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NOUN CLASSIFICATION IN WOLOF:
WHEN AFFIXES ARE NOT RENEWED*

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The Wolof noun class system exhibits a variety of class assignment strategies based on the intersection of semantic, morphological, phonological and sociolinguistic criteria. This study examines and analyzes the many strategies for class assignment that have coalesced in the Wolof noun class system, including the tendency towards a single default class, and an unusual copy process in which phonological material is copied from the stem to the class marker in a process that looks superficially like reduplication. Wolof noun classification is examined within the comparative context of its two closest sister languages, Pulaar and Seereer-Siin, and is shown to contrast with them in that the disappearance of class prefixes did not entail their replacement by suffixes. Finally, an argument is made that noun class systems like that of Wolof which appear to be somewhat incoherent from a semantic point of view are actually typical because noun classification is not only an artifact of the human mind, but also an artifact of human language.

1.0 Introduction

Wolof is a member of the North Atlantic sub-group of the Atlantic family of Niger-Congo languages, a sub-group that is characterized by some of the most extensive and morphophonologically elaborate noun class systems found in

natural language.[1] However, for reasons both internal and external to the language, Wolof noun classification has undergone a series of rapid changes in a relatively short period of time, all of which have contributed to an ongoing realignment of the system and the expansion of a default class. This article examines the realignment of the Wolof noun class system within the North Atlantic perspective, focusing specifically on the emergence and disappearance of various strategies for class assignment, all of which have left their mark on the modern noun class system. Although noticeable in other dialects, the expansion of the default class is most advanced in urban dialects of Wolof, and especially that of Dakar, the capital, where there is large-scale borrowing of lexical items from French and a high concentration of non-native speakers who use the language on an everyday basis.

2.0 The Wolof noun class system

There are ten noun classes in Wolof, eight singular and two plural. Of the singular noun classes one serves a second function as a diminutive class. A noun may thus belong to as many as three classes: a singular, a plural, and a diminutive singular class. The most salient aspect of Wolof noun classification, and that which distinguishes it from other North Atlantic languages, is the lack of a class marker on the noun itself, except, unproductively, in a handful of restricted cases that show stem-initial consonant mutation, (e.g., *bët/gët* 'eye/eyes' and *baaraam/ waaraam* 'finger/fingers')[2] and more productively in the diminutive form of nouns beginning with certain consonants that undergo mutation.

   A noun class marker appears in the form of a single consonant on nominal dependents such as determiners and relative particles. Throughout this article noun classes will be referred to by the consonant that appears on the dependents. The set of Wolof noun classes is listed in (1).

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[1]   These include Fula and Seereer-Siin. For a description of the former see especially Arnott [1970] and Sylla [1982]; for the latter, see Fal [1980] and Mc Laughlin [1992]. For more general overviews of noun classification in the Atlantic languages see Sapir [1971] and Wilson [1989].

[2] Throughout this article I have followed standard Wolof orthography, as used in Fal, Santos, and Doneux [1990]. Geminates are written as sequences of two identical consonants as in *bëgg* 'like'. Prenasalized stops are written as a stop preceded by *m* [for labials] or *n* [for all others], as in the following examples: *mbaa* interrogative particle, *ndox* 'water', *kànja* 'okra'. An acute accent over a vowel, as in *béy* 'goat', stands for [+ATR]. Long vowels are written as a sequence of two identical vowels, as in *buur* 'king', and if the long vowel is [+ATR] the acute accent appears only on the first vowel of the sequence, as in *séex* 'twin'. The symbol *ë* has the value of a schwa. The symbol *à* indicates a maximally open vowel [Ka 1990], and appears only before a prenasalized consonant or a geminate. For a description of the phonemic inventory of Wolof see Ka [1994].

(1)   Singular classes   Plural classes
                k-   *ñ-*
                b-   *y-*
                g-
                j-
                l-
                m-
                s-
                w-

The *k*-class and its corresponding plural, the *ñ*-class, have a very restricted membership consisting of only a few nouns. The *k*-class has only two members: *nit* 'person' and *këf* 'thing', while the *ñ*-class includes *nit* and, depending on the speaker, *jigéen* 'women', *góor* 'men', and *gaa* 'people'. Other than these four cases, however, plural nouns are always in the *y*-class.

Classes are uniquely either singular or plural, thus a change in number involves a change in class. Given that in general there are no morphological class markers on a noun, singular and plural forms are indistinguishable unless they occur in a noun phrase that also includes a dependent that agrees with the noun. Examples of singular and plural forms of nouns, followed by their definite article, are presented in (2).

(2)   Class   Singular   Plural   Gloss
        k   *nit ki*   *nit ñi*   'the person' ('people')
        b   *tëgg bi*   *tëgg yi*   'the blacksmith(s)'
        g   *kër gi*   *kër yi*   'the house(s)'
        j   *jigéen ji*   *jigéen yi/ñi*   'the woman' ('women')
        l   *ngunu li*   *ngunu yi*   'the chicken coop(s)'
        m   *picc mi*   *picc yi*   'the bird(s)'
        s   *ndaw si*   *ndaw yi*   'the young woman' ('women')
        w   *waasintoor wi* *waasintoor yi*   'the fish scale(s)'

In addition to surfacing on the definite article, the noun class marker appears on various other dependents, such as anaphora and relative particles, as illustrated in (3) for the nouns *kër* 'house' (*g*-class) and *nit* 'person' (*k*-class).

(3)   'house'   'person'   Gloss
      Demonstrative   *kër gii*   *nit kii*   'this x'
                        kër gale   *nit kale*   'that x'
      Anaphor   *googu*   *kooku*   'the aforementioned x'
      Relative   *kër gu baax* *nit ku baax* 'an x that is good'

As illustrated in (4), diminutive formation in Wolof involves both a transfer to the *s*-class and stem-initial consonant mutation in stems that begin with *b, d, j, g, s,* and *x,* and some, although not all, that begin with an epenthesized glottal stop.[3] Otherwise, there is no change in the stem-initial consonant.[4]

(4)	Singular	Class	Diminutive (*s*-class)	Gloss
	buur	*b-*	*mbuur*	'king'
	béy	*w-*	*mbéy*	'goat'
	doj	*w-*	*ndoj*	'pebble', 'stone'
	deret	*j-*	*nderet*	'blood'
	jigéen	*j-*	*njigéen*	'woman'
	jàkka	*j-*	*njàkka*	'mosque'
	géwél	*b-*	*ngéwél*	'griot'
	guy	*g-*	*nguy*	'baobab tree'
	séq	*g-*	*céq*	'cock'
	séex	*b-*	*céex*	'twin'
	xaj	*b-*	*qaj*	'dog'
	xar	*m-*	*qar*	'sheep'
	[ʔ]oto	*b-*	*koto*	'car' (<Fr.)
	[ʔ]àlluwa	*j-*	*kàlluwa*	'Qur'anic board' (<Ar.)

The *s*-class, however, is not uniquely a diminutive class, and many non-diminutive nouns are in that class in their singular form (e.g., *saa* 'moment', *xorom* 'salt', and *asamaan* 'sky'). The diminutive and singular non-diminutive forms of nouns in this category would therefore be indistinguishable unless they

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[3] The following chart shows the initial consonant mutations that are operative in the Wolof noun class system. Voiced stops become prenasalized in the diminutive class, and fricatives, which are voiceless, become stops. In some cases the epenthesized glottal stop becomes a voiceless velar stop.

Non-diminutive	*b*	*d*	*j*	*g*	*s*	*x*	*ʔ*
Diminutive	*mb*	*nd*	*nj*	*ng*	*c*	*q*	*k*

[4] These data were all elicited in Dakar from Babacar Mboup, a griot from Kaffrine. For many Wolof speakers, especially those from large urban areas, only stop-initial stems undergo consonant mutation in diminutive formation, becoming prenasalized. The fact that Mboup is a griot indicates that his speech may be more elaborate than that of non-griots, and therefore not typical of the 'average' Wolof speaker. However, it is especially for those reasons that I have chosen to include Mboup's forms since they present the full array of synchronic forms and may ultimately prove useful in diachronic studies.

were to appear in context[5] or were to undergo consonant mutation, as in the word for 'salt', illustrated in (5).

(5)   *xorom*   *s*-class   non-diminutive   'salt'
          qorom   *s*-class   diminutive   'small quantity of salt'[6]

     Finally, the class with the largest membership is the default *b*-class, about which more will be said in §4.3.

     Wolof nouns may be assigned to a class on the basis of a variety of factors, including semantic and phonological ones. Since every noun is required by the grammar to belong to a class,[7] there are also default strategies of class assignment for nouns that do not immediately fit other classificatory criteria. As we shall see in §4, one of the primary reasons for the current expansion of the *b*-class is its status as a default class for loanwords from French.

3.0 Wolof noun class markers in the larger context

Wolof is atypical of Niger-Congo languages, and especially the North Atlantic sub-group, in that it exhibits no class marker on the noun itself other than in the few residual cases of consonant mutation described above. Within the vast Niger-Congo family, noun class markers may surface as prefixes, suffixes, or in some cases both, leading Welmers [1973:209] to conclude that nouns in all classes had both prefixed and suffixed markers in the protolanguage, and were thus doubly marked for class. However, Greenberg [1977, 1978] posits a different situation in which a demonstrative, which either precedes or follows the noun, gradually becomes a class marker via the intermediate stages of definite article and non-generic article. As the affix erodes phonologically, it may be renewed morpho-logically. Eroding prefixes are replaced by class suffixes, as in Pulaar, and eroding suffixes by prefixes, as Greenberg [1978] claims for Gurma, a Gur language. Childs [1983] shows that a process of noun class affix renewal has gone on in Kisi, a member of the South Atlantic sub-group, moving from an older

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[5] There is a marked preference to use diminutives only in conjunction with the preposed 'non-generic' article, *as*. In fact, in working on the diminutive forms with Mboup, I first tried to elicit them in a noun phrase consisting of N plus a postposed definite article, but he preferred to give them to me in the "non-generic" form, saying that it sounded more natural.

[6] As Robert Botne has suggested [personal communication], based on semantic and morpho-logical factors it would certainly be feasible to consider the diminutive *s*-class a separate class from the non-diminutive *s*-class. My reasons for presenting a single *s*-class here are based solely on the informal convention of referring to classes by the initial consonant of the definite article in scholarship on Wolof.

[7] In describing the difference between noun classes and noun classifiers Dixon [1986] defines the former as an obligatory grammatical system, while the latter are optional and discourse sensitive.

system of prefixation to one of suffixation [1983:17]. Williamson [1989:33] suggests that if Proto-Niger-Congo had an SOV word order, then modifiers, including demonstratives, would consistently precede the noun, thereby giving rise to prefixes, and that a system such as that described by Childs in which class suffixes represent an innovation is exactly what we would expect. Williamson goes further than Greenberg, then, in positing that class prefixes are older than suffixes in Niger-Congo, a hypothesis borne out by evidence from the North Atlantic languages.

3.1 The North Atlantic context. Greenberg's [1978] schema of the evolution of class markers in Niger-Congo is given in (6), and includes four stages towards the development of a class prefix.

(6)   Stage 0   no class marker on the noun (demonstrative)
         Stage 1   definite article that shows class
         Stage 2   non-generic article showing class ('a certain' X)
         Stage 3   class prefix

Within this perspective, the North Atlantic languages, Wolof, Pulaar, and Seereer, show varying degrees of post-stage 3 development. The original prefix has in some instances become a suffix, and there is also evidence of both prefix and suffix existing or having existed simultaneously. The different kinds of morphological marking are shown in (7-9) via the set of cognates for the word for 'man.'

(7)   Pulaar

	n.	det.		
a.	*gor-ko*	*oo*	'the man'	Class 1
b.	*wor-ɓe*	*ɓee*	'the men'	Class 2
c.	*ngor-on*	*kon*	'the men' (diminutive)	Class 21

(8)   Seereer-Siin

	n.	det.		
a.	*o-koor-oxe*		'the man'	Class 1
b.	*ø-goor-we*		'the men'	Class 2
c.	*o-ngoor-onɢe* [8]		'the man' (diminutive)	Class 12

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[8] *nɢ* represents a voiced prenasalized uvular stop.

(9)   Wolof
   n. det.
  a. *góor* *gi* 'the man'   *g*-class
  b. *góor* *yi* 'the men'   *y*-class

   det. n.
  c. *as* *ngóor* 'a (certain) man' (diminutive) *s*-class

In Pulaar, the Senegalese dialect of Fula, which has twenty-one classes, the prefix has been reduced to stem-initial consonant mutation; in addition, there is a class suffix on the stem, so the noun is actually doubly marked for class. The determiner, which strongly resembles the class suffix, is an independent word.

 Seereer-Siin is morphologically a little more conservative than Pulaar, since at least some of the older class prefixes (ten of fifteen) are retained [Mc Laughlin 1994: 284-5]. In both cases—overtly prefixing and non-prefixing classes—there is consonant mutation, so in a sense class is again doubly marked on stems with overt prefixes.[9] The determiner behaves as an enclitic in Seereer, rather than standing as an independent word as in Pulaar.

 Now we come to Wolof, which differs from the other languages in that other than diminutive formation there is generally no morphological class marking on the noun itself, except in a very few cases, mentioned above, which show what appears to be lexicalized consonant mutation. Although there are just a handful of these examples in the language, their interest lies in the fact that they suggest that Wolof had a productive consonant mutation system, like Seereer-Siin or Pulaar, which served as a class marker at some point in its history. It is within this perspective that the copy process alluded to in the abstract becomes comprehensible, as we shall see in §4.2.

 The table in (10) sums up the types of class markers in each of the three languages.

(10) Class markers in the North Atlantic languages

	PREFIX	CONSONANT MUTATION	SUFFIX	CLITIC DETERMINER	INDEPENDENT DETERMINER
Seereer-Siin	✓	✓		✓	
Pulaar		✓	✓		✓
Wolof		(traces)			✓

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[9] If we analyze consonant mutation as the result of the association to the left edge of a stem of a floating feature which constitutes part of the prefix itself, stems would not be doubly marked at that level of abstraction.

Class marking surfaces only on independent determiners in Wolof, with a few isolated instances of consonant mutation on the noun being the exception. Thus, there is basically only one kind of class marker in Wolof. On the other hand, Seereer-Siin and Pulaar exhibit three kinds of class markers: either a prefix or suffix, consonant mutation, and a determiner which is either independent or an enclitic. The paucity of class marking in Wolof compared to its sister languages must certainly be taken into account in the realignment of the noun class system.

4.0 The bases of noun classification

As is apparent from the table in (10), Seereer-Siin represents an older system in which class prefixes are present, while Pulaar represents a system in which prefixes have been replaced by suffixes. In Wolof, however, although the prefixes have disappeared, they have not been replaced by suffixes. This singular fact is indirectly responsible for the rise of several alternative bases of noun classification which will be examined in the following discussion.

Wolof is a fairly well documented language with several descriptive grammars and dictionaries that date from the beginning of the nineteenth century.[10] These works provide a wealth of information on the noun class system and the various bases of class assignment over an approximately two hundred year period. When examining these sources and comparing their descriptions to that of modern Wolof, what is striking is how all of the factors involved in class assignment discernible in the earlier accounts of the language are still to be found in modern Wolof although they may no longer be productive, hence the emphasis in this article on the notion of realignment rather than innovation within the noun class system. The main change that has taken place is the continued expansion of the default class, so that many nouns that were in other classes at an earlier stage are now assigned to the *b*-class.

Determining the productivity of the different means of classifying nouns in Wolof is extremely difficult because the output of a productive process is indistinguishable from that of a lexicalized form, but one way of approaching the problem is to consider how loanwords are assigned to a class. Wolof has a great number of borrowings from Arabic and, especially in urban Wolof, from French. In addition, there are some older loanwords from Portuguese, and a few from English.[11] Not all of these loanwords surface in the *b*-class, and in fact

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[10] These include Boilat [1858], Dard [1825 and 1826], Delafosse [1927], Faidherbe [1887], Gamble [1957], Kobès [1855 and 1858], Njie [1982], Rambaud [1898], Roger [1829], Samb [1983], Sauvageot [1963], Senghor [1943], and Ward [1939]. Several of the shorter, older studies are reproduced in Manessy and Sauvageot [1963].

[11] I am speaking here of Senegalese Wolof, where the influence of the former colonial language, French, is very strong in urban areas. Wolof spoken in The Gambia has borrowed from its former colonial language, English, on a much greater scale. Interestingly, however, Gambian Wolof has

many of them show evidence of being assigned to a class on other bases, including semantic and phonological ones, that superseded default class assignment at some point. These bases may therefore be interpreted as having been productive in the past; all new loans, however, are assigned to the *b*-class, indicating that the default basis is the only productive one in modern Wolof.

The primary reason for examining the historical sources is to better under-stand the synchronic situation, but those sources also have their drawbacks. As is the case with most dictionaries, we may assume that the conservative form (i.e., that used by older speakers or the more elaborate and sometimes rarer form) is most likely to be recorded as the sole entry, thus making both variation and realignment in the noun class system more difficult to track.[12] Likewise, the extent of variation currently found among Wolof speakers in my own research is not reflected in either of the two most current dictionaries [Fal, Santos, and Doneux 1990; Munro and Gaye 1991].

Although most of the historical sources make some attempt to explain the bases of noun classification, generally favoring a single criterion (semantic, phonological, etc.) even when faced with many counterexamples, the purpose of the following discussion is not to give a chronology of dominant bases of noun classification. Not only would it be difficult to do so based on the obvious limitations of the available sources, but also, I believe, it would be the wrong approach to understanding noun classification in Wolof. Rather, the following discussion is based on the premise that the eventual erosion and disappearance of class markers on the Wolof noun, as sketched in §3, made class assignment more volatile, and as a result several different bases of classification came into play. At any one point in this period, there was no doubt considerable variation both among the speech community as a whole and within the repertoire of individuals. Given that the only productive means of class assignment in modern Wolof is to place nouns in the *b*-class (witnessed by the assignment of all new loans to this class) the many obvious traces of earlier assignment strategies mentioned in the historical sources can only be attributable to lexicalization.

The bases of noun classification that go to make up the Wolof noun class system, then, may best be seen as a series of discernible patterns, including semantic, morphological, phonological, and sociolinguistic ones, that frequently overlap. In contrast, however, it is important to note that no single basis of noun

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also borrowed many words and expressions indirectly from French via contact with urban Senegalese Wolof.
[12] In my own investigations I have found that Wolof speakers (mostly urban) will often report, for example, that although they use the *b*-class for a noun, there is a different "real" form in "deep" Wolof. In addition, when I have used a noun class marker other than *bi* for certain lexical items, I have found that people frequently comment on it, complimenting me on speaking "pure" or "ancient" Wolof.

classification can account for the entirety of the Wolof noun class system as we shall see in the following discussion.

4.1 Semantic class assignment. The point of departure for most studies of noun classification is to determine what semantic categories are encoded in a classifying language. From this perspective noun class systems are, as Haiman [1985:162] has remarked, "notoriously dysfunctional". According to Corbett [1991:8], strict semantic systems are "not particularly common" and are generally limited to languages with only two or three genders. Other gender systems that are predominantly semantic are still characterized by what Corbett terms "leaks" [1991:13], namely areas in which the semantic coherence of the system as a whole breaks down. Despite these observations on gender in natural language, approaches to noun class systems still grant the semantics of such systems a privileged status. Craig [1986], in her introduction to the proceedings of a symposium on categorization and noun classification, sums up the accepted research agenda on noun classification by stating the following:

> If the apriori assumption is that all inclusions of items in a class have (had) some semantic motivation, the challenge consists in reconstructing the linking stages of the expansion of the class [Craig 1986:7].

The outcome of such apriori assumptions has been to proceed in one of two ways. The first, and most obvious, is towards the reconstruction of a more coherently semantic system in the protolanguage, and the second is to reevaluate the notion of semantic categories through cognitive approaches such as Lakoff's [1987] experiential realism where cognitive categories, of which noun classes are a prime example, are regarded as artifacts of how the human mind works rather than artifacts of how the external world is arranged.[13] Such an approach may work for some languages, as Lakoff claims it to do for Dyirbal, an Australian language with a small number of noun classes, but the large noun class systems of the North Atlantic languages remain opaque with regard to a full semantic explanation. We will return to some of these ideas in §5 after examining the various bases of class assignment in Wolof.

Semantic categories encoded to a certain extent in the noun class system of Wolof include liquids (*m*-class), trees (*b*-class), fruits (*g*-class), and family members, especially those of maternal descent (*j*-class). Although the *m*-class contains certain liquids such as *ndox* 'water', *meew* 'milk', *saw* 'urine' and *soow* 'curdled milk', it also contains many words that are not liquids, and there are a great number of liquids that do not fall into that class, such as *deret* (*j*-class)

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13 Another alternative involves the combination of both approaches, as, for example, Denny and Creider [1986] have attempted for Proto-Bantu.

'blood', *diwlin* (*j*-class) 'vegetable oil', and *kokaa* (*b*-class) 'Coca-Cola'.[14] The last word is, obviously, a relatively recent loan from French; therefore, it falls into the default class.

A more interesting example is *biiñ* 'wine', an earlier loan from Portuguese *vinho*. Most speakers assign *biiñ* to the *b*-class, but some more conservative or elaborate speakers will accept it in the *m*-class on the grounds that it is a liquid, although they exclude *kokaa* from the *m*-class even though it is a liquid.[15] The fact that *biiñ mi* is occasionally deemed grammatical, but that **kokaa mi* is not, shows that the principle of assigning liquids to the *m*-class is no longer productive, but could have been at an earlier point when *biiñ* entered the language. The potential neatness of the diachronic situation, however, is substantially muddied by existing sources on Wolof. One of the earlier, and quite insightful, written sources, Rambaud [1898:14], gives a list of liquids in the *m*-class, but says that there is one exception, *biiñ*, which he lists as being in the *b*-class, justified by the fact that it is a recent loan.[16] It is impossible to say when the word entered Wolof, but since it was borrowed from Portuguese, it is my guess that it was borrowed at least one hundred and fifty to two hundred years before Rambaud wrote his description. Delafosse [1927:38] uses Rambaud's data for his analysis and specifically mentions the fact that *biiñ* is in the *b*-class, whereas it would have been "natural" to put it with other liquids in the *m*-class.[17] Delafosse attributes the assignment of the word to the *b*-class because its initial consonant is [*b*], an issue that will be taken up in the discussion of the copy rule in the next section.

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[14] While other semantic factors may well be at work here in assigning these nouns to classes other than the liquid class, with the exception of the recent loan, *kokaa*, the two other North Atlantic languages classify these nouns in their respective liquids classes.

[15] The few speakers who accept *biiñ* in the *m*-class but not *kokaa* generally justified the former by saying that it was a liquid ["like water and milk"] and the latter by saying something along the lines of "no-one says *kokaa mi*". I suspect, however, that there may be other reasons for the reported grammaticality of *biiñ* in the *m*-class, especially when one considers the individuals who deemed the form grammatical. One was a griot and two were Wolof language teachers, and in both cases it would not be surprising to see a tendency to avoid the *b*-class. The teachers spoke urban Wolof, characterized by the greatest use of the *b*-class, and were not in full command of "deep Wolof" which would be the prestige dialect for a Wolof teacher. The griot's speech is supposed to be more "elaborate" than that of non-griots, and a prime marker of elaboration is the use of noun classes other than the *b*-class. In both cases, then, the acceptance of the form could be explained by two factors: analogy with other liquids and motivation to avoid the *b*-class.

[16] Rambaud's exact wording is: "Il n'y a qu'une exception: *biñ bi* <<le vin>>; mais c'est un mot tout récemment importé dans la langue."

[17] It is also possible that the acceptance of *biiñ* in the *m*-class by the three speakers described in footnote 15 is an innovation and that the noun never appeared in that class before. It should be noted that I never came across any spontaneous examples of *biiñ* being assigned to the *m*-class in natural speech. The alleged form is based entirely on grammaticality judgements by those three speakers, and I have always found that urban Wolof speakers tend to hesitate a great deal on grammaticality judgements on noun classes.

A less controversial semantic category in the Wolof noun class system encodes the distinction between trees (*g*-class) and their fruit (*b*-class). In most cases, with the notable exception of the word for 'baobab' which exhibits consonant mutation, the word for a tree and its fruit are the same, as evidenced in (11). The fact that they fall into different noun classes may help to disambiguate them.

