus [o]	bol [o]	kol [o]	7
	*M2:	mus [o]	bol [o]	kol [o]	
		1. 'name'	7. 'person'	49. 'milk'	
*/ɔ/	*M1:	tɔg [ɔ]	mɔg' [ɔ]	nɔn [ɔ]	9
	*M2:	tɔg [ɔ]	mɔg [ɔ]	nɔn [ɔ]	

4.2.1.   Discussion of Mandekan vowel irregularities.   Only a few problems remain to be solved in the vowel series.

4.2.1.1.   Front.   There are three irregularities in medial position which accidentally converge into an [i:ɛ] correspondence.   'Sun':*tile, *tɛle, 'straight':*tilen, *tɛlin and 'cut':*tigɛ, *tɛgɛ all share the same correspondence.

'Cut' was probably an [i-ɛ] vowel sequence in which [i] assimilated to [ɛ] in some of the languages of Ml.   The high front vowel is also attested in Group C in Vai [tiɛ].   Kurankɔ also shows the high front vowel in the monosyllable [ti], while Kɔnɔ has assimilated it to [ɛ] in [tɛ] after consonant deletion.   This will tentatively be reconstructed as */tigɛ/.

'Straight' is best reconstructed as as [ɛ-i] sequence.   Kurankɔ [tɛlinin] supports this reconstruction.   Ligbi [tɛlene] at least supports a reconstruction of [ɛ] with the second vowel having been lowered.   This will tentatively be reconstructed as */tɛlin/.

'Sun' is more difficult even to guess at.   Since these languages do not as a rule raise mid front vowels to high front vowels, the assumption will be made that the *Ml form */tile/ is correct, with lowering in *M2 being an assimilatory process across [l].

'Child': *den(den), *din poses a similar problem to 'sun' requiring much the same solution.   The other N. Mande groups support the */din/ reconstruction.

'I': *nɛ, *ne is easily resolved.   All languages of Ml except Dyula have deleted the final vowel leaving [n] as the phonetic shape of this word.   The vowel needed to be reconstructed in *Ml since it is attested.   However, this is the only instance of [ɛ] in all of the languages under consideration, the rest having deleted the vowel or attesting [e].   This should then be reconstructed */ne/.

4.2.1.2.   Mid.   These vowels are entirely regular.

4.2.1.3.   Back.   There are four problems to be resolved concerning back vowels in Proto-Mandekan.

'Belly': *kɔnɔ, *kon(d)o has been previously dealt with (cf. section 3.2.1.3.).   The evidence from S.W. Mande suggests */o/.

'Eat': *d̠umu̠n, *do̠mo̠n has also been discussed (section 3.2.1.3.).
The tentative reconstruction will be */o/.

'Who': *jo̠n, *jo̠n is difficult to sort out. The best solution appears
to be a tentative */o/ reconstruction with vowel lowering explaining the
[ɔ] reflex.

Reconstruction of vowels in the words above is difficult because of the
inconsistent patterning within the vowel system change. Although there
appear to be general tendencies, such as vowel lowering in prenasal posi-
tions, the exceptions are so many that any attempt at explanation is ad
hoc. This is especially true concerning slight vowel changes such as
[u] to [o] or [o] to [ɔ]. However, a few words showing great divergence
in vowel forms are difficult problems also. For example, 'blood': *jo̠li,
*jɛ̠li shows an [o:ɛ] matching for which a solution has not yet been found.
The most distantly related cognates show high back vowels, so */o/ will be
opted for tentatively.

4.2.1.4. Proto-Mandekan vowel system. It is important especially for the
Mande languages to investigate the vowel system as a whole because of the
harmony systems involved. The chart below illustrates the point. Words
of two or more syllables were compared to each other for vowel sequences.
The i-i or e-e listings represent the vowel sequences in the words.
The numbers to the right of these listings indicate the number of occurrences
of the listing found in the data.

Table 20 — Vowel Sequence

Like Vowels		'i' Combinations	
i-i (7)	u-u (4)	---	---
e-e (2)	o-o (8)	i-e (1)	---
ɛ-ɛ (1)	ɔ-ɔ (9)	i-ɛ (1)	i-ɔ (1)
	a-a (5)		i-a (4)

TOTAL: 36

Other Combinations

?u-e (1), u-a (3), u-o (2)

o-u (1), a-o (2)

?ɛ-e (1)

TOTAL: 10

---	u-i (1)
---	o-i (2)
ɛ-i (1)	ɔ-i (1)
	a-i (2)

TOTAL: 14

The "like vowel" combinations were not counted in the "non-like vowel" combinations. The breakdown for "like vowel" combinations and "non-like vowel" combinations is as follows:

(11)   Like vowel combinations =   36

    i   combinations   = 14

    a   combinations   = 11

    u   combinations   = 8

    o   combinations   = 7

    e   combinations   = 3

    ε   combinations   = 3

    ɔ   combinations   = 2

It should be mentioned that the totals do not add up for a reason. "Non-like vowel" combinations such as a-i were entered twice in the breakdown above, once as an a combination and once under i .