(11)   *g*-class (tree)   *b*-class (fruit)

garab	'tree'	doom	'fruit'
guy	'baobab tree'	buy	'baobab fruit'
tàndarma	'date tree'	tàndarma	'date'
ditax	*Detarium senegalense*	ditax	fruit of *D. senegalense*
karosool	*annona muricata*	karosool	fruit of *annona muricata*
guyaab	'guava tree'	guyaab	'guava'
màngo	'mango tree'	màngo	'mango'
banaana	'banana tree'	banaana	'banana'

Included in these examples are several loanwords from Portuguese, French, or other sources: *guyaab*, probably from Portuguese *goiaba* or French *goyave* 'guava';[18] *karosool* from French, and *màngo* and *banaana* which could be from any of several sources. The fact that the trees are not assigned to the default class supports the idea that a semantic distinction is being maintained.

While there are many other attempts in the literature at assigning Wolof nouns to semantic categories, the last example I will look at is that of the *j*-class, which contains a large number of nouns denoting family members, many maternally linked, as seen in the examples in (12).

(12)   *j*-class nouns denoting family members

yaay	'mother'
doom	'child'
nijaay	'maternal uncle'
yumpaañ	'maternal uncle's wife'
rakk	'younger sibling'
mag	'older sibling'
jabar	'wife'
jëkkër	'husband'

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[18] Fal *et al.* [1990] simply list *guyaab* as a borrowing (*emprunt*) without specifying the language it came from. Since the French voiced labiodental fricative [v] frequently becomes [b] in Wolof [eg: *kubéer* < *couvert*; *saabu* < *savon*] the word could be borrowed from either language.

As with all the previously mentioned noun classes that have some type of semantic basis, the content of the *j*-class is far from clear cut. The majority of nouns in this class do not fit the semantic category of family members, and there are nouns denoting family members that are not in the *j*-class.

These few examples of partial semantic categories in Wolof, of which there are several more, are typical of noun class systems, leading to a common belief that such systems represent a fall of sorts from a more coherent semantic system. Most noun class systems are, however, like the Wolof one in that they encode a variety of semantic, morphological, and phonological categories. These and related issues will be addressed in §5.

4.2 Phonological class assignment. Recent discussions of gender in natural language [Aronoff 1994; Corbett 1991] attest to instances of inflectional systems that are partially determined by phonological form. In such cases the phonological form of a given stem can be correlated with a specific gender. In Hausa, for example, there is an assignment rule by which nouns ending in the string *-aa* are assigned to the feminine gender [Corbett 1991:53], while in Yimas, a language of New Guinea, nouns ending in the string *-mp* are assigned to gender vii [Aronoff 1994:116; Corbett 1991:56]. It has long been noted [Rambaud 1898; Delafosse 1927; Ward 1939; Senghor 1943] that in Wolof the phonological form of a noun may serve as the basis for determining the noun class to which it is assigned. Moreover, in considering patterns of change in noun class assignment between nineteenth century data and her own data from modern Wolof, Irvine [1978:55] remarks that one type of shift is towards a phonological basis of class assignment so that the class marker 'harmonizes' with the initial consonant of the noun.

Unlike those instances described in the literature in which the stem and gender marker, although correlated, retain independent phonological forms, Wolof is, to my knowledge, unique in exhibiting an actual transfer of phonological form from stem to inflectional class marker: the inflectional class marker, revealed in agreement, is an actual copy of the stem-initial consonant, as the examples in (13) show.[19]

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[19] The copy process in Wolof is distinct from the alliterative concord found in many Niger-Congo languages where the noun class marker surfaces on noun, dependents, and sometimes [especially in Bantu languages] verbs. In those cases, the noun class agreement feature percolates to dependents and surfaces as a class morpheme, resulting in an alliterative effect as in the following example from Pulaar which shows the morpheme junctures between stem and class marker: *jun-ngo maw-ngo ngoo*[hand-cl. big-cl. det.] 'the big hand'. Class markers, for the most part, do not surface on nouns in Wolof, thus in the Wolof copy process it appears that the initial consonant of the *stem* is being copied.

(13) Noun + determiner (UR: /Ci/)

g-class   **j-class**

góor	*gi*	'the man'	*jàmm*	*ji*	'the peace'
gafaka	*gi*	'the bag'	*jigéen*	*ji*	'the woman'
gaana	*gi*	'the leper'	*jinax*	*ji*	'the mouse'
ginaar	*gi*	'the chicken'	*jiit*	*ji*	'the scorpion'
gaynde	*gi*	'the lion'	*jumaa*	*ji*	'the mosque' (<Ar.)

w-class   **s-class**

waasintoor	*wi*	'the fish scale'	*saa*	*si*	'the moment '(<Ar.)
warga	*wi*	'the tea' (<Ar.)	*saxar*	*si*	'the smoke'
wanag	*wi*	'the toilet'	*sàngara*	*si*	'the alcoholic drink'
waxambaane	*wi*	'the young man'	*seytaane*	*si*	'the devil' (<Ar.)
waxtu	*wi*	'the hour'	*suukar*	*si*	'the sugar' (Ar./Fr.)

m-class

malaaka	*mi*	'the angel' (<Ar.)
miskin	*mi*	'the unfortunate one' (<Ar.)
moroom	*mi*	'the peer'
muus	*mi*	'the cat'
mala	*mi*	'the animal'

In order to rule out the possibility of mere coincidence between the initial consonant of the noun and the consonant that surfaces as a class marker in the singular classes, we will take a close look at general patterns of class assignment, paying careful attention to loanwords, to show that the assignment of nouns to a class on a phonological basis merits serious consideration. Of the eight singular noun classes, four of them seem to particularly favor this basis of class assignment, namely the *g-*, *j-*, *m-*, and *w-* classes. Of the other classes, the *s*-class shows a tendency towards phonological assignment, the *l*-class does not, the *k*-class is too restricted to admit this kind of assignment (recall that there are only two nouns in the *k*-class; see §2.0), and the default *b*-class is too vast to contribute in any significant way to supporting the hypothesis of phonological class assignment.[20] In order to illustrate that the correlation is more than a coincidence

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[20] Since the majority of Wolof nouns are in the *b*-class, most *b*-initial nouns are in that class, but it is impossible to tell whether they are there on the basis of phonological, default, or other assignment. Recall the case of the noun *biiñ* 'wine' in the discussion in §4.1 where Rambaud [1898:14] says that it is in the *b*-class because it is a loan (a case of default assignment), while Delafosse

and that there is a reality to the phonological basis of class assignment, let us consider the data in (14) which consist of a count of the noun class assignment of all *g-, j-, l-, m-, s-*, and *w*-initial nouns listed in Fal, Santos, and Doneux's [1990] dictionary, which is the most extensive dictionary of modern Wolof available.

The first column indicates the initial consonant of the noun followed by the total number of tokens that appear in the dictionary in parentheses. The other columns indicate which noun classes those nouns appear in. These are given first by raw score, followed by the rough percentage of nouns for raw scores of over two tokens. The correlation between the initial consonant of the noun and that of the noun class, indicating phonological class assignment, is given in boldface.

(14) Class assignment of relevant consonant initial nouns

Initial C	Classes							
of noun	*b-*	*g-*	*j-*	*l-*	*m-*	*s-*	*w-*	*k-*
g (127)	50 39%	**68 53.5%**	1	0	1	1	6 4.5%	0
j (111)	64 57.5%	5 4.5%	**40 36%**	0	0	0	2	0
l (125)	63 50%	20 16%	13 10%	**5 4%**	7 5.5%	0	16 13%	1
m (102)	25 24.5%	19 18.5%	1	0	**46 45%**	0	11 10.5%	0
s (280)	135 48%	41 14.5%	6 2%	2	20 7%	**49 17.5%**	27 9.5%	0
w (134)	26 19%	26 19%	9 6.5%	0	2	1	**70 52%**	0

What we find is that for *g*-initial and *w*-initial nouns, the majority (53.5% and 52%, respectively) fall into the class that corresponds to the initial consonant. For *m*-initial nouns, although the majority do not fall into the *m*-class, those assigned to the *m*-class constitute the largest group by class with a score of 45%. The *j*-initial nouns also do quite well, showing 36% correspondence with the *j*-class, although the largest number of *j*-initial nouns fall into the *b*-class. The *s*-initial and *l*-initial nouns do less well, with scores of only 17.5% and 4%, respectively. Despite these low scores, what can be gleaned from these percentages is that for *g-, j-, m-, s-*, and *w*-initial nouns, either the largest (in the case of *g-, m-*, and *w*-initial nouns) or second largest number of nouns (in the case of *j-* and *s*-initial

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[1927:38] claims it is there because of its initial consonant (phonological assignment). These two different criteria may work together to reinforce the class of the noun.

forms) show a correlation between their initial consonant and the consonant of the class to which they are assigned. In addition, for all token sets in which the correlation between initial consonant and noun class does not constitute the largest group of nouns in the respective category, the *b*-class constitutes the largest group. What this tells us is that the vast majority of Wolof nouns are assigned to either the *b*-class, possibly on a default basis, or to the class that corresponds to their initial consonant, that is, on a phonological basis, and that nouns with certain initial consonants appear to favor phonological class assignment more than others.

While the patterns of class assignment that emerge from these rather straight-forward quantitative data strongly support the reality of phonological class assignment, there are also many other considerations that enhance the hypothesis. First is the class assignment of loanwords on a phonological basis, of which there are some striking examples, a few of which are given in (15).

(15) *galaas* *gi* 'the ice'   < Fr.   *jinne* *ji* 'the djinn'   < Ar.
      garees *gi* 'the fat'   < Fr.   *jinjéer* *ji* 'the ginger' < Engl.?

      mecce   *mi* 'the trade'   < Fr.   *siro*   *si* 'the syrup'   < Fr.
      miskit[21] *mi* 'the biscuit'   < Engl.?   *soble* *si* 'the onion'   < Port.

      wago   *wi* 'the wagon'   < Fr.
      waliis *wi* 'the suitcase' < Fr.

Unfortunately, we cannot tell whether these are recent loans or not, other than guessing that the Portuguese and Arabic loans are probably among the older ones. There are many, many more loanwords assigned to the *b*-class, and as mentioned above, all new loans are assigned to the default class. But most significant is that other than on a phonological basis, there is no apparent reason why these nouns should be assigned to the class they are in, with the one possible exception of the Arabic loans assigned to the *j*-class, a case that is discussed in §4.5.[22]

The copy process is by far the most puzzling aspect of Wolof noun classifi-cation and one which has received a great deal of attention in the descriptive

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[21] Fal, Santos, and Doneux [1990] list this form as a variant of *mbiskit* which begins with a prenasalized bilabial stop, making it phonetically closer to the English [*b*].

[22] Two other cases of possible phonological class assignment are worth mentioning here. First is the word for 'gold' which alternates between the forms [*wurus*] and [*ʔurus*] and which falls into the *w*-class. The underlying form of this word is vowel-initial, but since Wolof requires syllable onsets, either the labiovelar glide or the glottal stop is epenthesized before back vowels. It would appear, then, that class assignment is based in this case on the epenthetic consonant. Second is the compound *jëm si yàlla* 'deceased person' (literally 'heading to God') which falls into the *j*-class even though the first morpheme in the compound is a verbal one. These two examples are based on surface phenomena, which is exactly what we would expect for a phonological basis of agreement.

literature. The fundamental formal problem posed by the copy process, if indeed it is such, is that the syntactic process of agreement appears to be carried out in the morphophonology in a process akin to reduplication, except that the copying takes place across a word boundary. Elsewhere [Mc Laughlin 1996] I have provided an account of the copy process within the framework of Autolexical syntax [Sadock 1991, Woodbury 1996] in which an expression is not required to have isomorphic or matching representations in each component of the grammar in order to be well formed. In the analysis, stem-initial consonants in Wolof nouns may be viewed as "not quite prefixes". The morphophonological component of the grammar interprets them as class prefixes, while the morphological component interprets the noun as a simplex form without a prefix.

The analysis is historically well-motivated when we consider the North Atlantic context and the evolution of noun class markers within the sub-group. Noun class markers originally developed at the left edge of the stem in the form of overt prefixes, still partially retained in Seereer-Siin. These prefixes conditioned stem-initial consonant mutation, which is still completely productive in Seereer-Siin and Pulaar, and remnants of which are retained in Wolof. With the complete disappearance of prefixes, as in Pulaar, class markers then surfaced at the right edge of the stem in the form of suffixes. For some reason, Wolof never underwent this renewal process, leaving the burden of class marking at the left edge of the stem, on the initial consonant and its various mutations. As a productive mutation system began to disappear, the locus of class marking, i.e., the left edge of the stem, was retained. The stem-initial consonant, then, became a type of vacuous class marker, based on phonological form alone, thus giving rise to the copy process.

There are many constraints on the copy process which make it a less than fully productive means of assigning class. First, the set of possible initial consonants is obviously larger than the set of possible noun classes. There is, for example, no *f*-class for nouns like *fas* 'horse' to be assigned to on the basis of the copy process.[23] In addition, the *k*-class and the *ñ*-class do not admit new words on any basis, and the *y*-class admits only plurals. Thus, hypothetical forms like **fas fi* 'the horse', **yax yi* 'the bone'[24], and **kër ki* 'the house' are ruled out.

If all the features of a stem-initial consonant cannot be copied because the resulting consonant yields an illicit class assignment, there is some evidence that the place of articulation is still copied, so that the class marker approximates the stem-initial consonant. Examples include *f* → *w*, where both consonants are labial, as in *fas wi* 'the horse' and *fel wi* 'the flea', and the velar set, *k* → *g*, as in

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[23] There is some evidence that there may have been a locative *f*-class at some point in the history of Wolof. I base this suggestion on the striking similarity of form between nominal determiners and *f*-initial locative forms such as *fii* 'here', *fale* 'there', *foofu* 'the aforementioned place', *fu* 'where [relative]' and *fan* 'where'.

[24] The form *yax yi* is, of course, a grammatical plural form, meaning 'the bones'.

kànja gi 'the okra' and the French loanwords *kubeer gi* 'lid' and *kulóor gi* 'the color'. Cases such as these tend to support the historical reality of the copy process which interprets the initial consonant of the stem as something akin to, but not exactly, a prefix.

Considering the stem-initial consonant to be "not quite a prefix" has two main advantages. First, it builds upon earlier analyses of Wolof nouns as consisting of prefix + stem, by maintaining the prefix hypothesis, but in a more plausible way. The main problem with analyses like that of Delafosse [1927] in which the initial consonant or the first syllable of Wolof nouns are considered to be class prefixes is that the resulting stem, devoid of its prefix, is at odds with the comparative data. By way of example, Delafosse cites the word for 'griot' (*géwél*) as being composed of a prefix /ge-/ and a stem /-wel/. When we examine the comparative data in (16) it seems much more likely that the three languages share a velar-initial stem.

(16) Comparison of the forms for 'griot' in the North Atlantic languages

	Singular	Plural
Wolof	*géwél*	*géwél*
Seereer-Siin	*o-kawul*	*gawul*
Pulaar	*gawlo*	*awluɓe*

The second main advantage of this account of the copy process is that it fits well with autosegmental analyses of consonant mutation which view mutation as the prefixation of a floating feature, in other words, a covert prefix.

4.3 Default class assignment. The most noticeable trend in Wolof noun classification, namely the expansion of the *b*-class, is already noted in much of the earlier literature on the language. For example, Rambaud makes two observations: "On remarque que la consonne *b* [in the context of noun classification] est beaucoup plus fréquente que les autres" [1898:12], and "La plupart des substantifs désignant des objets importés par les Européens—par suite, récemment introduits dans la langue—prennent la particule de détermination *bi*." [1898:15]. The influx of loanwords has frequently been cited as a possible cause for such an expansion, a hypothesis that undoubtedly has some validity, although, as we have already seen, loanwords in Wolof have been assigned to a variety of classes on the basis of other criteria.

Irvine [1978] offers another perspective on the expansion of the *b*-class by appealing to the sociolinguistic notion of appropriate error. In Wolof society, as in many other societies of the western Sahel, verbal behavior is a prime indicator of social status, and virtuosity in speech is associated with the casted status of griot. In order to distinguish their speech from that of the griot, upwardly

mobile, middle-aged non-casted men may use the wrong noun class as an indicator of high status, since fluency in speaking is an attribute of low social status [Irvine 1978:40].[25] In these cases, the preferred direction of appropriate error is towards the *b*-class which is the class with largest membership and also the default class. This notion of appropriate error could thus account in part for the expansion of the *b*-class since, as Irvine puts it [1978:45], 'the spread of the BI class represents a move toward the norms of high-status speaking.'[26]

While Irvine's study was conducted in a rural setting, there is no doubt that the phenomenon of Wolofization, or the spread of urban Wolof as a Senegalese lingua franca, has also contributed greatly to the expansion of the *b*-class. Urban Wolof, especially the variety spoken in Dakar, the Senegalese capital, is characterized by extensive borrowing from French, a feature that distinguishes it from "deep Wolof" (*olof bu xóot*), or the variety spoken in the Wolof heartland where Irvine's study was conducted. Urban Wolof is also spoken by many people as a second language, a factor that may also contribute to a simplification of the noun class system. The proliferation of the *b*-class is, in fact, one of the prime indicators of an urban variety of Wolof. Not only are the many nouns borrowed from French assigned to the *b*-class, but other very common nouns such as *góor* 'man' and *jigéen* 'woman' are assigned to the *b*-class in urban Wolof, instead of the *g*-class and the *j*-class, respectively. A native Wolof speaker from a rural area even reported that when he came to Dakar he put all his nouns in the *b*-class, whereas he would use the "correct" form at home. Urban attitudes towards the two varieties of Wolof probably do not play a significant role either in encouraging the spread of the *b*-class or in quelling its spread since those attitudes are ambivalent. Those who speak "deep Wolof" are considered to be *kow-kow* or "hicks", thereby having lower social prestige than urbanites, but their speech is generally admired, especially when contrasted with what urbanites generally consider to be the lamentable state of their own Wolof.

The expansion of the *b*-class is certainly not a new phenomenon which can be uniquely correlated with recent trends in the language, and it is important to note that some of the tendencies documented by Irvine for rural Wolof, and more especially those apparent in urban Wolof, merely take advantage, so to speak, of a

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[25] The notion of caste and its relationship to social status in the societies of the western Sahel has undergone much reconsideration in recent scholarship. The topic is, of course, well beyond the scope of this paper, but the interested reader is referred to the collection of essays in Conrad and Frank [1995] which deal primarily with Mande society.

[26] It should also be noted that Irvine's study deals with two opposing trends: while those who are striving for what Irvine terms higher status show a preference for appropriate error in the direction of the *b*-class, those who wish to embellish their speech may make appropriate errors in the opposite direction. In many cases, she notes, nouns assigned to the *b*-class in a large corpus of nineteenth century data, are assigned to other classes on the basis of consonant harmony, i.e., the copy process. This observation further increases the validity of the copy process as a real historical trend, rather than coincidence.

pre-existing trend, and expand it to a greater degree. In both cases, considerable variation occurs both within the speech community and within the repertoires of individual speakers. In such cases, one of the variants is almost always the *b*-class.

One important question remains, to which I have at present no answer: namely, why is the *b*-class, rather than any other, the default class? Irvine [1978:61] speculates that it may originally have had some type of semantically neutral connotation. It may also have to do with the nature of the original consonant mutation system and its progression towards the copy process, but the formulation of this hypothesis will have to await more comparative and historical work on Wolof in particular and on the North Atlantic languages in general.
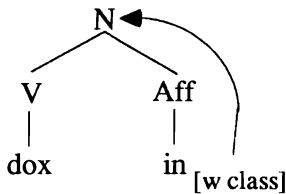
4.4 Morphological class assignment. Up to this point noun classification has been discussed only in terms of underived nouns. Derived nouns in Wolof merit some attention because they are much less likely to fall into the default class than other nouns. There are three formal productive means of noun-to-noun and verb-to-noun derivation in Wolof: stem-initial consonant mutation, suffixation, and reduplication. Examples of all three are given in (17).[27]

(17)

		V		N	
a.	Mutation	*baax*	'be good'	*mbaax*	'goodness'
		dof	'be mad'	*ndof*	'madness'
		sàcc	'rob'	*càcc*	'robbery'
b.	Reduplication	*gis*	'see'	*gisgis*	'way of seeing'
		xam	'know'	*xamxam*	'knowledge'
		bëgg	'want, love'	*bëggbëgg*	'desire'
c.	Suffixation	*bind*	'write'	*bindukaay*	'pen/pencil'
		tàng	'be hot'	*tàngaay*	'heat'
		dox	'walk'	*doxin*	'manner of walking'

These derivational processes entail the assignment of the nouns to a specific noun class. For example, the manner suffix, /-in/, assigns a noun to the *w*-class, and those involving consonant mutation are generally assigned to the *g*-class. In such cases, the derivational affix, which is the morphological head of the noun, is lexically specified for class and assigns that class to the noun, as illustrated in (18) for the example *doxin* in (17c).

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[27] These processes may also be combined in verb to noun and verb to verb derivation. See Ka [1994:132-3] for some examples.

(18)

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              N◄
           /     \
          /       \
         V        Aff   \
         |         |     |
        dox       in     /
                     [w class]
```

Such nouns are much more resistant to being assigned to the *b*-class on a default basis than are non-derived nouns, and much less variation occurs in their noun class assignment. These factors may ultimately constrain the spread of the *b*-class, at least to certain areas of the lexicon.

4.5 Some problems with Arabic loans. As a final note to the discussion of class assignment, the case of Arabic loanwords, of which there are many in Wolof, merits some assessment. Two different trends in the assignment of Arabic loanwords to a class can be discerned in the written sources and in the speech of contemporary Wolof speakers. First is the assignment of such loans to the *j*-class, and second is their assignment to a class based on the copy process.

Ndiaye [1949], in a short article on Arabic loans,[28] remarks on the fact that a large percentage of them are assigned to the *j*-class and offers an interesting explanation for the fact. She says that their assignment builds on the semantic content of the *j*-class which, as we have seen in §4.1, includes family members of maternal descent. Ndiaye, a native speaker of Wolof, expands this semantic field to include the notion of fecundity or the ability to produce (hence the maternal link), which she in turn extends to the notion of mystical fecundity in the following explanation:

> De <<faculté de produire>> on est passé, entre autres, au sens <<fécondité mystique>>: sous cette rubrique se classent les noms arabes (ou cultuels), car je suis persuadée que l'arabe est encore, mais fut surtout à l'origine pour les Wolofs, une langue magique: tous les premiers emprunts qui lui furent faits le furent pour les besoins de l'incantation, du cérémonial ou de l'enseignement sacré. [Ndiaye 1949:113ft]

Ndiaye's reasoning, whether verifiable or not, is a good example of what Lakoff [1987] terms the 'myth-and-belief principle' in noun classification, given below:

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[28] Ndiaye's list of Arabic loans was intended as a supplement of sorts to Mouradian [1940], and is thus quite limited in scope. Unfortunately, even though he gives quite an extensive list of Arabic loans, Mouradian does not supply their noun class.

> If some noun has characteristic X (on the basis of which its class
> membership is to be decided) but is, through belief or myth, connected
> with characteristic Y, then generally it will belong to the class corres-
> ponding to Y and not that corresponding to X. [Lakoff 1987:94]

For nouns borrowed from Arabic, then, the shape, size, or other intangible
attributes of the objects or concepts they denote would be secondary to the fact
that they have a magical or religious association by mere virtue of the fact that
they are from Arabic.

Another possibility for the tendency of Arabic loans to fall into the *j*-class is
that many of them entered Wolof through Pulaar, via extensive Islamic prosely-
tizing on the part of the Tukuloor people or Haalpulaar'en of northern Senegal,
and are thus secondhand loans. The singular default class in Pulaar requires no
class suffix, but the plural default class, into which most Arabic loans fall,
requires a class suffix of the shape /-ji/, as the following examples show.

(19)   Pulaar loanwords from Arabic and Wolof cognates

Pulaar			Wolof	
Singular	Plural	Gloss		Class
aljanna	*aljannaaji*	'paradise'	*àjjana*	*ji*
alla	*allaaji*	'god'	*yàlla*	*ji*
ataaya	*ataayaaji*	'tea'	*attaaya*	*ji*
jamaanu	*jamanuuji*	'epoch'	*jamano*	*ji*
jumaa	*jumaaji*	'mosque'	*jumaa*	*ji*

Whether this peculiarity of Pulaar morphology had any influence on Wolof class
assignment is debatable, but the examples are worth mentioning. As with all the
other cases of class assignment that we have seen, this explanation would only
account for a subset of nouns assigned to the *j*-class, since there are many
exceptions, including Arabic loans in Pulaar which do not take the /-ji/ suffix, but
which are nonetheless assigned to the *j*-class in Wolof.

Rambaud [1898:16] lists the Arabic loans in (20) as being assigned to their
respective classes on the basis of the copy process, and those in (21) as being in
the *b*-class.

	Rambaud's orthography	Standard Wolof orthography	Gloss
(20)	*kélifa gi*	*kélifa*	'leader'
	gélèm gi	*gëléem*	'camel'
	sèïtané si	*seytaane*	'devil'
	sokhla si	*soxla*	'need'
	saha si	*saa*	'moment'
	malaka mi	*malaaka*	'angel'
(21)	*dérèm bi*	*dërëm*	'five franc piece'
	sarakha bi	*sarax*	'alms'
	alkoranu bi	*alxuraan*	'the Qur'an'
	khaftân bi	*xaftaan*	'caftan'

When we consider this small sample of Rambaud's loans, what we find in modern Wolof is that those assigned to a class on the basis of the copy process are still grammatical, although individual speakers may show variation between those forms and *b*-class forms. When we compare those examples in (21) to modern Wolof, we find that two of the four nouns are more commonly assigned to other classes, although they can still alternate with the *b*-class, especially in urban Wolof. The examples are the words for 'alms', *sarax si*, which Rambaud lists as being in the *b*-class, but is now found in the *s*-class, an illustration of the copy process at work; and the word for the 'Qur'an' *alxuraan ji*, now in the *j*-class as opposed to Rambaud's listing of the *b*-class. These two examples show the competing trends that Irvine discerned, towards and away from the *b*-class. They also show that three processes of class assignment, namely the copy process, the semantic assignment of words associated with Islam to the *j*-class, and the tendency towards a default *b*-class, have all been productive at least in the past hundred year period.

5.0 Conclusion

The aims of this article have been to examine Wolof noun classification in the comparative context of its two closest sister languages, Seereer-Siin and Pulaar, to see if some conclusion might be reached about why the noun class system is tending towards a default, and also to see if noun classification in Wolof can tell us anything about noun classification in general.

With regard to the first aim, and to recapitulate, Wolof differs from its sister languages in that the disappearance of a class prefix did not entail its replacement by suffixation. This single but extremely important factor gave rise to a lack of class marking on the noun, other than in vestigial cases of consonant mutation, thereby making agreement much more difficult than in languages like Pulaar or

Seereer-Siin where nouns are doubly marked for class. Certain strategies in addition to semantic ones were developed in order to assign nouns to a class, namely the copy process and the expansion of the default class.

What, to address the second aim, does the Wolof noun class system tell us about noun classification in general? On the surface, it tells us that there is more than one way to classify a noun, and that classification systems may well incorporate a variety of different and intersecting parameters, namely semantic, morphological, and even phonological and sociolinguistic parameters. The Wolof noun classification system, rather than being the result (in both a diachronic and a synchronic sense) of a single means of classification, shows evidence of several, sometimes competing, means of classification. When two classification strategies compete or overlap, they may be rank-ordered, or variation may occur.

This hybrid system raises some serious questions about how linguists have approached noun classification. To assume that current systems of noun classification are merely imperfect remnants of once perfect, or at least more perfect, systems, seems to me to be an untenable position. The first question that comes to mind is "Why have all the perfect noun class systems disappeared?" As mentioned in §4.1, one aim at a solution is Lakoff's approach of experiential realism[29] which seeks to rethink the nature of cognitive categories to show that human categories are an artifact of the human mind rather than the external world. But where would a phenomenon like the Wolof copy process fit into such a schema? By way of an answer, I would like to offer the suggestion that noun class systems are not only an artifact of human cognition, but they are also an artifact of human language. As we have seen, morphological change has played an enormous role in the shape of the Wolof noun class system, leading ultimately to a phonological basis of categorization which has nothing to do with semantic categorization.

The Wolof case offers a somewhat bewildering array of classification parameters, all of which intersect in a viable system. The fact that the Wolof noun class system, and other equally hybrid systems, are viable ones, points to the possibility that earlier noun class systems did not have to be qualitatively different from extant ones, but that they, too, involved a multiplicity of overlapping classification strategies based not only on semantic categories or artifacts of the human mind, but on linguistic categories or artifacts of human language.

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[29] Several studies in a similar vein are to be found in Craig [1986].

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THE CLASSIFICATION OF THE
MASA GROUP OF LANGUAGES*

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The Chadic family of languages comprises approximately 140 languages
classified into three major branches: West Chadic, Biu-Mandara, and East Chadic.
Newman [1977b] has proposed an additional, fourth branch of Chadic consisting
of the Masa group of languages, previously classified in the Biu-Mandara branch.
This article provides supporting evidence for Newman's classification of the Masa
group as a fourth branch by demonstrating that this group does not exhibit the
phonological, lexical, and morphological innovations characteristic of the Biu-
Mandara branch. It follows from the absence of these innovations that there is no
evidence for the classification of the Masa group in the Biu-Mandara branch.

1. Introduction

Chadic languages, of which there are approximately 140, are spoken in southern
Niger, northern Nigeria, northern Cameroon, and western and central Chad
[Newman 1977b, 1990, 1992]. Since the first comprehensive classification of these
languages [Greenberg 1963], there has been considerable disagreement in the
literature about the internal subclassification of Chadic. Currently, there is a
consensus that the Chadic family is composed of three major branches: West
Chadic, Biu-Mandara or Central Chadic, and East Chadic [Newman 1977b, 1992;
Jungraithmayr and Shimizu 1981; Jungraithmayr and Ibriszimow 1994]. However,
Newman [1977b] has proposed an additional, fourth branch of Chadic consisting of
the Masa group of languages. This group was previously classified in the Biu-
Mandara branch of the family [Hoffmann 1971, Newman 1978]. In response to
Newman's proposal, Tourneux [1990] presented evidence in support of the

subgrouping of Masa in Biu-Mandara. This subclassification has been maintained by Jungraithmayr [1981], Jungraithmayr and Shimizu [1981], Barreteau [1987], and Jungraithmayr and Ibriszimow [1994] in their studies of the Chadic family.

In this paper I provide supporting evidence for the classification of the Masa group as a fourth branch of the Chadic family. I demonstrate that the Masa group does not exhibit the phonological, lexical, and morphological innovations characteristic of the Biu-Mandara branch. It follows from the absence of these innovations that there is no evidence for the subclassification of this group in Biu-Mandara. Thus, I conclude that the Chadic family is composed of four branches as proposed by Newman [1977b].
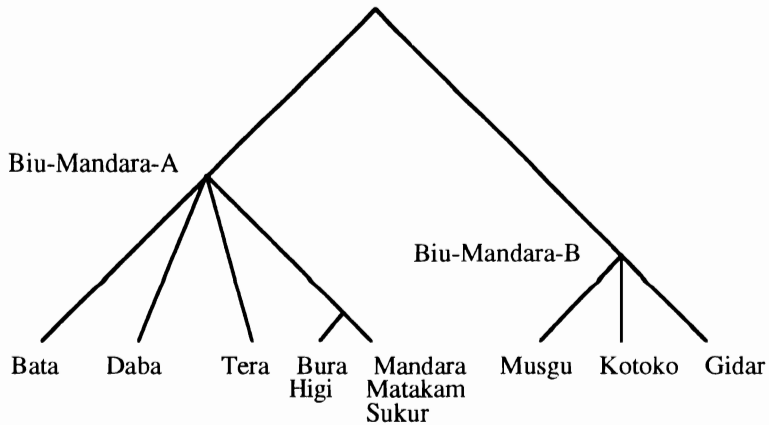
The paper is organized as follows. In section 2 I present an overview of the Chadic family. I outline the internal composition and subclassification of the Biu-Mandara languages and the languages of the Masa group. I then summarize the major classifications of the Chadic languages in section 3. The principal arguments regarding the position of the Masa group in the Chadic family are also considered. In sections 4 through 6, I present several phonological, lexical, and morphological innovations of the Biu-Mandara branch and demonstrate that these innovations are not attested in the Masa group of languages. I provide an appendix containing a list of 204 words reconstructed for the Proto-Masa group in order to substantiate the arguments presented in this paper as well as to encourage further comparative research.

2. The Chadic family

As noted above, the Chadic family consists of three major branches: West Chadic, Biu-Mandara, and East Chadic [Newman 1977b, 1990, 1992]. In the West Chadic branch there are approximately 64 languages spoken primarily in northern and northwestern Nigeria. Hausa, the predominant Chadic language, belongs to the West Chadic branch. Hausa has over 40 million speakers located primarily in northern Nigeria but it extends west and north into Niger. The languages of the Biu-Mandara branch are spoken in northeastern Nigeria, northern Cameroon, and westernmost Chad. There are at least 68 languages in this branch. The estimated 30 languages comprising the East Chadic branch are spoken primarily in western and central Chad. Finally, the Masa group is composed of nine closely related languages spoken along the border of northern Cameroon and southwestern Chad. In the remainder of this section, I outline in more depth the composition and internal classification of the Biu-Mandara branch and the Masa group.

2.1. Biu-Mandara. The internal classification of the Biu-Mandara branch (BM) is schematized in (1) following Newman [1977b]. According to Newman, Biu-Mandara is comprised of two subbranches, 'A' and 'B'. The Biu-Mandara-A subbranch (BM-A) is comprised of eight groups. The Biu-Mandara-B subbranch (BM-B) includes the Musgu, Kotoko, and Gidar groups.

(1) The Biu-Mandara branch

Biu-Mandara-A

Biu-Mandara-B

Bata   Daba   Tera   Bura   Mandara   Musgu   Kotoko   Gidar
                          Higi   Matakam
   Sukur

In Newman's 1990 classification of the Chadic languages, the Gidar group is subclassified as a separate, third subbranch in Biu-Mandara. The innovations presented for the Biu-Mandara-B subbranch in this paper hold for the Gidar group as well as the Musgu and Kotoko groups. Since the position of Gidar as a third subbranch may be questioned, I follow Newman's 1977b subclassification of Biu-Mandara into two branches. Regardless of the position of Gidar in the Biu-Mandara branch, the principal argument of this paper remains the same: the Masa group of languages does not exhibit the innovations characteristic of the Biu-Mandara languages.

2.2. The Masa group. The Masa group consists of nine closely related languages spoken in southwestern Chad and contiguous regions of northern Cameroon. The languages comprising the group are subclassified into two subgroups, 'north' and 'south' [Dieu and Renaud 1983, Tourneux 1990]. The northern subgroup consists of Masa, Musey, Marba, and Monogoy [Barreteau 1987, Tourneux 1990]; the southern subgroup of Zime (Mesme), Peve, Heɗe, and Ngiɗe [Jungraithmayr 1978a, Hufnagel 1986, Noss 1990]. Zumaya is provisionally classified as separate from these principal subgroups following Barreteau [1987]. The internal subclassification of the group is summarized in (2).

As noted above, the northern subgroup consists of Masa, Musey, Marba, and Monogoy. Masa has approximately 180,000 speakers situated in the Mayo-Kebbi prefecture of southwestern Chad and in northern Cameroon in the Mayo-Danay Division of the Far North Province [Caïtucoli 1983]. There are approximately 150,000 speakers of Musey [Platiel 1968; R. Duncanson, p.c.], of whom approximately 120,000 live in the Mayo-Kebbi prefecture situated between Fianga and Kelo, the remaining 30,000 in the Mayo-Danay Division of the Far North Province in Cameroon. The approximately 80,000 speakers of Marba, also known

as Azumeina [Price 1968], reside primarily in the Mayo-Kebbi prefecture, north of Kelo. Finally, Monogoy has an estimated 5,000 speakers located in the Mayo-Kebbi prefecture northwest of Kelo [R. Duncanson, p.c.]. The Marba and Monogoy are culturally distinct groups, but linguistically they may be similar enough to warrant being classified as dialects of a single language [R. Duncanson, p.c.; S. Lazicki, p.c.].

(2) The languages of the Masa group
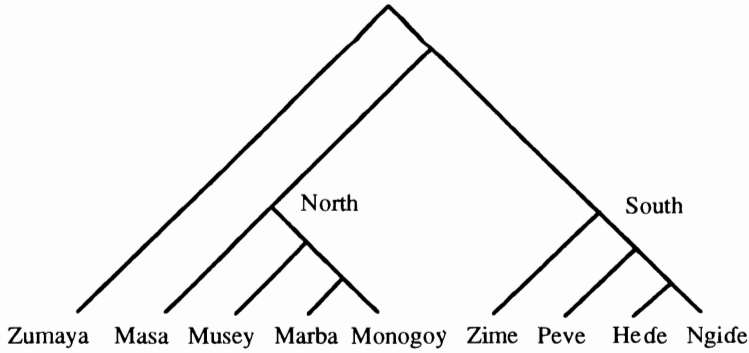
(3) Map for Masa, Musey, Marba, and Monogoy
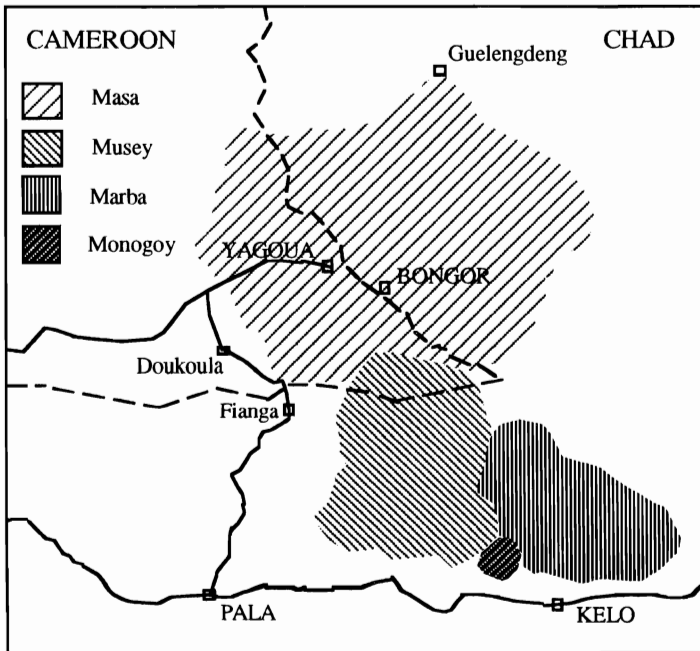
The southern subgroup consists of Zime (Mesme), Peve, Heɗe, and Ngiɗe [Jungraithmayr 1978a, Hufnagel 1986, Noss 1990]. Zime, which has an estimated 30,000 speakers [Hufnagel 1986, Kieschke 1990, Noss 1990], is spoken in the Mayo-Kebbi prefecture, immediately east of Kelo, Chad. Peve is also spoken in the Mayo-Kebbi prefecture, west of Pala in a region which extends into the neighboring area of Cameroon. It has approximately 30,000 speakers [Venberg 1975]. Heɗe, with an estimated 35,000 speakers [Noss 1990], is spoken in an area to the immediate east of the Peve speaking area [Hufnagel 1986, Noss 1990]. Lamé or Dzəpaw is the southernmost dialect of Heɗe, spoken in Cameroon east of the Bouba Njidda National Forest Reserve [Sachnine 1982]. Finally, Ngiɗe is spoken to the east of Pala and has an estimated 5,000 speakers [Noss 1990; R. Duncanson, p.c.]. Heɗe and Ngiɗe are the most closely related members of the southern subgroup. Noss [1990] has questioned the status of Ngiɗe as a language separate from Heɗe, but also notes that the Ngiɗe people consider themselves culturally and linguistically distinct.

(4) Map for Zime, Peve, Heɗe, and Ngiɗe
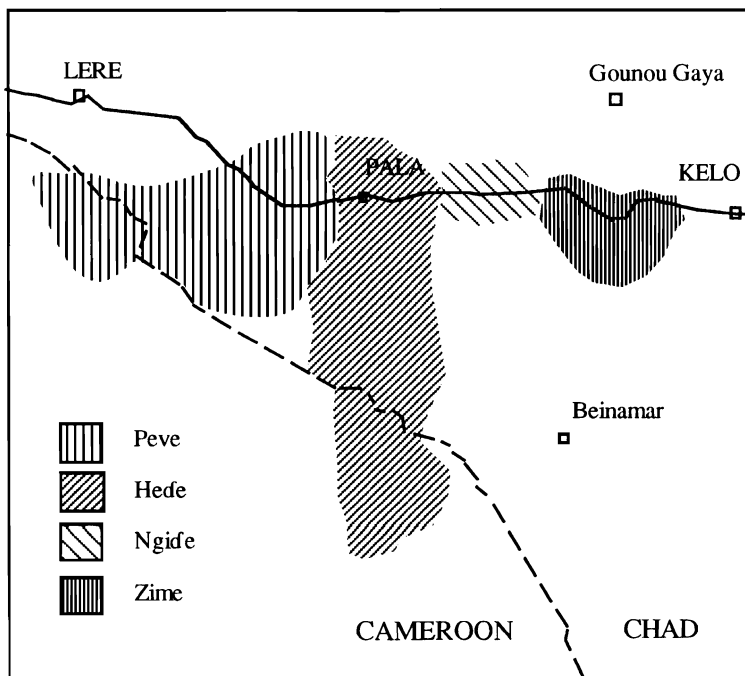
Zumaya has only a few remaining speakers [Barreteau 1987]. Its classification in the group is unclear because the language has not been well documented.

3. Overview of Chadic classification

3.1. Classifications of the Chadic languages. Greenberg [1963] put forward the first comprehensive classification of the languages of the Chadic family, classifying the languages in nine groups and demonstrating their unity as a family. Newman and Ma's [1966] in-depth comparative study of the Chadic languages demonstrated more conclusively the genetic unity of the family. They also provided evidence for the subclassification of four of Greenberg's nine groups. They classified groups 1 and 9 as a single subgroup which they referred to as "Plateau-Sahel" and groups 3 and 6 as a second subgroup referred to as "Biu-Mandara". Hoffmann [1971] placed the remaining five groups of Greenberg [1963] in Newman and Ma's "Biu-Mandara", thereby classifying all the Chadic languages into two major branches. Subsequently, in 1974, Newman [1978] proposed that Plateau-Sahel be split into two separate branches coordinate with the Biu-Mandara branch, introducing the terms "West Chadic" and "East Chadic" to refer to the two groups comprising the Plateau-Sahel branch, formerly Greenberg's groups 1 and 9, respectively. Finally, Newman [1977b] proposed that the Masa group of languages constitutes a fourth branch of Chadic, coordinate with the other three major branches. The Masa group corresponds to Greenberg's group 8 and was previously classified as part of the Biu-Mandara branch [Hoffmann 1971, Newman 1978]. These classifications are summarized in (5).

(5) The major classifications of the Chadic languages

Greenberg [1963]	1	9	3 & 6	2, 4, 5, & 7	8
Newman & Ma [1966]	Plateau-Sahel		Biu-Mandara		
Hoffmann [1971]	Plateau-Sahel		Biu-Mandara		
Newman [1978]	West	East	Biu-Mandara		
Newman [1977b]	West	East	Biu-Mandara		Masa

3.2. Classification of the Masa group and Musgu. The Masa group of languages has been considered to be closely related to Musgu, a Biu-Mandara language [Westermann and Bryan 1952, Meyer-Bahlberg 1972, Caprile and Jungraithmayr 1973]. The close relationship between these languages appears to be based primarily on the geographic proximity of Musgu and the Masa language as well as on typological and lexical similarities between these two languages. Meyer-Bahlberg [1972], for instance, noted similarities between Musgu and Masa in the manner in which they form various syntactic constructions such as relative clauses and comparatives. Furthermore, she noted lexical and grammatical resemblances between the languages.

Despite the similarities reported between Masa and Musgu, Greenberg [1963] classified Masa and the other languages of the Masa group as a distinct group from Musgu, in groups 8 and 7, respectively. Newman and Ma [1966] did not place the Masa and Musgu groups with any of the other groups in their classification of Chadic, leaving both outside the Plateau-Sahel and Biu-Mandara groups. As noted above, Hoffmann [1971] then classified the Masa group and Musgu together as part of the Biu-Mandara branch, while Caprile and Jungraithmayr [1973] classified them as a single group. In a later classification, Newman [1978] distinguished two subbranches of the Biu-Mandara branch, designated 'A' and 'B', and, in keeping with the consensus of a close genetic relationship, he placed the Masa group and Musgu in the same subbranch, Biu-Mandara-B.

In 1977, Newman rejected the conventional acceptance of a close relation between the Masa group and Musgu, proposing instead that the Masa group be removed from the Biu-Mandara branch and provisionally classified as a fourth branch of Chadic. He noted that the primary argument for removing the Masa group from Biu-Mandara was that the Masa group does not exhibit the sound change Proto-Chadic *S > *ɬ characteristic of the Biu-Mandara branch [Newman 1977a,b]. *S represents a sibilant distinct from Proto-Chadic *s, possibly [ʃ]. Furthermore, Newman noted that he could not find any features of the Masa group which would justify its subclassification in the West or East Chadic branches. Consequently, he provisionally classified the group as a separate branch. It is important to note that Newman's subclassification was based on the identification of shared innovations. In the absence of shared innovations among languages or language groups, no subclassification can be inferred.