These statistics are significant evidence of the preference of Proto-Mandekan for like vowel sequences, explaining in part the rampant vowel assimilation occurring in these languages.

A few other interesting facts can be drawn from the data. First of all, the most likely vowels to combine with other vowels are [i] and [a], the least likely being the mid vowels [e], [ε] and [ɔ] which are very rare in "non-like vowel" combinations. This is not particularly remarkable for [e] and [ε] which are difficult to reconstruct even in "like vowel" sequences. They are simply vowels which are infrequently used (in these data). [ɔ], on the other hand, is extremely common in "like vowel" sequences yet very rare in "non-like vowel" sequences, occurring only twice, both times in combination with [i].

In Proto-Mandekan, then, the overwhelming tendency seems to have been vowel harmony. When this did not obtain in polysyllabic words [i] and [a] played a neutral role, combining with the other vowels fairly frequently. The mid vowels ([o] excepted) had a much more restricted frequency of occurrence.

Table 21 — <u>Proto-Mandekan System</u>

Initial

| <u>Consonants</u> | | | | | | <u>Vowels</u> |

*t   *k

*b   *d   *j   *gb

*f   *s

*m   *n   *ny

          *l

*w   *y?

Medial

| <u>Consonants</u> | | | | <u>Vowels</u> |

*t

*b   *g   *i   *u

          *s   *e?   *o

*m?   *n   *ɛ?   *ɔ

          *l   *a

          *r?

Final

| <u>Consonants</u> | | <u>Vowels</u> |

                                          *i   *u

                                          *e?   *o

                                          *ɛ   *ɔ

          *n   *a

Table 22 — <u>Reconstructed Word List - Proto-Mandekan</u>

1. 'name'   : *t<u>ɔg</u>ɔ   9. 'woman' : *muso   17. 'ear'   : *t<u>u</u>lo
2. 'one'   : *ke<u>l</u><u>en</u>   10. 'child' : *d<u>in</u>   18. 'mouth' : *da
3. 'two'   : *f<u>i</u>la   11. 'father': *fa?   19. 'tooth' : *nyin
4. 'three'   : *saba   12. 'mother': *ma? ~ *na? 20. 'tongue': *nɛn(e)
5. 'four'   : *n<u>aa</u>ni(n) 13. 'head'   : *kun   21. 'neck'   : *kan
6. 'five'   : *l<u>oo</u>lu   14. 'hair' : *kun-s<u>i</u>(<u>g</u>i)? 22. 'hand' : *bolo
7. 'person': *mɔgɔ   15. 'nose' : *nun   23. 'foot' : *sɛn
8. 'man'   : *k<u>ɛ</u>   16. 'eye'   : *nya   24. 'knee' : *kumbe<u>l</u><u>en</u>?

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Table 22 (continued)

25. 'nail'   : *bolo-sonin   50. 'grease'   : *kɛn~*tulu?   75. 'hear' : *mɛn
26. 'breast': *sin   51. 'egg'   : *(sisɛ-)kili 76. 'wash' : *k(w)o
27. 'belly' : *kondo   52. 'bird'   : * kɔnɔ   77. 'see'   : *ye
28. 'navel' : *bata(-kun)   53. 'fish'   : * nyɛge   78. 'give' : *di
29. 'skin' : *gbolo   54. 'snake'   : *sa   79. 'eat'   : *domo(n
30. 'bone' : *kolo   55. 'dog'   : *wulu   80. 'drink' : *min
31. 'blood' : *joli   56. 'big'   : * bon?   81. 'kill' : *faga
32. 'sky'   : *san(-kolo)   57. 'small'   : *dɔgɔ(n)?   82. 'cut'   : *tigɛ
33. 'fire' : *ta   58. 'black'   : *fin   83. 'hit'   : *gbasi?
34. 'water' : *ji   59. 'white'   : *gbɛ   84. 'sew'   : *kala
35. 'meat' : *sogo?~*sobo? 60. 'good'   : *nyi(n)   85. 'I'   : *ne
36. 'salt' : *kɔgɔ   61. 'new'   : *kuta   86. 'you'   : *i
37. 'many' : *sia-ma?   62. 'old'   : *kɔtɔ   87. 'he'   : *a
38. 'stone' : *kaba   63. 'hot'   : *gbando   88. 'we'   : *an?
39. 'sun'   : *tile   64. 'cold'   : *suma(n)   89. 'they' : *a(n)?
40. 'moon' : *kalo   65. 'dry'   : *ja-le(n)?   90. 'who'   : *jon
41. 'night' : *su   66. 'straight': *tɛlini   91. 'what' : *mun
42. 'rain' : *san-ji   67. 'come'   : *na   92. 'not'   : *tɛ
43. 'smoke' : *sisi   68. 'sit'   : *sigi   93. 'long' : *jan
44. 'sand' : *kɛnyɛ(n)   69. 'lie'   : *la   94. 'short' : *suntu?
45. 'rope' : *julu   70. 'sleep'   : *sinɔgɔ   95. 'here' : *yan
46. 'tree' : *yiri   71. 'die'   : *sa?   96. 'few'   : *dondi
47. 'leaf' : *fila   72. 'fall'   : *bi?   97. 'all'   : *bɛ
48. 'root' : *lili(n)?   73. 'stand'   : *wuli   98. 'path' : *sila
49. 'milk' : *nɔnɔ   74. 'say'   : *kuma   99. 'in'   : *kɔnɔ
                                                           100. 'if'   : *ni