In response to Newman [1977b], Tourneux [1990] argued for the subclassification of the Masa group as part of Biu-Mandara-B. Tourneux noted three sound correspondences characteristic of the Masa group: Proto-Chadic *ṣ corresponds to [s], Proto-Chadic *r to [l], and Proto-Chadic *d to [r] in intervocalic position. Note that Tourneaux's Proto-Chadic *ṣ is equivalent to Newman's Proto-Chadic *S. Tourneux compared these correspondences with other Chadic languages and, specifically, with Musgu. He observed that these sound correspondences occur elsewhere in the Chadic family and, more importantly, in Musgu. However, the fact that the Masa group and Musgu share these sound correspondences does not mean that these languages should be subclassified in the same branch of the family. Tourneux illustrated this point well by demonstrating the prevalence of these sound correspondences in other branches of Chadic. If it could be shown that the Masa group and Musgu underwent these sound changes at a similar point in their history, then these correspondences could possibly be phonological innovations indicating a period of common ancestry. Tourneux did not address the relative chronology of these sound changes. In section 4, I show that these sound correspondences represent sound changes which occurred independently in the Masa group and Biu-Mandara.

Tourneux also presented the findings of a lexico-statistical comparison of Musgu and four of the languages of the Masa group based on a modified Swadesh list. This comparison revealed that the Masa group languages exhibited from 37 to 41% cognancy with Musgu. Tourneux suggested that these figures indicated that the Masa group and Musgu are more closely related than Newman's subclassification recognizes. He suggested, moreover, that these findings argue for the subclassifi-cation of the Masa group as a group within Biu-Mandara. In support of this proposal, Tourneux noted that the languages of the Matakam group, a group in the A sub-branch of Biu-Mandara, share from 32% to 68% of their vocabulary. Tourneux suggested that since the Masa group and Musgu share approximately 40% of their vocabulary, it follows that the genetic relation between these languages is comparable to that noted for the languages of the Matakam group. It is not the case, however, that the percentage of cognate vocabulary represents an absolute figure with which to determine degree of subclassification. Moreover, the identification of shared innovations remains the principal method of subclassification.

In the remainder of this paper, I present several phonological, lexical, and morphological innovations characteristic of the Biu-Mandara branch and the Biu-Mandara-B sub-branch. I demonstrate that the Masa group of languages consistently does not share the innovations of the Biu-Mandara branch. In the absence of shared innovations, there is no evidence for the subclassification of the Masa group of languages within Biu-Mandara. Thus, the absence of the Biu-Mandara innovations in the Masa group supports Newman's proposal that the Masa group should be classified as a separate, fourth branch of Chadic.

4. Phonological Innovations

In this section, I present four historical sound changes which affected the Biu-Mandara languages. Two of the sound changes affected Biu-Mandara and distinguish this branch from the East and West Chadic branches. The two remaining changes affected the B subbranch of Biu-Mandara but not the A subbranch. After considering these sound changes in Biu-Mandara, I consider the corresponding historical developments in the Masa group. I demonstrate that the Masa group did not undergo the sound changes reconstructed for Biu-Mandara.

4.1. Sound changes affecting Proto-Biu-Mandara. There are two well-documented sound changes which affected Proto-Biu-Mandara (Proto-BM): Proto-Chadic *b > Proto-BM *v and Proto-Chadic *S > Proto-BM *ɬ [Newman 1977a,b] The first of these changes is illustrated in (6). The Proto-Chadic reconstructions presented in (6) and in subsequent discussions are from Newman [1977b]. See Appendix A for a list of language abbreviations.

(6)   Proto-Chadic *b > Proto-BM *v

Proto-Chadic		BM-B	BM-A
*bar	'blood'	Mg *fel*	J *vara*
*barə	'to give'	Lo *vá*, G *ə+vaya*	T *vərə*
*zaban	'guinea-fowl'	Lo *záawan*, G *zamvəna*	Gs *tsuvoŋ*
*bədi	'night'	Lo *vaɗe*	Db *vuɗu*

The second sound change, Proto-Chadic *S > Proto-BM *ɬ, is of particular interest because a change of this nature only occurred in Biu-Mandara [Newman 1977a,b]. This sound change is illustrated in (7). As noted earlier, Proto-Chadic *S represents a sibilant distinct from Proto-Chadic *s.

(7)   Proto-Chadic *S > Proto-BM *ɬ

Proto-Chadic		BM-B	BM-A
*'JaSu	'bone'	Lo *aɬe*, G *ɬèŋɬéŋ*	T *'geɬ*
*Səmi	'ear'	Mg *ɬime*, G *ɬə̀má*	Hi *ʄəme*
*Səm	'name'	Lo *ɬemi*	M *ɬəm*
*San(-)	'tooth'	Lo *ɬan*, G *ɬaya*	Pd *ɬira*

4.2. Sound changes affecting Proto-Biu-Mandara-B. Two sound changes which affected Proto-Biu-Mandara-B include: Proto-Chadic *r > Proto-BM *r > Proto-BM-B *l and Proto-Chadic *d > Proto-BM *d > Proto-BM-B *r / V_ V. The first of these changes is illustrated in (8).

(8)   Proto-BM *r > Proto-BM-B *l

Proto-Chadic		BM-B	BM-A
*kərfi	'fish'	Mg *kilif*, G *kilfi*	T *yurvu*
*pərə	'to fly'	Mg *afili*, Lo *pelace*	
*təra	'moon'	Mg *tile*, G *təla*	Mn *tərə*
*xərə	'to steal'	Mg *hala*, G *ə+hala*	Gd *xərə*

The sound change Proto-Chadic *r > *l applied to a significant number of Biu-Mandara-A languages. This sound change, however, cannot be reconstructed for Proto-BM-A. The sound change affected the Bura/Higi, Mandara, Matakam, and Daba groups of Biu-Mandara-A. It did not arise in the Tera and Bacama groups. As seen in (1) above, Bura/Higi, Mandara, Sukur, and Matakam belong to a single subbranch of Biu-Mandara-A. The Daba, Tera, and Bacama groups constitute three separate subbranches. Thus, the change occurred in two of the four subbranches of Biu-Mandara-A. The distribution of this sound change suggests that it occurred independently in these two subgroups after the split of Proto-BM-A.

The second sound change affecting Biu-Mandara-B was Proto-Chadic *d > Proto-BM *d > Proto-BM-B *r / V_ V. This sound change is illustrated (9).

(9) Proto-BM *d > Proto-BM-B *r / V_ V

	Proto-Chadic		BM-B	BM-A
*kədəm	'crocodile'		Mg *kurum*	Mn *cərwə*
*idə	'eye'		Bu *yil*, Mg *arai*	Mt *di*
*bədi	'monkey'		Mg *ávrìk*, G *bərya*	Lng *vəji*

In Biu-Mandara-A, the Daba and Matakam groups exhibit this sound change. Several languages of the Bura group, including Kilba and Margi, also underwent this change. In the majority of the groups in Biu-Mandara-A, though, Proto-Chadic *d did not change to *r intervocalically.

4.3. Sound changes in the Masa group. Three sound changes reconstructed for the Proto-Masa group (Proto-MG) are of interest here: Proto-Chadic *b > Proto-MG *v, Proto-Chadic *S > Proto-MG *s, and Proto-Chadic *d > Proto-MG *r / V_V. These sound changes are illustrated in the following tables.

(10) Proto-Chadic *b > Proto-MG *v

Proto-Chadic		Masa group
*bar	'blood'	P *vūsū*, H *vursu*, Z *vursu*
*bədi	'monkey'	Ma *vìì+rà*, Mb *vi+ra*, H *vir*, Z *vir*
*ba	'mouth'	Ma *vùn+nà*, P *vūn*, H *vùn*, Z *vin*

(11) Proto-Chadic *S > Proto-MG *s

Proto-Chadic		Masa group
*'JaSu	'bone'	Ma *zòk+ŋā*, Mu *sōk+ŋà*, P *ùsō*, H *uso*
*aSi	'egg'	Mu *sē+nà*, Mb *asse+na*, N *ʃeʔ*
*Səm	'name'	Ma *sēm+nā*, Mu *sēm+má*, Z *sem*
*Sənə	'to send'	Mb *sun*, P *ʃin*, H *sin*, N *sin*

(12) Proto-Chadic *d > Proto-MG *r / V_V

Proto-Chadic		Masa group
*idə	'eye'	Mu *ìì+rà*, Mb *ir+a*, P *ī̀*, H *ir*, Z *ir*
*kədəm	'crocodile'	Mu *hūrùm+mà*, P *hūrūm*, H *hurum*, N *hūrūm*
*bədi	'monkey'	Ma *vìì+rà*, Mb *vi+ra*, H *vir*, Z *vir*

The change Proto-Chadic *d > *r / V_V brought about a phonological contrast between *ɾ, a flap, and *r, a trill, in Proto-MG. The Proto-MG *ɾ is the reflex of Proto-Chadic *r whereas the Proto-MG *r is the reflex of Proto-Chadic intervocalic *d. After the split of Proto-Masa group into the northern and southern subgroups, the contrast between the two r's was independently lost in both subgroups. In the southern languages the *ɾ merged with the *r; but in the northern languages, *ɾ merged with *l. Note the correspondences in (13) for Proto-MG *ɾ in contrast to the reflexes of Proto-MG *r and *l seen in (14) and (15).

(13) Proto-MG *ɾ > *l in northern subgroup, *r in southern subgroup

Proto-Chadic	Proto-MG		North	South
*kərfi	*k-ɾf-	'fish'	Ma *kūlùf+nà*	N *kérfé*
*təra	*tiɾ	'moon'	Ma *tīl+tā*	P *cēr*, Z *ter*
*mar	*mbuɾ	'oil'	Mu *mbùl+lã̀*	H *mbur*

(14) Proto-MG *r > *r

Proto-Chadic	Proto-MG		North	South
*kədəm	*hurum	'crocodile'	Mu *hūrùm+mà*	P *hūrūm*
*idə	*ir	'eye'	Mb *ir+a*	H *ir*, Z *ir*
*bədi	*vir	'monkey'	Ma *vìì+rà*	H *vir*, Z *vir*

(15) Proto-MG *l > *l

Proto-Chadic	Proto-MG		North	South
	*gol	'to watch'	Mu *gol*	H *gól*
	*gulok	'rooster'	Mu *gògòlók+ŋā*	P *gùlòk*
	*wile	'to shine, flash'	Mb *wile+da*	L *wileʔe*
	*sal	'to wash grain'	Mu *sal*	H *sal*

It is a common characteristic of languages in this area of Africa to distinguish a trill, flap, and voiced lateral. Hausa, Ngizim, and Kanuri (Nilo-Saharan), for instance, exhibit such an inventory of liquids. It is interesting to note that in the Bade group of West Chadic languages, the flap has undergone sound changes in Gashua Bade and Western Bade which are very similar to the sound changes reconstructed for the Masa group. As illustrated in (16), the Proto-Bade flap *ɾ has undergone the change *ɾ > *l in Gashua Bade, but *ɾ > *r in Western Bade. The flap *ɾ remains a flap in Ngizim . The Proto-Bade *r persists as a trill in the three languages [Schuh 1981a, b; p.c.].

(16) Reflexes of Proto-Bade *r and *r

Proto-Bade	Ngizim	Gashua Bade	Western Bade	
*ɾ	ɾə̀vək	àlə̀vək	àrvàkə̂n	'skin'
*ɾ	màɾíi	mə̀lí	mə̀rə̂n	'beard'
*ɾ	zə̀gə́ɾ	ə̀zgə́l	àzgə̀rə̂n	'foot'
*r	bə́rbə̀r	bə́rbə̀r	bə́rbə̀rə́n	'dust'
*r	ákúrnà	ákúrnà	ákúrnấn	'gruel'
*r	wûrʃí	wûrʃí	wúrʃí	'scorpion'

4.4. Historical Inferences. If the Masa group were a member of Biu-Mandara-B, it would follow that this group of languages would exhibit the phonological innovations characteristic of both Biu-Mandara and Biu-Mandara-B. As noted above, there are four well-attested sound changes which affected Proto-BM and Proto-BM-B. In this section, I argue that only one of these sound changes could have affected Proto-MG. I demonstrate that the other three sound changes which affected the Biu-Mandara languages are not the same sound changes as those which affected Proto-MG.

First, as previously discussed, Proto-BM and Proto-MG exhibit the sound change Proto-Chadic *b > *v. The fact that the Masa group and Biu-Mandara share this sound change may indicate that the Masa group is a subgroup in Biu-Mandara. However, the change *b > *v has occurred independently elsewhere in the Chadic family. The Zaar, Ron, and Bade groups of West Chadic, for instance, independently underwent this change. In the case of the Ron group, there was apparently subsequent devoicing of the labial fricative. These sound changes are illustrated in (17) for Zaar of the Zaar group [Shimizu 1978], Fyer of the Ron group [Jungraithmayr 1968, 1970], and Ngizim of the Bade group [Schuh 1981a].

(17) Proto-Chadic *b > *v in West Chadic

Proto-Chadic		Zaar	Fyer	Ngizim
*bədi	'monkey'	vwùrì	fùr	və̀ʃíi
*barə	'to give'	vùrtʊ	fà	
*bən-	'hut, house'	vìn	fen	
*badə	'five'			vàaɗ
*bəna	'to wash oneself'			vìyú

The fact that this sound change has occurred independently in three separate groups indicates that this is a common change in the Chadic family. Thus, the fact that the Biu-Mandara and Masa group languages exhibit this change may be attributed to the prevalence of this change in the Chadic family.

Newman [1977b] proposes that the Proto-Chadic inventory of sibilants and laterals includes *s, *z, *S, and *ɬ. As noted earlier, Proto-BM underwent the

sound change Proto-Chadic *S > Proto-BM *ɬ. In other words, Proto-Chadic *S merged with Proto-Chadic *ɬ in Proto-BM. In Proto-MG, however, Proto-Chadic *S merged with Proto-Chadic *s. As Newman [1977b] first noted, the merger of Proto-Chadic *S with Proto-Chadic *s provides strong evidence against classification of the Masa group as a subgroup of Biu-Mandara. It is not plausible that the merger of the Proto-Chadic *S and *ɬ characteristic of Biu-Mandara could subsequently be reversed in the Masa group, with the reflexes of Proto-Chadic *S shifting to *s.
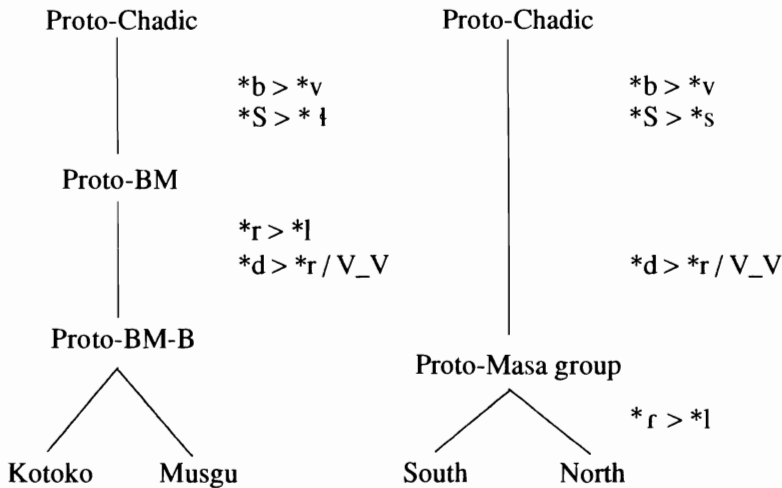
After the split of Proto-BM into its two subbranches, the change Proto-BM *r > *l affected Proto-BM-B. After Masa group split into its two subgroups, the sound change (Proto-Chadic *r >) Proto-Masa *r > *l applied to the languages of the northern subgroup. As a result, there are superficial similarities between cognates in the northern subgroup and Biu-Mandara-B, e.g., [kūlùf+nà] 'fish' in Masa and [kilif] in Musgu and [kilfi] in Gidar. Nonetheless, this sound change in the northern subgroup of Masa was a development independent of the sound change noted for Proto-BM-B.

In the last case to be considered, the sound change *d > *r / V_ V affected Proto-BM-B and the Proto-Masa group. In Proto-BM-B, this sound change followed the sound change Proto-BM *r > *l. As just noted, the sound change *r > *l did not apply to Proto-MG. It follows that the sound change *d > *r / V_V could not have applied to Proto-BM-B and Proto-MG at the same point in time. If this sound change had applied to Proto-BM-B and Proto-MG at the same point in time, Proto-MG would necessarily exhibit the prior sound change of Proto-BM *r > *l.

These sound changes and their relative chronologies are summarized in (18). On the left, note the two sound changes affecting Proto-BM after the breakup of Proto-Chadic: Proto-Chadic *b > *v and Proto-Chadic *S > *ɬ. After the split of Proto-BM, two changes affected Proto-BM-B: Proto-BM *r > *l and Proto-BM *d > *r / V_V. On the right, three sound changes affected the Proto-Masa group after the breakup of Proto-Chadic: Proto-Chadic *b > *v, Proto-Chadic *S > *s, and Proto-Chadic *d > *r (reconstructed as a trill) / V_V. Finally, after the Proto-Masa group split into the northern and southern subgroups, the northern subgroup underwent the change *r > *l.

In summary, there is one shared phonological innovation which could support the subclassification of the Masa group within Biu-Mandara: Proto-Chadic *b > *v. The fact that the Masa group and Biu-Mandara exhibit this sound change does not, however, indicate that the Masa group should be subclassified in Biu-Mandara. Such a proposal would attribute considerable importance to a single sound change which has occurred independently in other languages of the Chadic family. Moreover, there are three additional sound changes reconstructed for Proto-BM and Proto-BM-B which cannot be reconstructed for Proto-MG.

(18) Relative chronologies of the sound changes of Biu-Mandara and the Masa group

Proto-Chadic   Proto-Chadic

                          *b > *v   *b > *v
                          *S > * ɬ   *S > *s

Proto-BM

                          *r > *l
                          *d > *r / V_V   *d > *r / V_V

Proto-BM-B
                                         Proto-Masa group

                                                           * ɾ > *l

Kotoko   Musgu   South   North

5. Lexical Innovations

The presence of shared lexical innovations provides strong positive evidence for the subclassification of languages. In this section, I present five lexical innovations characteristic of the Biu-Mandara branch as a whole and one innovation characteristic of the Biu-Mandara-B subbranch. In each case, the languages of the Masa group do not exhibit these lexical innovations.

5.1. Biu-Mandara innovations. There are three words reconstructed for Proto-Chadic which are well attested in the West and East Chadic branches but absent in Biu-Mandara: Proto-Chadic *ba 'mouth', *ti 'to eat', and *baɗə 'five' [Newman 1977b]. The Biu-Mandara languages exhibit the innovations *ma 'mouth' and *zəmə 'to eat' [Newman 1977b]. As for Proto-Chadic *baɗə 'five', the Biu-Mandara languages exhibit reflexes of a form which I provisionally reconstruct as Proto-BM *ɓəm 'five'. In the case of each of these innovations, the Masa group exhibits a reflex of the Proto-Chadic form, not the Biu-Mandara innovation. The Proto-Chadic (PC) reconstructions and their reflexes in West and East Chadic and the Masa group as well as the Biu-Mandara innovations are illustrated in (19).

(19) Biu-Mandara lexical innovations

Proto-Chadic		BM	Masa	West	East
*ba	'mouth'	Mg *ma*	Z *vun*	Ha *baakii*	D *bii*
		G *ma*	Mu *vùn+nà*	Zr *vi*	So *bo*
		Db *ma*		Mi *vin*	
*ti	'to eat'	T *zəmə*	Z *ti*	Ha *ci*	D *tèè*
		Br *səm*	Ma *ti*	Ng *ta*	Bi *táyà*
		Bu *hum*		Kk *tu*	
*badə	'five'	Mg *ɬim*	Z *vàɬ*	Kk *baaɗu*	D *beeɗy*
		Mt *ʒam*	Ma *vàɬ*	Mi *vəɬ*	Ke *wiiɗiw*
		Gl *ʒəba*		Ng *vààɗ*	

In addition, there are two forms which are widely attested in the Biu-Mandara branch but which do not occur in East or West Chadic. I provisionally reconstruct these Biu-Mandara innovations as Proto-BM *kur- 'urine' and *tuw- 'to weep', following Jungraithmayr and Ibriszimow [1994]. These innovations do not appear in the Masa group. The Biu-Mandara reconstructions and their reflexes as well as the unrelated forms found in the Masa group are presented in (20). Note that the Masa [tii] 'to weep' is reconstructed for the northern subgroup as *tir. As seen in the reconstructions in Appendix B, word-final [r] has been lost in the northern subgroup with compensatory lengthening of the preceding vowel.

(20) Biu-Mandara lexical innovations

Proto-BM		BM-A	BM-B	Masa
*kur-	'urine'	Dg *kúrè*	Y *kóray*	Mu *súmúú+rā*
		Mt *kùrày*	G *kúnnɛ*	P *jə̀būr*
		Gs *kunnay*	Ko *ŋkúne*	
*tuw-	'to weep'	Gɗ *tūna*	Mg *twa*	Z *siʔi*
		Gs *tuway*	Ko *súwé*	Ma *tii*
		Dg *tàwá*		

Finally, the BM-B languages exhibit the irregular sound change *k > *f in Proto-Chadic *aku/akʷa 'fire'. In BM-A and the Masa group, though, the irregular *k > *f did not occur as seen in (21). The regular reflex of Proto-Chadic *k is Proto-MG *h, e.g., Proto-Chadic *kədəm 'crocodile' corresponds to Proto-MG *hurum. Thus, Proto-MG *ku 'fire' does not exhibit the expected reflex of Proto-Chadic *k. It remains to be determined why Proto-MG *ku did not undergo the sound change Proto-Chadic *k > Proto-MG *h.

(21) *k* > *f* in Proto-Chadic *aku/akʷa* 'fire'

Proto-Chadic	BM-B	BM-A	Masa
*aku/akʷa	Mg *afu*	Mt *akwa*	Ma *kū+nā*
	G *affa*	Gɗ *gwun*	Mb *akku+da*
	Lo *fu*	Hi *ɣwi*	P *kū*

As noted earlier, the presence of shared innovations provides positive evidence for subclassification. Six lexical innovations have been reconstructed for the Biu-Mandara languages. It is striking that the languages of the Masa group do not exhibit even one of the lexical innovations. The absence of these lexical innovations provides strong evidence against the subclassification of the Masa group in the Biu-Mandara branch of Chadic.

6. A Morphological Innovation

In this last section, I consider the innovation of the third person plural pronoun in Chadic. The three major branches of Chadic differ with respect to the shape of the third person plural pronoun. The West Chadic languages exhibit a reflex of the PC third person plural *sun [Kraft 1972, Newman 1980]. The northern subgroup of the Masa group exhibits the pronoun *-zi, a reflex of PC *sun. In the southern subgroup of Masa, though, the innovation *na occurs. In the East Chadic languages, the third person plural can be reconstructed as *k-ŋ, possibly originating from the PC plural determiner *k- and the *n plural [Schuh 1983a]. Finally, the Biu-Mandara languages exhibit the innovation *t-n [Kraft 1972]. These distinct pronouns are illustrated in (22).

(22) The third person plural pronoun in Chadic

Proto-Chadic	West	Masa	BM	East
*sun 'they'	Ha *suu*	Ma *nd+izi*	Ga *tənda*	Mk *+aŋ*
	Dw *suŋ*	Mu *azi*	Lo *+tən*	So *+giŋ*
	Gj *si*	P *ku+na*	Ba *tə̀*	Si *gə*
	Ge *sundi*	Z *ta+na*	M *dar*	

Note that the Biu-Mandara innovation *t-n cannot be reconstructed for the Masa group. The northern subgroup of the Masa group exhibits a reflex of PC *sun whereas the southern subgroup exhibits the innovation *na. The absence of this innovation provides further evidence against the classification of the Masa group in Biu-Mandara.

7. Conclusion

In summary, there is no conclusive evidence from shared innovations which supports the subclassification of the Masa group of languages in Biu-Mandara. The only shared phonological innovation which could indicate a close genetic relation between Biu-Mandara and the Masa group is the sound change Proto-Chadic *b >*v. However, this is a sound change which has occurred independently in other parts of the Chadic family. Moreover, there are three other phonological changes attested in Biu-Mandara which cannot be reconstructed for the Masa group. In addition, the Masa group does not exhibit the lexical and morphological innovations characteristic of Biu-Mandara and Biu-Mandara-B. Thus, I propose that the Masa group be classified as a separate, fourth branch of Chadic as first proposed by Newman [1977b].

Appendix A

Abbreviations

The following abbreviations are used in this paper. The classification of each language and sources for the data cited are also indicated. Newman [1977b] is abbreviated as 'N 1977', Jungraithmayr and Ibriszimow [1994]as 'J&I 1994.'

Ba	Bacama	BM, A, Bata group	Kraft 1972
Bi	Birgit	East, B, Dangla group	J&I 1994
Br	Bura	BM, A, Bura group	Kraft 1981
Bu	Buduma	BM, B, Kotoko group	Lukas 1939
D	Dangla	East, B, Dangla group	Fédry 1971, N 1977
Db	Daba	BM, A, Daba group	N 1977
Dg	Dghwede	BM, A, Mandara group	J&I 1994
Dw	Dwot	West, B, Saya group	Kraft 1972
G	Gidar	BM, B, Gidar group	Schuh n.d.
Ga	Gaɓin	BM, A, Tera group	Kraft 1972
Gɗ	Guɗe	BM, A, Bacama group	N 1977, J&I 1994
Ge	Geruma	West, A, Bole group	Schuh 1978
Gj	Geji	West, B, Saya	Kraft 1972
Gl	Glavda	BM, A, Matakam group	Rapp and Mühle 1969
Gs	Gisiga	BM, A, Matakam group	Lukas 1970, J&I 1994
H	Heɗe	Masa group	Noss 1990
Ha	Hausa	West, A, Hausa group	N 1977
Hi	Higi	BM, A, Higi group	N 1977, Kraft 1981
J	Jara	BM, A, Tera group	N 1977
Ke	Kera	East, A, Kera group	N 1977
Kk	Kanakuru	West, A, Bole group	N 1977
Ko	Kotoko	BM, B, Kotoko group	J&I 1994
Lng	Lamang	BM, A, Mandara group	Wolff 1983
Lo	Logone	BM, B, Kotoko group	Lukas 1936
M	Margi	BM, A, Bura group	N 1977
Ma	Masa	Masa group	Caïtucoli 1983
Mb	Marba	Masa group	Franco 1970, Price 1968
Mg	Musgu	BM, B, Kotoko group	Lukas 1941
Mi	Miya	West, A, Bole group	Schuh 1995
Mk	Mokilko	East, B, Mukulu group	Jungraithmayr 1990
Mn	Mandara	BM, A, Mandara group	N 1977
Mt	Matakam	BM, A, Matakam group	N 1977, Kraft 1981, J&I 1994
Mu	Musey	Masa group	Shryock 1995
N	Ngiɗe	Masa group	Noss 1990
Ng	Ngizim	West, B, Bade group	Schuh 1981a

P	Peve	Masa group	Cooper 1984, Hufnagel 1986
Pd	Paduko	BM, A, Mandara group	N 1977
Si	Sibine	East, A, Somrai group	Jungraithmayr 1978b
So	Somrai	East, A, Somrai group	N 1977
T	Tera	BM, A, Tera group	N 1977
Y	Yedin	BM, B, Kotoko group	J&I 1994
Z	Zime	Masa group	Hufnagel 1986, Kraft 1981
Zr	Zaar	West, B, Zaar group	N 1977

Appendix B

The Lexicon of Proto-Masa Group

This appendix contains a list of 204 words reconstructed for Proto-Masa group with the data supporting these reconstructions. The data cited below is taken from the sources noted in Appendix A for the respective languages. In the case of Peve, 'P' designates data from Cooper [1984], and 'P2' data from Hufnagel [1986]. Likewise, 'Z' designates Hufnagel [1986], and 'Z2' Kraft [1981].

The consonantal inventory outlined in (1) is reconstructed for Proto-Masa group. In addition, five vowels are reconstructed: *i, *e, *a, *o, *u. Tone has not been reconstructed. The tone patterns of verbs are not indicated because tone has a grammatical function in these languages, indicating the aspect of the verb (cf. [Jungraithmayr 1978a, Caïtucoli 1983]). For the nouns, however, tone is lexical; consequently, the tone of the nouns has been indicated if transcribed in the original source. Finally, in Masa, Musey, and Marba, the grammatical gender of nouns is explicitly marked by an enclitic: /na/ for masculine nouns, /da/ for feminine nouns.

(1) Consonantal inventory of Proto-MG

p		*t*		*c*		*k*		
b		*d*		*j*		*g*		
ɓ		*ɗ*						
mb		*nd*		*nj*		*ŋg*		
f	*s*	*ł*						*ħ*
v	*z*	*ɮ*						*ɦ*
m		*n*				*ŋ*		
		l						
w		*r* *ɾ*		*y*				

1.   to accompany: *tin
       Ms tin, Mb tin, P cin, H tin
2.   antelope: *zar
       Ms zàà+nà, Mb azar+a, P zār, H zar
3.   ashes: *but
       Ms bùt+nà, Mb but+na, P būt, H butu, N pùtù, Z buɗ
4.   to ask: *j-p
       Ma jop, Ms jop, Mb jop, P2 caɓ la, H cap
5.   arm, hand: *ɓa
       Ma ɓám+nā, Mb abo+na, P ɓā, H ɓa, N ɓá, Z ɓa
6.   to awake: *ʐ-
       Ma ʐii, Ms ʐit, Mb ʐi, H ʐaʔ
7.   bark, peal: *b-l-k
       Ma ɓūlōk+ŋā, Ms ɓōlók+ŋā, Mb bloh+a, P bēlē?, H bəle?
8.   bat: *babay
       Ma bàybày+nà, Ms bàbày+nà, Mb abibey+na, P bēbāy, H bəbay
9.   bean: *ɾit
       Ms līt+nà, Mb alit+na, P réɗ, H reɗe
10.   bee, honey: *y-m
       Ma yúm+nā, Ms yūm+má, Mb ayum+a, P īm, H yem, yam, Z yem
11.   beer: *sum
       Ms sūm+mà, Mb sum+a, P sūm, H sum
12.   to belch: *giɫ
       Ma giɫ, Ms giɫ, Mb giɫ, P2 gil, H giɫiʔ, Z giɫi
13.   to bite: *et
       Ms et, Mb et, P2 et, H et, N ete, Z eɗe
14.   black: *wura
       Ma wūrā, Ms wár, Mb ura+da, P2 uraʔ, H uraʔ, Z2 wura
15.   blacksmith, hammer: *caf
       Ma cāf+nā, Ms cāf+fā, H caf
16.   blow: *fo
       Ma fo, Ms fo, Mb fo, P foʔ, H foʔ, Z foʔo
17.   blood: *vuzur
       Ma bùzùù+nà, Ms bùzùù+nà, Mb buzu+na, P vūsū, H vursu, Z vursu
18.   body: *tu
       Ma tūù+nà, Ms tá+rā, Mb ta+da, P tū, H tu, Z tu
19.   to boil: *zaɾ
       Ma zal, Ms zal, Mb zal, P2 sar, H sar, Z2 ʒar

20. bone: *sok
    Ma zŏk+ŋā, Ms sōk+ŋà, Mb assoh+a, P ùsō, H uso, Z iseu
21. brain: *toʔon
    Ma tōɗōn+nā, Ms tōtōʔōn+nā, Mb tohon+da, P tūʔóm wā, H teʔem wa, Z2 toʔom
22. to break: *k-s
    Ma kus, Ms kus, Mb kus, P kəy, H kas, Z kas
23. breast: *po
    Ma pō+nà, Ms pō+nà, Mb appo+na, P pāʔ, H paʔ, Z pa
24. to breathe: *m-s-k
    Ms mūzūk, Mb muzuk, P2 mai, H mas
25. broom: *samat
    Ms sámát+nā, Mb assumat+na, P sāmɗà
26. to carve: *cet
    Ma ceɗ, Ms cet, Mb cet, P ceɗ, H ceɗ, N ceɗe, Z ceɗ
27. charcoal: *v-n
    Ma vèŋ+ŋà, P vōn, L ʔə́vàn
28. chin: *d-m
    Ma dŭm+nā, Ms dŭm+mā, Mb dudum+a, P jīm, H dim, Z2 dum
29. co-wife: *h-n
    Ms hēnē+rà, H hin
30. cold: *hep
    Ms hēp, Mb ahep, P heɓ, H heɓ
31. to come: *mb-
    Ma mba, Ms mba, Mb mba, P mbu, H mbu, Z mba
32. to cough: *oɫ
    Ma oɫ, Ms oɫ, Mb hoɫ, P oɫ, H uɫoʔ, Z oɫ
33. crocodile: *hurum
    Ma hūrūm+nā, Ms hūrùm+mà, Mb hurum+a, P hūrūm, H hurum, N hūrūm, Z hurum
34. to cultivate: *zum
    Ma zum, Ms zum, Mb zum, H zum
35. to dance: *ndur
    Ma nuɫ, H nduru
36. darkness: *nduvun
    Ma jùfūn+nā, Ms ndùvún+dā, Mb nduvun+da, H ndufun, Z2 ndufun
37. death, funeral: *mat
    Ma mĭt+nà, Ms māt+nà, Mb mat+na, P māt, H mata

38. dew: *mb-ɗ-
    Ma māɗíí+nā, Ms mbàɗàgí+nā, Mb mbadi+da, P mbə̀ɗà, H mbəɗa,
    Z2 miɗa

39. to die: *m-t
    Ma mit, Ms mit, Mb mit, P mat, H mat, Z mat

40. to displace: *j-k
    Ma jok, Ms jok 'move', Mb jok, H jik

41. to do: *ɾi See 'time', 'place'
    Ma li, Ms li, Mb le, P ri, H re

42. dog: *d-
    Ma dīī+nā, Ms dī+nā, Mb adi+da, P dā, H əda, N āīdāʔ, Z aida

43. to drink: *ci
    Ma ci, Ms ci, Mb ce, P2 ce, H ce, Z ce

44. ear: *hum
    Ma hùm+nà, Ms hūm+bà, Mb hum+ba, P hūm, H hum, N húm, Z hum

45. to eat: *ti
    Ma ti, Ms ti, Mb te, P ti, H ti, N ti, Z ti

46. to eat meat: *k-m
    Ms kom, P kam, H kam

47. egg: *se
    Ma zè+nà, Ms sē+nà, Mb asse+na, P ʃēʔ, H seʔ, N ʃeʔ, Z seʔe

48. to enter: *kal
    Ma kal, Ms kal, Mb kal, P2 kal, H kal

49. excrement: *sot
    Ma sūɗáy+nā, Ms sōt+nà, P sóɗ, H soɗ, Z soɗo

50. to extract: *pat
    Ma pat, Ms pat, Mb pat, P pat, H pat

51. eye: *ir
    Ma ĩ̀ì+rà, Ms íí+rà, Mb ir+a, P ī, H ir, N ér, Z ir

52. to fall: *nd-
    Ms ndi, Mb nde, P ndie, H nde, Z2 nde

53. father: *b-
    Ma bùm+nā, Ms bú+nā, Mb abu+na, P bà, H əba, ba, Z2 buba

54. feather: *ɮ-m
    Ma ɮìmìt, Ms ɮīmīt+tā, Mb łimit+a, P lām, P2 łam, H lam

55. field: *sine
    Ma sīnè+nà, Ms sēnè+nà, Mb assine+na, P2 ʃine, H sine, Z sine

56. field rat: *njuk
    Ms njùk+ŋà, Mb anjuh+a, P2 njuk, H njuk, Z njuku

57. fig tree: *turum
    Ms tùlúm+nā, Mb tulum+a, P tūrúm
58. fire: *ku
    Ma kū+nā, Ms kū+rà, Mb akku+da, P kū, H ku, Z ku
59. fish: *k-ɾf-
    Ma kūlùf+nà, Ms kūlùf+fà, Mb kluf+a, P kīēfè, H kerfe, N kérfé, Z kifeʔe
60. five: *vaɫ
    Ma vàɫ, Ms vàɫ, Mb vaɫ, P vāɫ, H vaɫ, N vàɫ, Z vaɫ
61. flour: *fut
    Ms fūt+tà, Mb affut+a, P fūt, P2 fur, H fut, Z2 fut
62. flute: *d-f
    Ma díf+nā, Ms díf+fā, Mb adif+a, P dūp, H duf
63. fly: *raw
    Ma rāw+nā, Mb aro+na, P rīrēw, H rirew, Z larau
64. foot, leg: *sem
    Ma sēm, Ms sēm+má, Mb assem+a, P ʃēm, H sam, L sém, N sám, Z sem
65. to forge: *ɠi
    Ma ɠi, Ms ɠi, Mb ɠe, P ɠam, H ɬe
66. fork, forked stick: *garak
    Ms gàràk+ŋà, Mb grak+a, L garak
67. four: *fiɗi
    Ma fīɗì, Ms fíɗì, Mb fidi, P fə́ɗīʔ, H fiɗiʔ, N fə́ɗì, Z fiɗi
68. front: *v-k
    Ma vòk+ŋà, Ms vòk+ŋà, Mb voh+a, P vūk, H vuk
69. to fry: *haw
    Ma haw, Ms haw, Mb haw, P haw, H haw, Z hau
70. girl: *way
    Ms wáy+rā, P wāy, H wai
71. to give birth: *vut
    Ma vuɗ, Ms vut, Mb vut, P fə̀ràʔ, H və́ráʔ, Z vraʔa
72. to go: *t-
    Ma tuɗ, Ms tut, P ta, H ta, Z ta
73. goat: *hu
    Ma ɦù+nà, Ms ɦù+nà, Mb ahu+na, P hū, H uhu, Z afu
74. granary: *z-ŋ
    Ms zàŋ+ŋà 'shelter', Mb azāŋ+a 'shelter', P2 zəna, H sə̀na, Z ziŋa
75. grass: *-s-
    Ma wūs+nā, Ms úùzú+nā, Mb assu+na, P2 za, H əsa

76. grave: *us
    Ma wūs+nā, Ms ūs+sà, Mb assu+da, H wa us
77. to grill: *war
    Ms war, P wor, H war
78. hair: *ŋgusa
    Ms ŋgús+sā̄, P sā́ wā, H ŋgisā wa, Z ŋgisa wa
79. hare: *v-t
    Ma vèt+nā, Ms vèt+tà, Mb avvivet+a, P fə́dī̄ʔ, H fiti, Z viti
80. harmattan: *kut
    Ms kūt+nā, Mb akkukut+na, P kūt, H kut
81. to hatch: *eł
    Ma eł, Ms eł, P ieł, H eł
82. to hear, understand: *hum
    Ma hum, Ms hum, Mb hum, P hum, H hum, N hum, Z2 hum
83. heart: *g-l-s
    Ma glès+nā, Ms gílís 'kidney', P gəla vəsə
84. hedgehog: *cem
    Ma cȅmcȅm+nà, Ms cêmcém+mā, Mb cicem+a, P cēcīmè, H caŋcime
85. to help: *njin
    Ms njun, Mb njun, P jin, H jin
86. to hit: *p-m
    Ms poŋ, P pum, H pum
87. to hit, kill: *ci
    Ma ci, Ms ci, Mb ci, P ci, H ci, N ci, Z ci
88. hole: *z-ɾ
    Ma zùl+lā, Ms zùl+là, Mb zul+a, P zə̄rā, H zəra, Z zra
89. horn: *mek
    Ma mīyōk+ŋā, Ms mēk+kā, P mīēk, L méké, Z mek
90. hunger: *me
    Ma máy+nā, Ms māy+rá, Mb mey+da, P mīē̄ʔ, H meʔe, Z2 me
91. hunt: *ram
    Ms lām+bà, Mb alam+ba, P rāŋ, H raŋ
92. hut, compound: *z-
    Ma zìì+nà, Ms zì+nà, Mb azi+da, P só, P2 zəba, H za, Z za
93. intestines: *r-w-t
    Ma rwāt+nā, Mb arruwat+na, P rāwⱱi, H raw
94. knee: *gif
    Ms gìf+fà, Mb gigif+a, H cin gif, Z vun gif

95. to know, see: *wi
   Ma wi, Ms wi, Mb we, P waʔ, H ye, Z we
96. land, uninhabited and uncultivated: *fur
   Ms fūl+là, H fur
97. larynx, voice: *hor
   Ms hòó+nā, Mb hor+ã, P hòr, H hor
98. leaf, foliage: *ɬab
   Ms ɬáp+mà, Mb aɬap+ma 'shrub, bush', P ɬāp, H ɬapa, Z ɬaɓ
99. to leave, forbid: *hin
   Ma hin, Ms hin, Mb hin, P hin
100. left: *guɾ
   Ms gùl, P2 gur, H2 gura, Z gur
101. to lift: *ɬi
   Ma ɬi, Ms ɬi, Mb ɬe, P ɬie
102. liver: *duk
   Ma dúk+ŋā, Ms dúdúk+kā, Mb aduduk+a, P2 duk, H tuk, L dùk, Z2 aduk
103. to lose, disappear: *viɗ
   Ms vit, Mb vit, P fiɗ, H viɗ
104. mahogany (Khaya senegalensis): *g-m
   Ma gám+nā, Ms gám+mā, L guma, Z2 guma
105. man, husband: *nj-f
   Ma jŭf+nā, Ms njŭf+fã̄, Mb njuf+a, P njī, H nji, N njìf, Z nji
106. mat: *ɟat
   Ma ɟa͂t+nā, Ms ɟăt+nā, Mb ɟat+na, P lāʔ, H laʔa
107. to mature: *ceŋ
   Ms jeŋ, P ceŋ
108. meat, flesh: *ɬiw
   Ma ɬīw+nā, Ms ɬīw+nā, Mb ɬiu+na, P ɬíéw, H ɬew, Z ɬeu
109. melon: *b-
   Ma búū+nā, Ms bú+nā, Mb bubu+da, P2 boʔ, H poʔ, Z2 boʔo
110. milk: *mbir
   Ma mbíī+rā, Ms mbìì+rà, Mb ambi+ra, P mbīr, H mbir, Z2 mbir
111. to mix: *ɬum
   Ms ɬum, P ɬum, H ɬum
112. monkey: *vir
   Ma vìì+rà, Ms vìì+rà, Mb vi+ra, P vīr, H vir, Z vir
113. moon: *tiɾ
   Ma tīl+tā, Ms tīlã̄, Mb til+a, P cēr, H tér, Z ter

114. mortar: *zu
     Ma zùù+nà, Ms zùzú+nā, Mb zuzo+da, P2 zuʔ, H zuʔu

115. mouth: *vun
     Ma vùn+nà, Ms vùn+nà, Mb vun+a, P vūn, H vùn, Z vin

116. mud, clay: *rubu
     Ms lūɓú+nā, Mb lubu+na, P rəɓà, P2 ruɓ, H rúɓú, Z luɓu

117. mud: *dorɓo
     Ms dòròɓóp+mā, Mb dorbop+ma, H dōrɓō, Z2 dorɓo

118. mushroom: *bik
     Ms bík+kā, Mb abigi+da, P bīk, H bik

119. name: *sem
     Ma sēm+nā, Ms sēm+má, Mb simi+na, P ʃēm, H sam, N sə́m, Z sem

120. navel: *fuk
     Ms fūk+kā, Mb uf+a, P fú, H úfú, Z2 afuk

121. nose: ˉ*cin
     Ma cin+nà, Ms cīn+nà, Mb acin+a, P cīn, H cín, Z cin

122. to obtain: *fi
     Ma fi trouver, Ms fi, Mb fe, P fie, H fe, Z fe

123. to offer a sacrifice: *ɓi vun
     Ms ɓi vùn, P ɓie vūn, H ɓe vun

124. oil, grease, fat: *mbur
     Ma mūl+lā, Ms mbùl+lā, Mb mbul+a, P mbúr, H mbur, N mbúr, Z mbur

125. okra: *ʐor-
     Ms ʐòònò+rà, Mb zulo+da, P ʐōr, H ʐor, Z ʐor

126. penis: *ɗiw
     Ms ɗīw+rā, Mb diw+da, P2 ɗiu, H ɗiw

127. people: *su
     Ms sūū, Mb suma+na, H suno, L sundo

128. person: *s-
     Ma sā+nà, Ms sā+nà, Mb sa+na, P sù, H su, N sū, Z su

129. place: *ri
     Ma līí+nā, Ms l̄i+nā, P rī, H ri, Z li

130. placenta: *tuʔom
     Ms tōʔòm+mà, Mb atohom+a, P tūʔóm, L tuʔom

131. to play: *riu
     Ma liu, Ms luu, Mb lu, P2 ru, H riu, N riu 'to dance', Z liu

132. pus: *r--
     Ms lōō+rā, P rīw, H rirew

133. to put: *tin
    Ma tun, Ms tin, tun, Mb tin, P cin, H tiŋ, Z tiŋ
134. to rain: *si
    Ma si, Ms si, Mb se, P ʃe, L sé
135. rainy seaon: *ndoɾ
    Ms ndòl+là, Mb andol+a, P ndór, H ndor, Z2 ndor
136. to recieve: *fi
    Ma vi, Ms vi, Mb ve, P vie, H fe
137. to recline: *b-r
    Ma bur, Ms bur, Mb bur, P par, H bar, Z bar
138. red: *ɬew
    Ma ɬāw, Ms ɬāw, Mb ɬew, P ɬíéw, H ʒeo, Z2 ɬeo
139. to return: *hom
    Ms hoŋ, Mb huloŋ, H hom, Z hom
140. rhinoceros: *gay
    Ma gáy+nā, Ms gày+rà, P gāīʔ, H gay, L gəʔì
141. to ripen: *ne
    Ms ne, Mb ne, P nie, H ne, Z neʔe
142. road, path: *vot
    Ms vót+tā, Mb lovot+a, P vārì, H vārī, N fààrì, Z2 vari
143. to roast: *cuf
    Ma cuf, Ms cuf, Mb cuf, P cu, H cuʔu, Z cu
144. rooster: *golok
    Ms gògòlók+ŋā, P gùlòk, H gùlòk
145. root: *s-r
    Ma súdāy+nā, Ms sárí+nā, Mb sidey+na, L sér, Z seɗ
146. rope: *zew
    Ms zĕw+nā, Mb zyeu+na, P ʃèw, H zèu, Z zeu
147. roselle (hibiscus Sabdarifla): *ʒembe
    Ma ʒém+nā, Ms ʒém+mā, Mb aʒem+a, P ʒèɓ, H ɬeɓe, Z leɓe
148. saliva: *ne
    Ma nēēnē+nā, L neʔe
149. salt: *vu
    Ms vùvú+nā, P vū, H úvù, Z2 avu
150. sand: *ŋeɬ
    Ma ŋĕɬ+nā, Ms ŋgĕɬ+ɬā̃, Mb yeɬ+a, P nyēɬ, H ŋéɬē, Z ŋgeɬ
151. sauce: *mbaɾ
    Ms mbàlá+rā, Mb ambla+da, P mbár, H mbár, Z mbar

152. to scratch: *hurok
     Ms horok 'to plow, farm', P hurok, H hurok
153. seed: *ir
     Ms íi+rà, P ī
154. to send: *s-n
     Ma sun, Ms sun, Mb sun, P ʃin, H sin, N sin, Z sin
155. seven: *siɗa
     Ma sīdíyā, Ms kīɗīsíyā, Mb kidisya, P ʃéɗāʔ, H séɗá, N seɗaʔ, Z2 seda
156. to shake: *gasak
     Ma gas, Mb gas, P2 gəzak, L gəsàk
157. sheep: *time
     Ms tímí+rā, Mb timi+da, P cīmé, H tīmé, Z time
158. to shine, flash: *wile
     Ms welet, Mb wile+da, P wuɗi, H wuli, L wileʔe
159. shoulder, upper arm: *bike
     Ms bìk+ŋà, Mb bik+a, P bìkè ɓā, Z2 wa bike ba
160. side, rib: *hay
     Ma hây+nà, Ms hāy+rà 'stomach', Mb hay+da 'stomach', P hāiʔ 'beside',
     H hai
161. six: *kargi
     Ma kārgī yā, Ms kārgī yá, Mb karagaya, P kánkīʔ, H kángī, H kángì,
     Z2 kandi
162. sleep: *sen
     Ma sēn+nā, Ms sēn+nā, Mb sey+na, P ʃēn, H sen, N sên, Z sen
163. small: *g-
     Ma gòr, Ms gòr, Mb gugor, H gaʔ, Z2 gaʔa
164. spear: *sap
     Ms sāp+pā, Mb assap+a, P sāɓ, H sāɓā, Z asaɓa
165. spirit: *ful
     Ma fúl+lā, Ms fūl+lã̄, P ífràyā , H, Z2 afi 'sky'
166. spirit, shadow: *ŋg-s
     Ma ŋùs+nā, Ms ŋgūs+sã́, Mb aŋus+a, P nyís, H ŋgìsí
167. to squeeze: *em
     Ms em, Mb em, P iem, H em
168. to stand up: *cor
     Ma col, Ms col, Mb col, P car, H car, Z car
169. star: *ciw
     Ms cîwcíw+rā, Mb ciciw+da, P cì cīw, H ìcīu, Z2 ciciu

170. to steal: *kuɾ
     Ma kul, Ms kul, Mb kul, P kəy, H kir, Z kir
171. stone: *goy
     Ms gòy+rà, P2 goiʔ, H gwoiʔi, N kwòi, Z2 goy
172. story: *nd-n
     Ms njùnjùn+dà, Mb jujun+da, P njìˋn, H ndin, Z ndindiŋ
173. to strike: *p-m
     Ms poŋ, P pum, H pum
174. to suck: *sop
     Ms sop, Mb sop, P soɓ, H soɓo, Z soɓ
175. sun: *fat
     Ma fâat+nà, Ms fāat+tà, Mb affat+a, P vɘ̀tà, H fútá, Z faɗa
176. sweat: *z-mb-ɾ
     Ms zàmál+lɑ̃̀, Mb zumal+a, P sùmbùr, L sùmbùr
177. to swim: *lus
     Ms lus, P lus, H lus
178. tail: *c--
     Ma cáw+nā, Ms njáw+rā, Mb anjaw+da, P cēw, H cēu, Z ceu
179. to take out: *pat
     Ma pat, Ms pat, Mb pat, P pat, H pata
180. tamarind: *cin
     Ma cīn+nā, Ms cīn+dà, Mb acin+da, P mɘ̀cīn, H mīīsīn, L maicín, Z
     minjin
181. ten: *gup
     P gūɓ, H guɓ, N gwuɓ, Z guɓ
182. three: *hindi
     Ma fììɗì, Ms hīīndì, Mb hindi, P hínjì, H hínɗì, N híndìʔ, Z hindi
183. throat, voice: *deɾ
     Ma dèl+là, Ms dèl+là, Mb del+a, H ɗìràì, Z der
184. to throw: *g-
     Ma gi, Ms gi, Mb ge, P gie, H ge, Z2 ge
185. throwing knife: *b-ɾ
     Ma bìˆl+lɑ̃̀, Ms bíl+nā, Mb abìˆl+a, P pɘ̀rà, H brà
186. time: *ɾi
     Ms līˋ+nà, P rī, H ri
187. tongue: *si
     Ma sīn+nā, Ms sīn+dá, Mb sin+a, P ʃīɗìˋ, H sílé, N sīlī, Z cil
188. tooth: *s-
     Ma sìˆì+nà, Ms sīīˋ+nà, Mb si+na, P ʃēʔ, H seʔ, N séʔé, Z seɗ

189. tree, wood: *gu
    Ma gú+nā, Ms gú+nā, Mb aggu+na, P gū, H úgù, N ūkū, Z ago

190. urine: *jumbur
    Ma zùmūū+rā, Ms súmúú+rā, Mb sumu+ra, P jə̀būr, L jubur

191. to vomit: *vin
    Ma vin, Ms vin, Mb vin, L vìnè?è

192. vulture: *bak
    Ma bàk+ŋā, Ms bàk+ŋà, Mb abah+a, P2 bwok, L bok

193. warthog: *z-ŋ
    Ma zéŋ+ŋā, Ms zéŋ+nā, Mb azeŋ+a, P ʒīŋ, H ziŋ, Z ziŋ

194. to wash: *mbus
    Ma mus, Ms mbus, Mb mbus, P mbi, H mbis, L mbus, Z mbus

195. to wash grain: *sal
    Ms sal, P sal, H sal

196. wasp: *viŋ
    Ms vì ŋvīŋ+ŋā, Mb viviŋ+a, H vì vì

197. to watch: *gol
    Ms gol, Mb gol, H gól

198. water: *mb-
    Ms mbòó+nā, Mb mbyo+na, P mbi, H mbi, Z mbi

199. what: *mi
    Ma mì gé, Ms mī, Mb me, P mə̄ , P2 mi su, L mi

200. to whistle: *f-t
    Ms fet, Mb ge fet, P fədiw, H fidiu

201. wind: *simbet
    Ma símēd+nā, Ms sémét+nā, Mb simet+na, P2 simbed, H símbē?, Z2 simed

202. wound, sore: *mbir
    Ma mīl+lā, Ms mbìl+là, Mb mbīl+a, P mbīr, H mbìr

203. year: *kim
    Ms kīm+bá, P kīm, H kīm, Z2 kim

204. yesterday: *k-mb-
    Ma kāmā+tā, Mb kama, P kúm, L kúmbu, kəmbat

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AGAINST VOWEL LENGTH IN TIGRINYA*

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The premise of this paper is that vowel length plays no role in the synchronic phonology of Tigrinya: processes affecting vowels should be treated in qualitative terms only. The evidence in favor of synchronic vowel length is weak, and stronger evidence favors an analysis in which vowel length is phonologically irrelevant. While some researchers have made use of contrastive vowel length in the modern language to account for ostensible closed-syllable shortening, the analysis presented here shows that the relevant alternations are very limited in scope and represent at best the residue of historical vowel length. The evidence presented includes word minimality, vowel coalescence, word-final fronting, guttural lowering, and low dissimilation, with analyses of these phenomena in purely featural terms.

0. Introduction

The analysis of the Tigrinya vowel system raises basic questions of abstractness and productivity. While the inventory, on the surface, consists of seven vowels well distinguished by quality, this system developed from an earlier one based partly on length. The issue that I address in this paper is whether the residue of alternations which date from the time of contrastive vowel length requires a synchronic analysis which continues to make reference to length. Most traditional accounts of Tigrinya [Leslau 1941, Ullendorff 1955] consider length non-contras-

tive, i.e., a secondary phonetic fact about the various vowels. In generative work, however, the opposite assumption is common. In particular, the first generative analysis of Tigrinya [Pam 1973] and a number of more recent works in the Charm and Government framework [Angoujard and Denais 1989, Denais 1990, Berhane 1991, Lowenstamm 1991] posit vowel length in the phonology. The main role for the length contrast is the analysis of apparent closed-syllable shortening in word pairs such as f.sg. *ħaddas* and pl. *ħaddʌs-ti* 'new'. I contend, to the contrary, that the traditional view is correct, and vowel length has no phonological role in the modern language. The evidence is twofold. First, alternations such as *a~ʌ* are found only in quite limited morphological contexts. Second, an assumption of contrastive length makes false predictions about syllable structure, word size, and featural alternations.

I begin in §1 by describing the historical development of the vowels and by summarizing previous approaches to vowel length in Tigrinya. In §2, I outline the syllable structure of the language and show how a moraic analysis easily explains the nature of minimal word size. In §3, I consider the evidence that has been presented in favor of synchronic closed-syllable shortening, showing that the process is limited to a small set of morphological contexts, and amply contradicted elsewhere. I give an alternative analysis of the alternations as templatic vocalisms. In §4, I present evidence that synchronic vowel coalescence—though it is historically responsible for the creation of two of the supposed long vowels— makes no reference to vowel length, and submits to a simpler analysis if no length is present. In §5, I turn to three other purely featural processes which either contradict predictions of a length-based analysis, or which are more simply analyzable without length: these are fronting in word-final position, lowering next to a guttural consonant, and dissimilation of low vowels. A conclusion is given in §6.

1. The question of vowel length

1.1. Historical development. As do most Ethiopic Semitic languages [Leslau 1966: 595], Tigrinya has a symmetrical seven-vowel inventory (1).[1] In the indigenous terminology for the Ethiopic syllabary, each vowel constitutes an 'order', numbered in the following fashion: first order /ʌ/, second order /u/, third /i/, fourth /a/, fifth /e/, sixth /i/, and seventh /o/. These terms are used in a few quotations cited below.

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[1] The vowel [ʌ] is traditionally transcribed <ä>; while it often has a fronted quality, it patterns phonologically as a mid central vowel (see below and Buckley [1994]; for phonetic discussion of the corresponding Amharic vowel, see Devens [1983]). Similarly, [i] is often transcribed <ə> but is a high vowel. In this paper, <c> represents [tʃ], and <j> is [dʒ]. I omit indication of the fact that after a vowel, nongeminate /k, k̓/ surface as [x, x̓] due to a well-studied rule of spirantization [Leslau 1941: 5, Schein 1981, Kenstowicz 1982].

(1) *The Tigrinya vowel system*

    i   ɨ   u

  e   ʌ   o

     a

Historically, the system in (1) developed from the Proto-Semitic system (2) of three short and three long vowels, which survives in Classical Arabic [Bergsträsser 1983: 5]. The three modern Tigrinya peripheral vowels /i, a, u/ correspond to the proto long vowels (3a); the mid vowels /e, o/ are derived from the diphthongs **ai, *au* by coalescence (3b); and while mid central /ʌ/ derives uniquely from short **a*, high central /ɨ/ represents a merger of the vowels **i* and **u* (3c).

(2) *The Proto-Semitic vowel system*

    i i: u u:

      a a:

(3) *Historical changes in the vowels*

    a. *Long vowels*   **i:*   **u:* > i u

                           *a: a

    b. *Diphthongs*   **ai *au* > e o

    c. *Short vowels* **i*   **u* >   ɨ

                          *a   ʌ