Key: ___ : underscoring reflects tentative reconstruction of a segment.

      ( ) : indicates uncertainty of a reconstructed segment having existed.

       ?   : indicates that the reconstruction was from less than all
             languages.

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COLLOQUIUM ON THE CHADIC LANGUAGE FAMILY

University of Leiden, The Netherlands
September 15-17, 1976

Program:

P. Newman (University of Leiden), "Introductory remarks on Chadic: 'What we
     know, what we partially know, and what we wish we knew'"

Z. Frajzyngier (University of Colorado), "The emergence of a nominal plural:
     a case study in Chadic"

E. Wolff (University of Hamburg), "Patterns in Chadic (and Afroasiatic?)
     verb base formations"

M. Skinner (University of Wisconsin), "Gender in Pa'anci"

B. A. Salim (Bayero University College, Kano), "Phonemic vowel 'neutralization'
     in Hausa"

P. Jaggar (University of Hamburg), "The nature and function of auxiliary
     verbs in Hausa"

D. Bagari (Bayero University College, Kano), "Reanalyzing the causative
     morpheme in Hausa"

W. Leben (Stanford University), "Doubling and reduplication in Hausa plurals"

R. G. Schuh (University of California, Los Angeles), "Some general properties
     of West Chadic verbal systems"

R. M. Newman (University of Leiden), "Y-Prosody as a morphological process
     in Ga'anda"

W. E. A. van Beek (University of Utrecht), "Color terms in Kapsiki"

K. Ebert (Phillips University, Marburg), "Marking of definiteness in Kera"

N. Skinner (University of Wisconsin), "Domestic animals in Chadic"

P. Newman (University of Leiden), "Hlaterals (lateral fricatives) in Chadic"

J. Carnochan (SOAS), "Aspects of Bachama phonology"

     The conference procedings are to be published. For details write to
Dr. Roxana Newman, Afrikaanse Taalkunde, University of Leiden, Stationsplein
10, Leiden, The Netherlands.

PUBLICATIONS RECEIVED

Bender, M.L., J.D. Bowen, R.L. Cooper, and C.A. Ferguson, editors. <u>Language in Ethiopia</u>. Ford Foundation Language Surveys. London: Oxford University Press, 1976. Pp. xxv, 572. $22.50.

Jacquot, André, A.E. Meeussen, and Claire Grégoire. <u>Etudes bantous II</u>. (Myene and Laadi). Société d'études linguistiques et anthropologiques de France, publication 53. Paris: SELAF, 1976.

Le Saout, Joseph. <u>Etude descriptive du gban</u>. Langues et civilisations à tradition orale, no. 21. Paris: SELAF. Pp. 447.

Roulon, Paulette. <u>Le verbe en gbaya</u>. Etude du syntagme verbal en gbáyá-kàrá-ʔbòdòè (region de Bouar, R.C.A.). Société d'études linguistique et anthropologiques de France, publication 51-52. Paris: SELAF, 1975.

Valkhoff, Marius F., editor. <u>Miscelânea Luso-Africana</u>. Lisbon: Junta de investigações científicas do ultramar, 1975. Pp. 319.

Announcement:

Beginning with the 1976 volume, James E. Redden has been appointed
Section Head for the African Linguistics and Afro-Asiatic Linguistics
Sections of the Modern Language Association of America International
Bibliographies. Authors and publishers are requested to send him complete
bibliographic information including page numbers on books and articles on
African languages and linguistics and also on the languages and linguistics
of the Semitic Middle East. However it will not be necessary to send items
in the standard journals such as Studies in African Linguistics since these
are covered automatically. Redden's address is Department of Linguistics,
Southern Illinois University, Carbondale, IL 62901.

Corrigendum:

The names of Kay Williamson, Ben Elugbe, and Sister Ann Angela Uwalaka,
all of the University of Ibadan, were inadvertently omitted from the Table
of Contents as co-authors with Peter Ladefoged of the article "The stops of
Owerri Igbo" appearing in Papers in African Linguistics in Honor of Wm. E.
Welmers (Supplement 6 to Studies in African Linguistics). The editors of
the supplement regret this oversight and apologize to those concerned.

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