These changes are well accepted (see Ullendorff 1955: 161, Voigt 1983: 356, and Denais 1990: 60). The question of whether vowel length is phonemic in modern Tigrinya is essentially a question of whether these are still productive rules in the language. I maintain that rules (3a, c) are no longer a part of the language because contrastive length has been lost from the phonology (§3). While diphthongs do become mid vowels in the synchronic grammar (3b), this is purely a matter of the coalescence of features and has no relation to length (§4).

1.2. Traditional views. The major references in the pre-generative tradition of Tigrinya grammatical analysis generally assume that vowel length is historical only, i.e., that the distinctions in the seven-vowel system of (1) are based on quality rather than quantity. Leslau [1941: 8f] does refer to length in his characterizations of Tigrinya vowels, saying that except for the "short" vowels /ɨ, ʌ/, all the vowels "can be long or short".[2] More specifically, he describes /ʌ/ as having "une quantité

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2 "Toutes les voyelles sauf les brèves *ä* (*ǎ*) et *ə* (*ŭ*) peuvent être longues ou brèves; *a* est le plus souvent long."

moyenne", while /a/ is "le plus souvent long"; /i/ is "une voyelle brève", while /i/ "peut être long ou bref"; /e/ is "quelquefois long". These descriptions are, however, impressionistic in nature and identify phonetic tendencies; crucially, he does not, for example, treat /ʌ/ as a short version of /a/, though this is the historical origin of the contrast.

Confirmation of this interpretation comes from a later source. Leslau [1966: 595], in discussing general properties of Ethiopic Semitic languages, states that "There is no quantitative distinction except in some vowels of Harari, Tigre, Ennemor, and Zway; Ge'ez, too, probably had a quantitative distinction." Tigrinya is conspicuously absent from the list. Ullendorff [1955: 159f] is quite emphatic on this point: "The seven Ethiopic vowel-orders all express qualitative distinctions; quantity has no place in this scheme at all." He echoes Leslau's statements when he says that "Each of the seven vowels can be long or short, although some are more frequently long and others more generally short." He continues that "the non-phonemic character of vowel quantity in Ethiopic is, in my view, certainly applicable to Gǝ'ǝz, Tigrinya, Tigre, and Amharic." Ullendorff singles out "the erroneous assumption that the 1st and 4th orders, on one hand, and the 6th and 5th orders, on the other, stand to each other as the equivalent short and long vowels." The pairs he refers to are /ʌ, a/ and /i, e/. I have encountered no modern work in which /i, e/ are distinguished only by length; Ullendorff may be thinking of orthographies such as Conti Rossini's [1940] use of <ĕ> for /i/. However, as seen below, the pair /ʌ, a/ figures prominently in arguments regarding synchronic vowel length.

Thus, while Leslau and Ullendorff disagree regarding Ge'ez and Tigre, both agree that vowel length is non-distinctive in Tigrinya. Similarly, Tubiana [1956: 82] claims that the Tigrinya vowel system has replaced length with qualitative distinctions. This assumption is found also in the generative approach of Kenstowicz [1982: 107f], who links all vowels to a single V-slot: in this approach the only way to mark a vowel as long is by linking it to two V-slots, and the fact that Kenstowicz does not do this for vowels such as /a/ and /e/ shows that he considers them to be short. The same is true for Schein [1981: 37]. Schein and Steriade [1986: 709] explicitly state that "Tigrinya does not allow doubly linked [+syllabic] segments (that is, long vowels)." For all these researchers, the distinction among Tigrinya vowels is purely qualitative (or "featural" in modern usage). Though there are of course secondary differences in phonetic duration, this quantitative property plays no role in the phonology.[3]

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[3] The only phonetic data regarding Tigrinya vowel length that I have found in the literature are in Sumner [1957: 44], who reports the following mean vowel durations (in milliseconds) in Amharic words, but as pronounced by a native speaker of Tigrinya: [i]=60; [u]=70; [ʌ]=75; [i]=80; [a]=100; [e]=120; [o]=125. Both languages have the same vowel inventory; and Denais [1990: 61] notes that the speaker's articulation of [ʌ] conforms to the more anterior pronunciation of Tigrinya rather than Amharic, suggesting that he used his native vowels. Note in

1.3. Contrastive vowel length? Contrary to the traditional view that vowel length is not contrastive in Tigrinya, we can identify two basic generative approaches which grant a role to vowel length in the synchronic phonology. One is represented by the first generative analysis of Tigrinya phonology, Pam [1973], who claims that underlying distinctions involve quantity as well as quality.[4] Pam [p. 51] gives the following five underlying vowels.

(4) *The vowel system of Pam* [1973]

  i: i: u:
   a, a:

This system is identical to the Proto-Semitic system given in (2) above with one exception: the two short high vowels *i, *u have been collapsed as /i/. For Pam, however, the rule merging these two vowels is still active in the language: when /i:/ and /u:/ are shortened (as before a consonant cluster: §3), they become [i]. In this system, surface tokens of [e:, o:] result from coalescence of /ay, aw/. Similarly, [ʌ] is derived from /a/, which in turn is distinguished from /a:/ only by quantity. Since many of Pam's theoretical assumptions have been abandoned in current work, I will not dwell on the details of his quite abstract analysis.

A number of more recent analysts working in the Charm and Government approach [Kaye et al. 1985] accept the seven-vowel inventory in modern Tigrinya and its fundamentally qualitative distinctions, but also assume redundant length differences [Angoujard and Denais 1989: 104, Denais 1990: 29, 54, Berhane 1991: 14, Lowenstamm 1991: 962]. That is, the historically long vowels are synchronically long as well, yielding the following inventory.[5]

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particular that the 'long' vowel [u] is shorter than [ʌ]. While these durations are not incon-sistent with a phonological length distinction (assuming appropriate phonetic implementation rules), they do not obviously point to one. For example, Peterson and Lehiste [1960] report that in English the vowel [æ] (=330 ms) is longer than [ɛ] (=200), which in turn is longer than [ɪ] (=180); but all are phonologically short. This reflects the generalization that low vowels are typically longer than high vowels. Further, House [1961: 1177] suggests that the "diminution of duration associated with lax vowels ... might be attributed to a reduction in the vocal effort expended in producing the vowels." Since the 'short' vowels /i, ʌ/ are closest to a neutral tongue position, they should be expected to require less time to articulate. At any rate, the phonological representation of vowels must be based on phonological evidence, and that is the subject of this paper.

[4] Pam [1973: 43] accepts short [i, u] only as allophones of /i/ adjacent to a palatal or labial consonant. It can also be noted here that in his brief discussion of the location of Tigrinya epenthesis, Noske [1988: 56ff, 1993: 114ff] adopts Pam's vowel inventory, including length.

[5] Comparative works such as Brockelmann [1908] and Bergsträsser [1983] also mark the historically long vowels as long in Ethiopic, but this is likely intended simply to facilitate comparison with related languages; Moscati [1964: 165] explicitly bases the use of such notation "on etymological grounds".

(5) *The vowel system of Denais [1990] and others*

     i: ɨ   u:
     e: ʌ   o:
        a:

A basic difference between this approach and Pam's is that there is no pair of vowels distinguished purely by length: quantity is present in the phonology, but is secondarily determinable based on what qualitative features are present.[6] For example, the vowel /a:/ links to two timing positions—is required to be long—while /ʌ/ links to just one.

(6) *Vowel length in Denais [1990] and others*

    a. *Permitted*   X X   X
                          \/ |
                         a   ʌ

    b. *Prohibited*   * X X   * X
                          \/ |
                        ʌ   a

This analysis must stipulate the linking properties of the various vowels, or their component elements: essentially, any vowel bearing the feature [−back], [+low], or [+round] must be linked to two timing slots. In this approach, when /a:/ loses a timing slot due to closed-syllable shortening (§3), it must also lose its [+low] feature, thereby becoming /ʌ/. Such a redundancy, while easy to state, should be well motivated to justify its inclusion in the grammar, but I intend to demonstrate that the presence of length at all—whether redundant or distinctive—is itself problematic.

2. Tigrinya syllables and minimality

2.1. Syllable structure. In the traditional view, which I follow here, every Tigrinya syllable consists of a single onset consonant, a vowel in the nucleus, and an optional coda, yielding the two basic types CV and CVC [Leslau 1941: 14, Ullendorff 1955: 199, 203]. Lowenstamm and Prunet [1985: 204], Angoujard and Denais [1989: 99f], Denais [1990: 64] essentially agree but, since they include long

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[6] For Lowenstamm [1991: 962], the distinction between /ʌ/ and /a:/ is based on length and the relative **status** of the same features within the formal representation, rather than the literal presence or absence of particular features. This approach depends on techniques of the Charm and Government theory not adopted here.

vowels, admit the syllables CVV and CVVC as well.[7] I proceed here under the assumption that all vowels are phonologically short, and return below to the question of long vowels.

Some illustrative words, all forms of the verb √mskr 'witness', are given in (7); the templatic morphology characteristic of Semitic languages is responsible for the variety of vowel and syllable patterns. Periods indicate syllable breaks (which necessarily occur between any two adjacent consonants).

(7) *Tigrinya syllables*

    a. *mʌs.ki.rʌt*   'she witnessed' B 339

    b. *mʌs.kir.ka*   'you (m.sg.) witnessed' B 339

    c. *ni.mis.kir*   'we witness' B 339

    d. *tʌ.mʌ.sʌ.ka.ki.ra* 'she was witnessed several times' B 344

I adopt a moraic theory of the syllable [Hyman 1985, McCarthy and Prince 1986, Zec 1988, Hayes 1989]. The first mora dominates a vowel; the second mora dominates a coda consonant when one is present.

(8) *Syllable structure of* /mʌskirʌt/
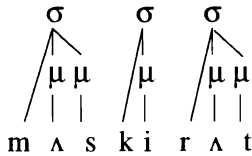
There are several reasons to treat closed syllables as heavy (bimoraic). First, it provides a way to represent a geminate consonant as in *ʔinno* 'mother': with an underlying mora. The mora occupies the coda of one syllable and the consonant spreads to the onset position of the following syllable, as illustrated in (9).

(9) *Syllabification of a geminate consonant*

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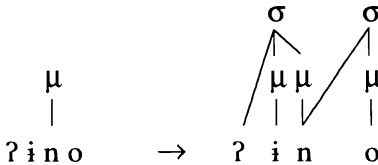
[7] Berhane [1991: 15] adopts from Kaye et al. [1990: 222] the more radical view that some Tigrinya 'codas' are actually onsets in CV syllables with empty nuclei. Pam [1973], following Chomsky and Halle [1968], does not employ the syllable as a formal device.

Second, the monomoraic–bimoraic distinction makes possible a prosodic represen-
tation of closed syllables in morphological templates [cf. McCarthy and Prince
1990: 35]. Finally, the use of moras is essential to the analysis of word minimality,
which is the subject of the next section.

2.2. Minimal word size. Important support for the moraic analysis of syllable
structure just presented is its ability to provide a simple explanation of word
minimality. The smallest lexical word in Tigrinya has the shape CVC (excluding
clitics; cf. Leslau [1941: 131]).

(10) *CVC words*

ʔid	'hand, arm'	lik̇	'scholar'
bun	'coffee'	lul	'pearl'
ker̓	'mercy'	t̓el	'goat'
dob	'border'	s̓or	'burden'
may	'water'	gʷal	'girl'
šiħ	'thousand'	sim	'name'
dʌm	'blood'	wʌz	'mien'

Conspicuously absent are words of the shape CV. That is, there are no words
such as *ʔi, *bu, *ge, etc. Besides being an exceptionless generalization about the
lexicon, there are at least two more active consequences of this restriction: lack of
vowel coalescence and presence of a final glottal stop. First, note that in a large
number of words, a central vowel /i, ʌ/ merges with a following glide to create a
single vowel (11) (see also §4). Further, Leslau [1941: 11] reports a number of
templatic forms in which the diphthong and monophthong are both possible; the
verb √ftw 'like' in (12) illustrates this.

(11) *Vowel coalescence*

a. bʌyt   →   b<u>e</u>t   'house' L 33
b. dʌrhʌw   →   dʌrh<u>o</u> 'chicken'
c. tinbiyt   →   tinb<u>it</u> 'prophecy' L 11
d. c̓ac̓iwt   →   c̓ac̓<u>ut</u> 'chick'

(12) *Optional vowel coalescence*

a. fʌtʌwka ~ fʌt<u>o</u>ka   'you (m.sg.) liked'
b. yiftʌw ~ yift<u>o</u>   'may he like'
c. yisʌttiw ~ yisʌtt<u>u</u> 'he likes'

While there are words which do not undergo coalescence (e.g., lʌyti 'night'), it
is quite a widespread pattern in the language. A systematic gap, however, is CVC
words where the final C is a glide. Synchronically, these do not coalesce even

optionally, and have failed to coalesce diachronically as well. A simple explanation for the impossibility of coalescence here is the general restriction against CV words: since the output of coalescence would be an ill-formed word, the rule is blocked.

(13) *Lack of coalescence in CVC*

|			
a.	čʌw	*čo	'salt'
b.	zʌy	*ze	'without'
c.	čiw	*ču	'buzz in ears' dB 941

    The second consequence of the restriction is the apparent insertion of a final glottal stop in words which would otherwise be CV. There are many words of the shape CVʔ, any number of which might have an origin of this type, but in general information about their history is not available. One example is *yaʔ*, indicating refusal. Quite interestingly, Bassano [1918] cites it in reduplicated form both with and without the glottal stop (*yaya* and *yaʔyaʔ*), but not in simple form without that final consonant (**ya*). Again, this gap makes sense if CV words as a class are prohibited.

    The lack of CV clearly cannot be due to a requirement that words (or stems) end in a consonant—as with Arabic nouns and verbs [McCarthy and Prince 1990: 14]—since there are many stems of the shape CVCV, which, of course, end in a vowel.

(14) *CVCV words*

siga	'meat'	dino	'fur hide'
gʌza	'house'	lomi	'today'
ħade	'one'	bota	'place'
resa	'corpse'	wari	'blackbird'
waga	'price'	gize	'time'
šahi	'tea'	ħuša	'sand'

    What is it that the licit shapes CVC and CVCV have in common but which distinguishes them from unattested CV? Under the moraic analysis given above, both permitted types are bimoraic. Monomoraic CV in (15c) is rejected since it does not meet the two-mora minimum. This is a well established minimal word size, found in a large number of languages (see McCarthy and Prince [1995: 321f] and references therein). Consequently, this analysis of the Tigrinya pattern has strong cross-linguistic precedent. The parallel status of CVC and CVCV offers excellent evidence that a coda consonant renders a syllable heavy, yielding the two moras necessary to form a proper word (15a). The alternative means of achieving the same minimum is with two open syllables, each of which provides one mora (15b). Of course, much longer words are possible (as illustrated in §1), but all words must contain at least two moras, which means that CV is excluded (15c).

(15) *Minimal words*

a.   σ   b.   σ   σ   c.   * σ

      μ μ   μ   μ   μ

     C V C   C V   C V   C V
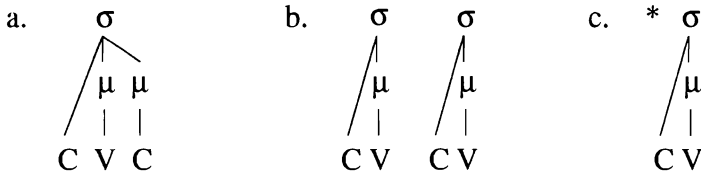
    Throughout this discussion I have treated all vowels as short, i.e., monomoraic. What if there are in fact phonologically long vowels in Tigrinya? Since long vowels are by definition bimoraic, a word of the shape CVV should meet the two-mora minimal word size. However, adding length marks does not alter the fact that words such as hypothetical *ʔi: and *bu: are impossible. Thus, the vowel inventory in (5) makes a false prediction regarding a pervasive property of Tigrinya word size, while the moraic analysis outlined above captures the facts quite easily, if every vowel is short.[8]

(16) *Another minimal word?*

        σ

      μ μ

     C   V

    What then motivates the quantitative approach in (5)? There is one significant pattern which might support the claim of phonological vowel length: apparent closed-syllable shortening alternations which correspond to historical vowel length, e.g., [ʌ]~[a] corresponding to *a~*a:. I argue in the next section that such 'shortening' is extremely limited in scope, and the assumptions necessary to analyze it as actual synchronic shortening make false predictions for more pervasive patterns in the language. In other words, these alternations simply cannot be treated with synchronic length in an analysis which takes account of the full range of data in the modern language.

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[8] Denais [1990: 65] notes that words with the shape CʌC and CɨC are uncommon, and often related (synchronically or diachronically) to triliteral roots. For example, the plural of *šig* 'torch' is *ʔa-šyag*, indicating the root √šyg. However, the fact remains that CVC words with /ʌ, ɨ/ are permitted, while ostensible CVV words are not. He offers no explanation for this asymmetry. Compare Arabic, where minimality (two moras excluding a final consonant) leads to forms such as colloquial Palestinian *baas*, *bass*, and *basi* from English 'bus' [McCarthy and Prince 1990: 21, citing Ellen Broselow]; these words reflect three strategies for achieving the same bimoraic goal.
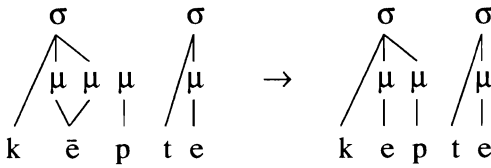
3. Closed-syllable shortening?

The well known process of closed-syllable shortening, as the name suggests, shortens a long vowel when it occurs in a closed syllable [cf. Kisseberth 1970: 297, Clements and Keyser 1983: 61, Myers 1987]. Shortening of this type occurred in Middle English, and has led to modern alternations as in *keep~kept* [Luick 1921: 324, Jesperson 1954: 120]; subsequently, the unstressed final vowel was lost, leading to the modern situation (17). Such alternations are easily attributed to a limit of two moras per syllable: the coda consonant requires a mora for itself, so the long vowel must give up one of its moras, thereby becoming short (by definition).

(17) *Middle English closed-syllable shortening*
  a. kēp-e   →   kē.pe
  b. kēp-te   →   kep.te

(18) *The operation of closed-syllable shortening*

If closed-syllable shortening could be motivated for Tigrinya, it would be strong support for the inclusion of vowel length in the phonology. Two contexts have been put forth in support of this claim, in the broken plural and in suffixation. As we shall see, however, these processes are extremely limited in nature and should not be treated synchronically as shortening.

3.1. The broken plural. Like other Semitic languages, Tigrinya forms the plurals of some nouns by suffixation—'sound' plurals most often with *-(t)at* (cf. (62) below)—and others by internal changes to the stem, referred to as 'broken' plurals, which may or may not be accompanied by affixes. Two common patterns are triliteral *ʔa-CCaC* and quadriliteral *CʌCaCɨC* [Leslau 1941: 32f].

(19) *Triliteral broken plurals*

	Singular	Plural	Gloss
a.	*gʌmʌl*	*ʔa-gmal*	'camel'
b.	*bɨrki*	*ʔa-brak*	'knee'
c.	*bet*	*ʔa-byat*	'house'

(20) *Quadriliteral broken plurals*

	Singular	Plural	Gloss
a.	ƙʌrnʌb	ƙʌranib	'eyelash'
b.	mʌflʌs	mʌfalis	'boar'
c.	mʌnbʌr	mʌnabir	'seat'

Palmer [1955, 1957] gives two different quadriliteral plural patterns: not only CʌCaCiC (20) but also CʌCʌCCiC (21) with a geminate consonant and /ʌ/ rather than /a/ before the geminate. If /ʌ/ is a short vowel, /a/ is long, and the first half of the geminate occupies a mora in the preceding syllable (as shown in (9)), then plural 2 looks like the result of a rule which geminates the penultimate consonant, with subsequent (and automatic) shortening of /a/ in a closed syllable.

(21) *Alternate quadriliteral broken plurals*

	Singular	Plural 1	Plural 2	Gloss
a.	mʌnkʌs	mʌnakis	mʌnʌkkis	'chin'
b.	kʌnfʌr	kʌnafir	kʌnʌffir	'lip'
c.	finjal	fʌnajil	fʌnʌjjil	'cup'
d.	harmaz	haramiz	harʌmmiz	'elephant'

There is, however, good reason to doubt the generality of this process in Tigrinya. First, the data. The earliest discussion of this pattern I know of is Palmer's. Leslau's [1941] grammar makes no mention of form 2, and in the large dictionary of Bassano [1918], I found only one such plural listed (*kʌnʌttib* 'provincial heads'). Several Tigrinya speakers whom I consulted did not recognize form 2 as a possible variant, though see also (24) below. More recent citations of these alternations [Angoujard and Denais 1989: 115, Denais 1990: 252] make no comment on the curious absence of the pattern from many sources. Since the specific words they cite are all present in Palmer's work, it is unclear whether they were able to re-elicit the data from other speakers, or simply relied on Palmer.

The geminated form 2 is, in fact, identical to a basic broken plural template in the closely related language Tigre [Raz 1983: 19f; see also Palmer 1962: 24ff]. In Tigre, the two basic forms illustrated in (21) are possible, but only one is chosen for each noun of this type (see (21) and (22); the transcription is adapted to that used in this paper). This similarity, combined with the lack of attestation in many sources, suggests that the form is borrowed from Tigre. Palmer's Tigrinya consultant, who supplied the data in (21), was from the Hamasen region in Eritrea, a part of the Tigrinya-speaking area not far from the Tigre-speaking area.

(22) *The Tigre quadriliteral broken plural, Type 1*

Singular	Plural	Gloss
a. *kirbaj*	*kʌrʌbbij*	'whip'
b. *k̓ilc̓im*	*k̓ʌlʌc̓c̓im*	'wrist'
c. *šingul*	*šʌnʌggil*	'adult'

(23) *The Tigre quadriliteral broken plural, Type 2*

Singular	Plural	Gloss
a. *misk̓al*	*mʌsak̓il*	'instrument for suspending'
b. *miwik̓k̓al*	*mʌwak̓il*	'high place'
c. *dingil*	*dʌnagil*	'virgin'

My consulant MM—also from Hamasen—offered the following plural forms for the words in (21). Alternatives such as *kʌnafir* were recognized but not considered proper.

(24) *One Tigrinya speaker's broken plurals*

Singular	Plural	Gloss
a. *mʌnkʌs*	*mʌnakkis*	'chin'
b. *kʌnfʌr*	*kʌnʌffir*	'lip'
c. *finjal*	*fʌnʌjjil*	'cup'
d. *ḥarmaz*	*ḥarʌmmiz*	'elephant'

In part, this confirms Palmer's data. But the plural for 'chin', *mʌnakkis*, is striking: it has gemination **and** the vowel /a/. This contradicts the closed-syllable shortening analysis, but is precisely what we might expect to find if the choice between /ʌ, a/ and the presence of gemination are, in modern Tigrinya, independent. It presents an obvious difficulty for the length-based approach, given the putative long vowel in the closed syllable.

The presence of /a/ before the final syllable of the word is a pervasive feature of Tigrinya plurals [cf. Angoujard and Denais 1989: 108], even without other vowel changes in the stem as in the template CʌCaCiC. Many of these plurals also include the suffix *-u*, replacing another suffix present in the singular.

(25) *Plurals with infixed /a/*

Singular	Plural	Gloss
a. *kursi*	*kurasi*	'armchair'
b. *dingil*	*dinagil*	'virgin' L 36
c. *mʌsʌguf*	*mʌsʌgaguf*	'wild sage' dL 49

(26) *Plurals with infixed /a/ and suffix* -u

a.	*dang-a*	*da<u>na</u>g-u*	'calf (of leg)'
b.	*kʷatr-a*	*kʷat<u>a</u>r-u*	'pigeon' FP 559
c.	*mʌ ʕanɬ-a*	*mʌ ʕan<u>a</u>ɬ-u*	'intestine'
d.	*ǩiċċ-a*	*ǩiċ<u>a</u>ċ-u*	'bread' dB 280
e.	*sirr-e*	*si<u>ra</u>r-u*	'pants' L 34
f.	*karibb-o*	*karib<u>a</u>b-u*	'small skin bag' dL 47
g.	*komor-ot*	*komo<u>ra</u>r-u*	'fee' dL 47

Apparently, this /a/ pattern has been imposed on *mʌnakkis* (24), but without loss of the gemination. I conjecture that new the plural template *CʌCʌCCiC* was (in some dialects) borrowed wholesale from Tigre. It differs from the basic template in two respects: the medial vowel and gemination. Once borrowed, it is possible for these two properties to be dissociated—but only if what we observe is not actually closed-syllable shortening.[9] In fact, *mʌnakkis* reflects a regularization, where one of the borrowed properties—the vowel quality—has reverted to the native norm. This result is not at all surprising if /a/ is short, but the existence of such a form is mysterious if the vowel is long.

3.2. 'Long' vowels in closed syllables. Pam [1973: 54] notes that his abstract vowel inventory incorporating length is based on "what is admittedly, in terms of productive processes, a limited area of Tigrinya morphology." Not only are the relevant data quite restricted in nature, but I present evidence that wider patterns in the language contradict the predictions of the quantitative approach.

I suggested in the previous section that the broken plural alternates in (21) are a matter of template choice, rather than active closed-syllable shortening. Another reason for this conclusion is that there are many cases of the ostensible long vowel /a/ in closed syllables. Words of the shape *CaC* are given in (10) above; I give in (27) below instances in longer words. These data defy references to, for example, "la non apparition de [a] en syllabe fermée" [Angoujard and Denais 1989: 103; cf. also Lowenstamm and Prunet 1985: 204]. The absence of [a] in a closed syllable is indeed predicted by their assumption of vowel length, but this is clearly not borne out.[10]

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[9] Even in Tigre there is evidence against an active closed-syllable shortening analysis. For example, a related broken plural has the two forms *ʔʌCaCiC*, e.g., *ʔʌwalid* 'daughters', and *ʔʌCʌCCiC*, e.g., *ʔʌbʌllis* 'figs' [Raz 1983: 19]. In contrast, 'swords' is *ʔʌsʌyif*. The lack of gemination is due to the fact that glides cannot be geminate in Tigre, but then why the 'short' vowel [ʌ] before it? If the vowel is simply specified in the template (as I propose for Tigrinya), such a form is no surprise.

[10] Palmer [1958: 134f] essentially assumes the mixed inventory in (5), with five long vowels: "The long vowels are, with rare exceptions, found in closed syllables *only* when these are word-

(27) *Vowel /a/ in closed syllables*

šʌlm*a*t	'darkness'	s*a*nbuʔ	'lung'
šʌm*a*lya	'convalescent'	ƙ*a*lsi	'struggle'
d*a*nga	'leg'	ƙ*a*nza	'pain'
m*a*ntille	'rabbit'	ƙ*a*flay	'caravan'
b*a*rya	'slave'	ƙʷ*a*nƙʷa	'language'
s*a*lsay	'third'	g*a*nta	'team'

Similar examples in closed syllables are shown in (28) for the other vowels treated as long in the mixed inventory in (5). See also the CVC words in §2.2, and suffixed stems in (41). For [e] in a non-final closed syllable, see the vowel coalescence examples in (53) to (55) below.

(28) *'Long' vowels in closed syllables*

bal*i*ƙƙa	'cork'	ʕ*i*llu	'young donkey'
b*i*lƙat	'squat glass jar'	hab*o*bla	'hurricane'
b*u*rdo	'pure food'	ƙor*o*nfo	'dried fig'
b*u*rkuta	'spherical bread'	b*o*sso	'barley porridge'
g*u*ndi	'tree trunk, pole'	r*o*bra	'seagull'

Another source of /a/ before a geminate is verbs of the morphological category known as Type B, whose basic characteristic is gemination of the middle consonant [Leslau 1941: 95, Berhane 1991: 176f]. An example is √bdl 'offend'. (The perfective suffix /ʌ/ surfaces as [e] due to a rule of Fronting in final position; see §5.1.)

(29) *The Type B verb*

perfective	*bʌddʌl-e*	imperfective	*yi-biddil*
gerundive	*bʌddil-u*	infinitive	*mi-biddal*

The frequentative forms reported by Berhane [1991] do not have gemination, e.g., *bʌdadʌl-e* (see (72)). Here the inserted /a/ vowel essentially splits the geminate. Leslau [1941: 97], however, reports alternate forms with and without gemination, and in the alternate there is no change in the preceding /a/ vowel. The sequence /aCC/ stands in conspicuous contrast to the plural template CʌCʌCCiC in (21), and is similar to the plural *mʌnakkis* (24).

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final." While words like those in (28) are relatively uncommon, I do not consider them to be exceptions, i.e., violations of the basic phonotactics of the language; rather, the lexicon and morphology inevitably reflect their origin in an earlier state of the language where length was real. Further, as Palmer notes, "the frequent occurrence of an open [i.e. low] vowel in non-final closed syllables makes it necessary to place *a* in both the short and the long vowel classes." Thus, Palmer has eight vowels, including /a/ and /a:/. This complicating move is unnecessary if synchronic vowel length is abandoned.

(30) *Optional gemination in the Type B frequentative*
    a. ʕak̯ak̯ʌn-e   'he tested several times'
    b. ʕak̯ak̯k̯ʌn-e   (same)

(31) *Consistent gemination in the Type B frequentative*
    a. yi-bbʌdaddʌl   'he offends several times'
    b. bʌdaddil-u   'he offended several times'

Kenstowicz [1982: 116] gives passive forms of the verb in (31) which similarly include gemination after /a/. I have seen no attestation of 'shortened' [ʌ] in the penult of a frequentative verb, as the closed-syllable shortening analysis predicts. On the other hand, this absence is exactly what we should expect if 'shortening' in the broken plural is really the result of a difference in templates.

Another pertinent example against closed-syllable shortening is the adjectival suffix *-am* (32), forming adjectives from noun stems with the general meaning 'plein de, pourvu de quelque chose en abondance' [Leslau 1941: 20].

(32) *The suffix* -am
    a. čʌrk̯i   'rags'
         čʌrk̯-am   'beggar'
    b. lʌmši   'leprosy' dB 19
         lʌmš-am   'leprous'
    c. mʌrzi   'poison' dB 86
         mʌrz-am   'poisonous'

This suffix has a variant *-amma* (33), which sometimes includes in its meaning 'une note de pitié'.

(33) *The suffix* -amma
    a. čʌrk̯i   'rags'
         čʌrk̯-amma   'poor beggar'
    b. lʌmši   'leprosy'
         lʌmš-amma   'poor leper, pariah'
    c. ṭʌnk̯i   'hatred, misfortune' dB 914
         ṭʌnk̯-amma   'bad, harmful'

The longer variant entails gemination of the /m/ of the basic suffix—just as the Tigre-style variant of the broken plural involves gemination of the penultimate consonant — but in this case there is no change in the proceeding vowel. Similarly and strikingly, Leslau [1941: 19] gives 'intensive' forms of the adjective template *CʌCCaC* which are formed by adding *-a* and geminating the stem-final consonant. Again, there is no change in the /a/ of the stem as a result of the consonant

gemination, despite the essential identity of this phonological context with that in the broken plural data in (21).

(34) *Gemination before the suffix* -a
    a. *gʷʌlmass-a*   'robust'
    b. *gʷʌlbatt-a*   (same)
    c. *lʌflaff-a*   'talkative, gossipy'

These data from gemination in the frequentative, in the suffix *-am(ma)*, and in stems preceding the suffix *-a* all indicate that the supposed closed-syllable shortening found in the broken plural is by no means the general case in Tigrinya, and to treat it as an automatic phonological process is poorly motivated. Rather, the quite limited alternation between *CʌCaCiC* and *CʌCʌCCiC* does not support the inclusion of vowel length in the phonology of Tigrinya, and should be analyzed in a way which captures its ad hoc character—namely, by a simple choice between the two templates, one with /a/ and the other with /ʌ/ (or sometimes /a/) and a geminate consonant. This approach is discussed further in §3.4.

3.3. The suffix *-t*. Plural type 2 may be borrowed from Tigre, but an unambiguously native case of ostensible closed-syllable shortening comes from the suffix *-t*, which is used primarily to mark feminine gender and plural number. Due to epenthesis, this suffix appears as [ti] when added to a consonant-final stem (35c).

(35) *The suffix* -t
    a. *midr-awi*   'earthly (m.sg.)' D 114
         midr-awi-t   'earthly (f.sg.)' D 114
    b. *kʌfat-i*   '(man) who opens' L 28
         kʌfat-i-t   '(woman) who opens' L 28
    c. *mʌ-k̓ʌ̌f-i*   'scissors (sg.)' L 35
         mʌ-k̓ʌ̌f-ti   'scissors (pl.)' L 35

Before the *-t* suffix, the vowel in the stem-final syllable can undergo a change. In particular, /a/ alternates with [ʌ] in three contexts. (The form [di] occurs by assimilation after /d/-final stems [Leslau 1941: 14].)

(36) *The alternation* a~ʌ *in adjectives*
    a. *rʌk̓k̓ak̓*   'thin, fine (f.sg.)' L 29
         rʌk̓k̓ʌk̓-ti   'thin, fine (pl.)' L 35
    b. *ħaddas*   'new (f.sg.)'
         ħaddʌs-ti   'new (pl.)' L 35
    c. *kʌbbad*   'heavy (f.sg.)'
         kʌbbʌd-di   'heavy (pl.)' L 35

(37) *The alternation* a~ʌ *in agentives*
  a.   wʌlad-i   'parent' L 35
       wʌlʌd-di   'parents' L 35
  b.   ʔagʌlgal-i   'servant (m.)' L 35
       ʔagʌlgʌl-ti   'servants' L 35
  c.   ǩʌllab-i   'one who feeds'
       ǩʌllʌb-ti   'those who feed' L 35
  d.   ǩʌšaš-i   'cheater'
       ǩʌšʌš-ti   'cheaters'

(38) *The alternation* a~ʌ *in the suffix* -ay
  a.   ʔamħar-ay   'Amhara man' L 28
       ʔamħar-ʌy-ti   'Amhara woman' L 28
  b.   ħamasen-ay   'man from Hamasen' L 21
       ħamasen-ʌy-ti   'woman from Hamasen'
  c.   sals-ay   'third (m.)' L 28
       sals-ʌy-ti   'third (f.)' L 28
  d.   taħt-aw-ay   'lower (m.)' L 28
       taħt-aw-ʌy-ti   'lower (f.)' L 28

This change is phonologically the same as discussed for the broken plural (§3.1). A somewhat more limited alternation, since the necessary context is less common, shows /u/ alternating with [i].

(39) *The alternation* u~i *in passive participles*
  a.   nigus   'king' D 221
       nigis-ti   'queen' D 221
  b.   ħimum   'sick (m.)' L 28
       ħimim-ti   'sick (f.)' L 28
  c.   šibbuǩ   'good, beautiful (m.)' L 28
       šibbiǩ-ti   'good, beautiful (f.)' L 28

(40) *The alternation* u~i *in the plural suffix* -ut
       mirak-ut   'calves' L 36
       mirak-it-ti   'calves' [variant] L 36

This alternation, of course, corresponds to the historical centralization shown in (3c), applying to the apparent result of closed-syllable shortening: /u:/ → [u] → [i]. An analysis which accepts modern phonological length can treat this as synchronic shortening as well: in the closed syllable, the vowel shortens and undergoes centralization [Pam 1973: 49f]; or any vowel feature which requires a branching nucleus is forced to delink [Denais 1990: 221f, Lowenstamm 1991: 963]. I am not

aware of any examples of [i] alternating with [ɨ] in a closed syllable, though that possibility is certainly predicted by the quantitative approaches.[11]

The suffix -*t* is the only one which triggers these changes: other suffixes (41) leave a supposed 'long' vowel in the preceding syllable intact (even with the same roots and clusters illustrated above). Since 'length' is preserved in word-final syllables and in word-internal syllables before other suffixes, it must be some special property of the suffix -*t* that triggers these vowel alternations.

(41) *Lack of 'shortening' with other suffixes*

ǩʌt̪il-na̱-yyo	'we killed him'
rʌkib-u̱-nni	'he found me'
ʔid̪-ki	'your hand (f.sg.)'
nigu̱s-ka	'your king (m.sg.)' D 256
sasu̱n-kin	'your box (f.pl.)'
t̪el-na	'our goat'
ʔa-ʔda̱w-kum	'your hands (m.pl.)'
su̱ǩ-ta	'silence' L 24

For Pam [1973: 53] and Denais [1990: 220ff, 256f], the special status of -*t* follows from its shape as a single consonant, as opposed to the other suffixes, which all contain a vowel. For Pam, the mechanism is rule ordering. His rule of Vowel Shortening (42) refers specifically to a vowel followed by two consonants at the end of the word. This rule crucially applies before Epenthesis, which removes part of the environment necessary for proper application (since the final vowel means that the consonant cluster is not word-final). If Epenthesis applied before Shortening, then intermediate *nigus-ti* ought to behave like *nigus-ka*, with no change in the /u/; but this is incorrect, so the opposite ('counterbleeding') ordering is necessary.

(42) *Vowel Shortening* (Pam 1973: 49)

V → [−long] / ___CC#

(43) | *Suffixation* | nigus-t | nigus-ka |
|---|---|---|
| *Vowel Shortening* | nigɨs-t | — |
| *Epenthesis* | nigɨs-ti | — |

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[11] For Denais [1990: 297ff], all shortening results in [ɨ], but this can later become [ʌ] by 'propagation' of the [low] feature from an adjacent /a/ or /ʌ/. Thus, he actually derives the plurals in (36) from masc.sg. stems such as ǩʌt̪in (see (48)). He does not discuss the form ħamasen-ʌy-ti (38), where the preceding vowel is /e/. Pam [1973: 49] treats the vowel alternation in nʌbiy 'prophet' and ti-nbiy-ti 'prophecy' as the result of shortening. I propose in §3.4, however, that this pattern be treated as templatic.

Two objections can be raised to this approach. One is quite simply that the analysis depends on opaque rule ordering: there are many strong arguments against intermediate stages in the derivation (see Prince and Smolensky [to appear] for an influential recent approach as well as references to earlier work). In the alternative that I develop below in §3.4, there is no crucial appeal to unattested intermediate representations.

The second objection to Pam's approach is that the environment for Shortening (42) is quite ad hoc: it essentially refers to a 'superheavy' word-final syllable, rather than any closed syllable as in Middle English (17) and other languages with productive closed-syllable shortening. More specifically, it is a stipulative account of shortening since it does not refer to syllable structure, just to a consonant cluster. (This rule also cannot account for the shortening in the broken plural, but Pam is among the many who do not mention such data.) A less stipulative alternative to explicit reference to a final consonant cluster is that final consonants are extra-syllabic (excluded from syllable structure), so that at the relevant stage of the derivation the actual syllables are as follows [cf. also Lowenstamm and Prunet 1985: 204].

(44) *Final-consonant extrasyllabicity*

    a. nɨ.gu<s>

    b. nɨ.gus<t>   →   nɨ.gis<t>

This approach to syllable structure is well-motivated in languages like Arabic, where final syllables clearly do pattern differently from other syllables: only in that position are superheavy syllables permitted (i.e., CVCC and CVVC); among monosyllables, word minimality is not satisfied by CVC, only by CVVC or CVCC; and a final CVC syllable is treated as light for stress placement, just like CV. All of these phenomena can be explained by one assumption, namely that the final C is not part of the syllable (see, for example, McCarthy and Prince 1990: 14, Hayes 1995: 68). In Tigrinya, on the other hand, such facts do not hold: syllable types are the same in final and non-final positions, and a final C is included in the deter-mination of minimality (§2.2).[12] And extrasyllabicity is of no help in capturing the contrast between (intermediate) *nigus-t* and *nigus-ka*, since the stem-final /s/ in *nigus-ka* is not word-final, and by the Peripherality Condition [Hayes 1982: 270, Harris 1983: 105f] it cannot be extrasyllabic.

Denais [1990] takes an approach which resembles Pam's in some respects. The idea is that because it does not contain a vowel, *-t* is prosodically defective, and unable to form a prosodic constituent of its own; it combines in the same prosodic

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[12] As Ullendorff [1955: 194] notes, "stress in Tigrinya falls almost invariably on the last syllable" (see also Leslau 1941: 15). The lack of a clear metrical stress system means that the third property which supports final extrasyllabicity in Arabic cannot be tested for Tigrinya; but certainly, stress placement provides no motivation for it in Tigrinya.

word as the preceding material (the stem). Other suffixes, however, form indepen-dent prosodic words, marked here with square brackets.[13]

(45) *Prosodic word structure* [Denais 1990]
 a. [nigus] [ka] → *niguska*
 b. [nigust] → *nigist* (→ *nigisti*)

If shortening occurs before two-consonant clusters located at the end of a prosodic word, then it applies apply only before *-t*, and not before suffixes such as *-ka*.[14] Like Pam, Denais makes stipulative reference to a word-final cluster, as well as an intermediate stage (before Epenthesis) at which the /t/ is prosodically incomplete. In addition, complications arise in the case of vowel-initial suffixes, as in sʌb-*at* 'person-PLUR': since the suffix contains a vowel, will it be an independent word, but one without an onset? The most important objection, however, is that *-t* is the unique suffix which motivates this distinction. There is little justification for attributing its special status to its prosodic shape when there are no other suffixes of the same shape to test this correlation. And, of course, this analysis requires the phonological presence of vowel length, which is in general problematic.

3.4. Alternatives to shortening. If we reject length in Tigrinya, we must still provide an analysis of the vowel alternations before *-t* in (36) to (40). There are two possibilities. One is to stipulate as a property of the suffix *-t* that only the feature [high] is licensed in the preceding syllable, or (equivalently) that contrasts involving [low], [back], and [round] are prohibited there [cf. Steriade 1995: 158f]. Such centralization in a closed syllable is a perfectly natural process; parallel cases can, for example, be found in closed-syllable laxing of (high) vowels in Quebecois French [Dumas 1987: 92f] and Javanese [Horne 1974: xi-xii]. I do not dwell on this approach since I turn now to what I consider to be a preferable analysis.

Whatever the general motivation of closed-syllable centralization might be, it is essential to remember that in Tigrinya this is not a general process; rather, it occurs just before *-t.* The only other context for centralization is the dubious example of the broken plural alternate discussed in §3.1, but I have already suggested that this should be treated as a different choice of template, as shown in (46). In this view,

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[13] Denais [1990: 256] states that "la suffixation de /ka/ est celle d'une unité prosodique complète dont on déduit l'autonomie phonologique de deux unités. En revanche, la suffixation de /t/ est celle d'une unité incomplète et de ce fait induit un processus d'ajustement, en l'occurrence de réduction vocalique; /t/ constitue la quatrième consonne d'un seul 'mot' phonologique."

[14] In the Charm and Government terms employed by Denais [1990: 221], vowel shortening is the result of "l'agrammalité de la suite finale de trois creux." Each syllable contains a sonority peak (*sommet*); the second half of a long vowel is a trough (*creux*), as is any consonant. Thus the sequence /u:st/ is a peak plus three troughs, and vowel reduction consists of removing the first trough, creating a short central vowel in [ist].

the vowel quality /ʌ/ is listed as a property of the template, and synchronically is not attributable to the following geminate. This approach freely accommodates the additional alternate *CʌCaCCiC*, which differs from the basic plural only in gemination, not in vocalism.

(46)   *quadriliteral plural*   CʌCaCiC   *e.g., mʌfalis*   'boar'
        dialectal variant   CʌCʌCCiC   *e.g., mʌnʌkkis* 'chin'

The templatic analysis of the broken plural leads us to an additional possibility for 'shortening' before -*t*, namely that the vowel change has been morphologized as a new template or vocalism which co-occurs with the suffix -*t*. In support of this position is the highly significant fact that all the examples of supposed closed-syllable shortening (including the broken plural) are in a small set of templates: we do not find -*t* added to a non-templatic stem, and therefore no apparent shortening occurs in non-templatic contexts.[15] For example, among adjectives it is only those which have the templatic shape CVCCVC which form their plural in -*t*. Other adjectives take different plural suffixes which induce no change internal to the stem, e.g., *habtam-at* 'rich', *sadik̓-an* 'just' [Leslau 1941: 31].

Surely this restricted morphological distribution is no coincidence. We can therefore treat the marking of the plural and feminine as a difference in suffix **and** template. For example, the agentives in (37) are based on the following template-suffix combinations.

(47)   *m.sg. agentive*   CʌCaC-i   *e.g., k̓ʌtali*   'murderer'
        f.sg. agentive   CʌCaC-i-t   *e.g., k̓ʌtalit*
        pl. agentive   CʌCʌC-t   *e.g., k̓ʌtʌlti*

Similarly, adjectives (36) and passive participles (39) result from the association of root consonants to the following templates.

(48)   *m.sg. adjective*   CaCCiC   *e.g., s̓ʌllim*   'black'
        f.sg. adjective   CʌCCaC   *e.g., s̓ʌllam*
        pl. adjective   CʌCCʌC-t   *e.g., s̓ʌllʌmti*

(49)   *m.sg. passive participle*   CiCuC   *e.g., himum*   'sick'
        f.sg. passive participle   CiCiC-t   *e.g., himimti*

Finally, the only regular occurrence of -*t* not immediately following a template is with the ethnonymic (and adjectival) suffix illustrated by -*ay/-ʌyti* (38). Here, too, the /t/ can be reconceptualized as co-occurring with the appropriate vowel underlyingly. That is, the feminine [ʌyti] is not a concatenation of the masculine

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[15] The only non-templatic example I know of is *haw-ti* 'sister', derived from *haw* 'brother'. No vowel change occurs, but this could be attributed to the word-initial guttural (§5.3).

/ay/ plus feminine /t/, with a resultant vowel change, but rather a single element /ʌyt/. Its status is then parallel to the plural suffix /ot/, which is unanalyzed into component parts.

(50) *male ethnonym*   -ay   *e.g.*, ʔamħaray 'Amhara'
     female ethnonym   -ʌyt   *e.g.*, ʔamħarʌyti
     plural ethnonym   -ot   *e.g.*, ʔamħarot

In this approach, of course, the quality of the feminine vowel /ʌ/ is not derived from masculine /a/, any more than the quality of plural /o/ is derived. We correctly predict that apparent shortening is restricted to specific morphological categories, and that no general rule will shorten vowels in closed syllables. The same unitary analysis can be given to the plural suffix *-itti* illustrated in (40), reinforcing its relationship to the plural suffix *-witti* [Leslau 1941: 34f].

In addition to the broken plural, a more direct analogy for treating the alternating stems before *-t* as different templates is found in the 'abstract noun' template *ti-CCiC-t* [Leslau 1941: 25]. While the stem-final syllable of this template has a 'short' vowel, this clearly must be a distinct template (not just affixation and shortening), since the stems to which these nouns are related can have a variety of vocalisms and syllabic patterns.[16]

(51) *The abstract noun template*
    a. *ti-ʕgis-ti*   'patience'
       ʕiggus   'patient'
    b. *ti-ħrif-ti*   'greed, strong desire'
       ħirfi   'greed, gluttony'
    c. *ti-mħir-ti*   'education'
       mʌhar-i   'instructor'
    d. *ti-ħki-t*   'laziness'
       ħakkay   'lazy'
    e. *ti-nbi-t*   'prophecy'
       nʌbiy   'prophet (m.)'

The appropriate description of the relationship between pairs such as *ʕiggus* and *ti-ʕgis-ti* is not that one is derived from the other by affixation, but rather that both are derived from an abstract consonantal root √ʕgs which associates to a particular template depending on the morphological properties of the intended word: for the

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[16] As is typical in Tigrinya, the last two forms, *ti-ħki-t* and *ti-nbi-t*, show [i] for expected [iy], and thus require no final epenthesis. This can be treated either as coalescence of /i/ and /y/, or as linking of the glide to an empty syllable nucleus, with realization as [i]. See Buckley [1994] for more discussion. For 'prophecy' Bassano [1918] gives *ti-nbiy-ti*, without coalescence, recalling the cases illustrated in (12) where coalescence is optional.

adjective the template is unaffixed *CiCCuC*, while for the abstract noun it is *ti-CCiC-t*, with a prefix and suffix. The templates in (47) and (48) are thus formally of the same category as *ti-CCiC-t*: a templatic shape with particular additional properties such as vocalism and co-occurring affixes; compare also the plural template *ʔa-CCaC* (19), which always occurs with a prefix. The presence of a central vowel /ʌ/ or /i/ in the template may be a morphologization of the pattern which resulted historically from closed-syllable shortening, but is not attributable to an active phonological process in the modern language. In addition, the proposed reanalysis of 'shortening' has the advantage of treating this empirically marked pattern as formally marked as well, rather than (falsely) as the general situation predicted by the quantitative analysis.

4. Vowel coalesence

Pam [1973], starting from the abstract vowel inventory in (4), derives the synchronic mid vowels [e, o] from coalescence of a short vowel with a glide. While I include mid vowels in the underlying inventory—an assumption shared even in the quantitative inventory of (5)—it is clear that coalescence is a synchronically active part of Tigrinya phonology. The essential pattern is shown in (52); see Buckley [1994] for more extensive discussion and analysis.

(52) *Schematic vowel coalescences*

/ʌy/	→	e
/ʌw/	→	o
/iy/	→	i
/iw/	→	u

There are two ways in which coalescence is relevant to the question of vowel length. First, the following examples provide important evidence that the mid vowels which result from it are short. These words are all gerundive verbs (stem template *CʌCiC*) with a medial /y/ in the root.

(53) *Coalescence with √kyd*

a.	/kʌyid-na/	→	kʌydna	→	*ked.na*	'we went'
b.	/kʌyid-u/	→	kʌydu	→	*kʌy.du*	'he went' L 119

(54) *Coalescence with √šyr*

a.	/šʌyir-na/	→	šʌyrna	→	*šer.na*	'we carried'
b.	/šʌyir-a/	→	šʌyra	→	*šʌy.ra*	'she carried'

(55) *Coalescence with* √šyɨ

    a. /šʌyɨl-na/ → šʌyɨna → šeɫna   'we sold' B 284
        /šʌyɨl-ka/ → šʌyɨka → šeɫka   'you (m.sg.) sold' B 284
        /šʌyɨl-kɨn/ → šʌyɨkɨn → šeɫ.kɨn   'you (f.pl.) sold' B 284
    b. /šʌyɨl-u/ → šʌyɨu → šʌy.ɫu   'he sold' B 284
        /šʌyɨl-a/ → šʌyɨa → šʌy.ɫa   'she sold' B 284
        /šʌyɨl-om/ → šʌyɨom → šʌy.ɫom   'they (m.pl.) sold' B 284

In all words, /yi/ coalesces to [y] as the first step.[17] We saw in (12) that coalescence has at least some optionality; for example, *kedu* is a possible alternate for *kʌydu* (53b). But coalescence is obligatory before a cluster, as in *kedna*. The ill-formedness of **kʌydna* makes sense if the superheavy (trimoraic) rime [ʌyd] is prohibited; but if vowel length is phonological, why isn't [e:d] also prohibited? The answer, quite simply, is that there are no long vowels in Tigrinya, and the rime [ed] is only bimoraic. In other words, [ed] and [ʌy] are equivalent from the standpoint of syllable structure, and therefore [e] and [ʌ] are also equivalent: they are both short vowels.[18]

Further important evidence regarding length comes from cases where /ʌ/ combines with other vowels. Note first that if the coalescence of a 'short' vowel like /ʌ/ with a glide results in a 'long' vowel, then it would appear that the number of timing slots (whether x's or moras) present in the input is preserved in the output (56).

(56) *Coalescence to a long vowel*

$$
\begin{array}{ccc}
\text{X X} & \rightarrow & \text{X X} \\
| \quad | & & \diagdown\!\diagup \\
\text{ʌ} \quad \text{y} & & \text{e}
\end{array}
$$

To the extent that all outputs of coalescence are long vowels, then, this phenomenon might be taken as support for the incorporation of length into the analysis. However, we see from the examples in (57)-(58) that when /ʌ/ combines with a non-high vowel, the stem-final vowel surfaces unchanged. Each (a) example shows a case without coalescence. Most importantly, the (e) examples show that the combination /ʌ/ plus /ʌ/ results in 'short' [ʌ], not a 'long' vowel such as [a]. As noted by McCarthy and Prince [1986: 52], however, in a given language vowel coalescence normally results in all short or all long vowels. But we do not find

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[17] An alternative assumption is that the /y/ of the root is simply absent, as in the perfective stem in (60), so the gerundive template is essentially CʌiC. The argument in the text regarding the distribution of [ʌy] and [e] is unchanged.

[18] Steriade and Schein [1984: 272] and Schein and Steriade [1986: 709ff] also treat Tigrinya coalescence as a purely featural process which results in a short vowel.

ħinay or *ƙʌtʌlan*, suggesting that **all** the output vowels are short in Tigrinya: not just [ʌ] but [e, o, a] and the rest.

(57) *Coalescence with possessive -ʌy*

a.	/nat-ʌy/	→	natʌy	'mine' L 52
b.	/gʌza-ʌy/	→	gʌzay	'my house' L 49
c.	/miħe-ʌy/	→	miħey	'my rug' L 51
d.	/ʌbbo-ʌy/	→	ʔabboy	'my father' L 38
e.	/ħinʌ-ʌy/	→	ħinʌy	'my vengeance' L 49

(58) *Coalescence with perfective -ʌ*

a.	/ƙʌtʌl-ʌ-nni/	→	ƙʌtʌlʌnni	'he killed me' L 155
b.	/ƙʌtʌl-ʌ-o/	→	ƙʌtʌlo	'he killed him' L 155
c.	/ƙʌtʌl-ʌ-a/	→	ƙʌtʌla	'he killed her' L 155
d.	/ƙʌtʌl-ʌ-om/	→	ƙʌtʌlom	'he killed them (m.)' L 155
e.	/ƙʌtʌl-ʌ-ʌn/	→	ƙʌtʌlʌn	'he killed them (f.)' L 155

Similar evidence comes from verbs with medial glides, called 'hollow' in traditional Semitics. For example, the perfective of a hollow verb is realized without any glide; in Arabic the expected short /a/'s on either side of the medial consonant merge to create a single long vowel [Moscati 1964: 165].

(59) *Arabic hollow verbs*

a.	qawam-a	→	qāma	'he rose'
b.	šayam-a	→	šāma	'he put'

The most straightforward analysis of such cases involves deletion of the glide, with the two short vowels combining into a single long vowel. (The glide features surface in other contexts, such as the imperatives *qum* and *šim*.) In Tigrinya, the deletion of the glide shows some optionality, or what may be dialect variation;[19] the important point is that when the glide is absent, the two stem vowels do not result in a 'long' vowel as in Arabic.

(60) *Tigrinya hollow verbs*

a.	/kʌyʌd-ʌ/	→	kʌyʌde ~ kʌde	'he went'
b.	/šʌyʌṭ-ʌ/	→	šʌyʌṭe ~ šʌṭe	'he sold'

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[19] For example, as the perfective stem of 'sell', Berhane [1991: 284] gives only *šʌṭ-*, while Leslau [1941: 119f] gives regular *šʌyʌṭ-* as an alternative. The medial glide regularly surfaces in other forms, e.g., the passive imperfective *-šiyyʌṭ-*, and the frequentative perfective *šʌyayʌṭ-* [Berhane 1991: 56, 286f]. Medial /w/ survives as rounding on the vowel, e.g., perfective *mot-* 'die' from √mwt [Leslau 1941: 116, Berhane 1991: 56].

Again, coalescence of two /ʌ/'s results not in 'long' [a] but 'short' [ʌ]: the output *kade is impossible. This fact is a particular problem for the approach of Pam [1973], where [a:] is precisely the long version of [ʌ]. However, it also casts doubt on the mixed approach in (5): either that approach predicts a long vowel as the general output of Coalescence, in which case it makes a false prediction; or the approach makes no reference to length in Coalescence, in which case there is no motivation here for including length in the first place.

5. Further vowel rules

In this section, I show that Tigrinya has three rules changing vowels in particular contexts which are easily analyzed using qualitative features alone, and which merely become more complex when length is included in the phonological representation. These rules are the fronting of central vowels word-finally (§5.1); the lowering of /ʌ/ next to a guttural consonant in the same syllable (§5.2); and morphologically conditioned dissimilation of /a/ preceding another /a/ (§5.3).

5.1. Fronting. The central vowels /ɨ, ʌ/ are fronted to [i, e], respectively, when they occur in word-final position.[20] One consequence of this alternation is found in words with underlying vowels which occur as [i] word-finally but [ɨ] when a suffix or clitic follows [Leslau 1941: 9]; underlying /ɨ/, with Fronting in final position, accounts for this pattern. Each pair in (61) includes a word-final and word-internal example to illustrate the alternation.

(61) *The alternation i~ɨwith an underlying vowel*

    a. /rʌkʌb-kɨ/   →   *rʌkʌbki*   'you (f.sg.) found' L 155

       /rʌkʌb-kɨ-nna/ →   *rʌkʌbkɨnna* 'you (f.sg.) found us' L 155

    b. /mʌk̇dɨhɨ/   →   *mʌk̇dɨhi*   'container for scooping' L 31

       /mʌk̇dɨhɨ-tat/ →   *mʌk̇dɨhɨtat* 'containers for scooping' L 31

    c. /y-k̇ʌtlʌ-nnɨ/   →   *yik̇ʌtlʌnni*   'he kills me' L 9

       /ʔay-y-k̇ʌtlʌ-nnɨ-n/ → *ʔayyik̇ʌtlʌnnɨn* 'he doesn't kill me' L 9

The same alternation is found with epenthetic [ɨ], as in (62), which appears as [i] in final position [Leslau 1941: 14]. It is not plausible to treat the epenthetic vowel as [i] which becomes [ɨ] nonfinally, since there are many examples of word-internal [i] contradicting that analysis (see (28), (41)).

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[20] More precisely, Fronting occurs when the vowel is final within a constituent which includes not only suffixes but also enclitics such as *-n* 'and' (63a). I do not pursue the question of whether this constituent should be considered a clitic group [Nespor and Vogel 1986: 145] or a phrasal correlate of the word [Inkelas 1990: 238, McCarthy and Prince 1993: 85]. Compounds must also be single constituents for the purposes of Fronting, as in *ʔamdɨrti bet* 'floors', literally 'earths (of) house' [Leslau 1941: 36].

(62) *The alternation ɨ~i with an epenthetic vowel*

    a.   /kʌlb/   →   kʌlbi̱   'dog' L 50

          /kʌlb-n/   →   kʌlbi̱n   'and (a) dog' L 14

          /kʌlb-ka/   →   kʌlbi̱ka   'your (m.sg.) dog' L 50

    b.   /mɨdr/   →   midri̱   'earth' L 31

          /mɨdr-tat/ →   midri̱tat   'earths' L 31

    c.   /ʕadd/   →   ʕaddi̱   'country' L 31

          /ʕadd-tat/ →   ʕaddi̱tat   'countries' L 31

As mentioned, a parallel pattern is found for mid vowels [Leslau 1941: 9, Denais 1990: 230], as in (63).[21] These two vowels do contrast in nonfinal position, e.g., *gʌš́* 'face' and *geš́* 'jewelry'.

(63) *The alternation e~ʌ*

    a.   /ħadʌ/   →   ħade̱   'one' L 127

          /ħadʌ-n/   →   ħadʌn   'and one' L 127

    b.   /š́aš́ʌ/   →   š́aš́e̱   'ant'

          /š́aš́ʌ-tat/ →   š́aš́ʌtat   'ants'

    c.   /dʌmbʌ/   →   dʌmbe̱   'yard, enclosure' L 9

          /dʌmbʌ-na/ →   dʌmbʌna   'our yard' L 155

    d.   /sʌbir-ʌ/   →   sʌbire̱   'I broke (something)' L 9

          /sʌbir-ʌ-kka/ →   sʌbirʌkka   'I broke you (m.sg.)' L 9

    e.   /barʌk-ʌ/   →   barʌke̱   'he blessed'

          /barʌk-ʌ-nnɨ/ →   barʌkʌnni   'he blessed me'

Assuming appropriate feature specifications [Buckley 1994], this rule can be formulated in a very simple manner: it inserts [–back] on any vowel in word-final

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[21] The native orthography of Tigrinya indicates the effect of Fronting for [i], but not (in the general case) for [e]. This difference presumably results from two inadequacies in the syllabary. First, the same character (the sixth order) is used for a simple consonant and for a consonant followed by [ɨ]; for example, ፞ም can indicate either [m] in a coda, or [mɨ] as an onset and nucleus. Second, there is no mark of gemination, the presence of which often requires a final epenthetic vowel. Consequently, if fronting to [i] were ignored in the spelling, there could be no written distinction between words such as *simmi* 'poison' (ስሚ <sɨ-mi>) and *sim* 'name' (ስም <sɨ-mɨ>). Ambiguities remain in non-final position where Fronting is inapplicable (e.g., ያምጽእ <yʌ-mɨ-š́ɨ-ʔɨ> represents both *yʌmš́ɨʔ* 'he brings' and *yʌmiš́š́ɨʔ* 'may he bring'), but marking the application of Fronting serves as a partial remedy. On the other hand, since the first-order character always expresses a vowel (e.g., መ is uniformly /mʌ/), there is no need to mark the effect of the rule. Leslau [1941], no doubt influenced by the orthography, is inconsistent in marking the Fronting pattern for mid vowels, and uses both plain <ä> (my /ʌ/) and fronted <e> on different occasions. Prætorius [1871] employs an orthography which does indicate final fronting of /ʌ/, by choosing the fifth-order character (see especially p. 25); but this is not the normal practice today.

position (64). Feature co-occurrence restrictions prevent application to the vowels /a, o, u/—which would produce ill-formed *[æ, ø, ü]. Application to /i, e/ is vacuous, correctly leaving /ɨ, ʌ/ as the only vowels that are affected.

(64) *Final Fronting*

$$V \rightarrow [-back] \ / \ \_\_ \ ]_w$$

This change is fundamentally featural, and is easily expressed as such; both the position (word-final) and the change (fronting) are well attested in rules cross-linguistically. Under an analysis where length is phonological, however, the overall process has to include lengthening: recall that the front vowels /i, e/ are both treated as long in (5), while the vowels which undergo Fronting begin as 'short' /ɨ, ʌ/. Denais [1990: 189f, 229f], for example, requires both final lengthening and introduction of a 'front' element which effects the featural change. A no-length analysis requires only a single component: insertion (by rule or other mechanism) of a front feature. Although the process can be handled by an approach with quantity, vowel length complicates the derivation and is unnecessary to our understanding of it.

5.2. Guttural lowering. By a process widely attested in Semitic [cf. Brockelmann 1908: 194, Hayward and Hayward 1989, McCarthy 1991], in Tigrinya an underlying /ʌ/ lowers to [a] by assimilation to a guttural /h, ʔ, ħ, ʕ/ in the same syllable. This assimilation can be illustrated by comparing the templatic realiza-tions of non-guttural roots, where [ʌ] surfaces (the (a) examples in (65-66)), with guttural roots in the same inflection, where that vowel is [a] (the (b-e) examples).

(65) *Guttural Lowering in the perfective template* CʌCʌC
  a. /sʌbʌr-ku/ → sʌ.bʌr.ku 'I broke' L 81
  b. /hʌrʌm-ku/ → ha.rʌm.ku 'I struck'
  c. /ʔʌsʌr-ku/ → ʔa.sʌr.ku 'I arrested' L 110
  d. /sʌħʌb-ku/ → sʌ.ħab.ku 'I pulled' L 113
  e. /bʌlʌʕ-ku/ → bʌ.laʕ.ku 'I ate' L 114

(66) *Guttural Lowering in the noun template* CʌCCʌC
  a. /kʌnfʌr/ → kʌn.fʌr 'lip' L 32
  b. /wʌhyʌw/ → wah.yo 'small skin sack' dB 633
  c. /mʌlʔʌk/ → mʌl.ʔak 'angel'
  d. /ħʌrgʌš/ → ħar.gʌš 'crocodile'
  e. /mʌʕbʌl/ → maʕ.bʌl 'wave'

These alternations are straightforwardly analyzable as spreading of the feature [+low] (or a Pharyngeal node; cf. McCarthy 1991, Selkirk 1991), as in (67). If, as I claim, [a] is a short vowel, there is no need to readjust the length of the vowel which undergoes assimilation, and it has the same features as underlying /a/.

(67)   *Guttural Lowering*

    [σ C V   (mirror image)
         | ✓
    [+low]
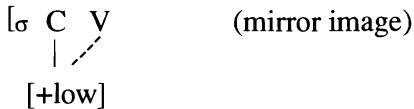
For Pam [1973: 50], short /a/ is the underlying form of the vowel that normally surfaces as [ʌ] due to his rule of Centralization; it is distinct from underlying /a:/, which does not centralize. As a result, no actual lowering rule is necessary; instead, the Centralization rule is blocked in the environment of a guttural, yielding the only examples of short [a] on the surface (68). These tokens of short [a] are not to be confused with long [a:] (e.g., [hìmba:ša:] 'bread'), which for Pam bears the feature [+long], while simple [a] is [–long].

(68)   *Centralization* [Pam 1973]: /a/ becomes [ʌ] **except** adjacent to a guttural

    a. /sabara/   →   sʌ̱.bʌ.rʌ   'he broke'
    b. /ʕaraga/   →   ʕa̱.rʌ.gʌ   'he ascended'
    c. /hanaḱa/   →   ha̱.nʌ.ḱʌ   'he strangled'

Denais [1990: 302], for whom there is no underlying short /a/, proposes an active rule which results in a short [a] in the lowering context. This is much like the rule I have given in (67), with the important difference that in my approach the output of Lowering is the same vowel as underlying /a/; while for Denais, underlying /a/ is actually a long vowel, and the [a] derived from Lowering is short. Thus, like Pam, he ends with a representational contrast between surface [a] and [a:]. Since these two vowels are represented as distinct in phonological length, we should expect a difference in pronunciation. However, this prediction is not borne out by any source I have consulted. My own perception is that [a] which results from lowering of /ʌ/ is identical to underlying /a/. Leslau [1941: 110] confirms this in describing the lowering that occurs in verbs with an initial guttural in the root (as in (65b,c)): "La première radicale, étant une laryngale, est prononcée avec la voyelle *a* [...] de sorte qu'au point de vue de la prononciation il n'y a aucune différence entre les types A et C." Type A verbs are the normal triliterals, while Type C verbs have underlying /a/ after the first consonant; this pattern is discussed in the next section. The point to be emphasized here is that inclusion of length in the phonology leads to a dubious prediction for Guttural Lowering, which is a simple process under a purely featural analysis.

It should also be noted that Guttural Lowering applies unimpeded in the syllable before the *-t* suffix (§3.3). This indicates that there is no absolute prohibition on the 'long' vowel [a] appearing in that syllable. The templates here are $C_{\Lambda}C(C)_{\Lambda}C$.

(69) *Guttual Lowering before* -t
  a. *bʌllaħ*   'sharp, smart (f.sg.)'
      bʌllaħ-ti   'sharp, smart (pl.)' L 35
  b. *sʌħaf-i*   'scribe (m.)' L 35
      sʌħaf-ti   'scribes' L 35
  c. *rʌdaʔ-i*   'helper (m.)' L 35
      rʌdaʔ-ti   'helpers' L 35

These facts hold despite the supposed closed-syllable shortening with non-guttural roots in (36) and (37). However, if 'shortening' is merely the choice of the template, e.g., agentive $C_{\Lambda}C_{\Lambda}C$-t (47), there is no reason to expect a failure of Lowering when the consonants in the template trigger that rule: the underlying /ʌ/ is the same as any other. The words in (69) are exactly what the templatic analysis predicts, but create a potential problem for the closed-syllable shortening approach.

5.3. Low dissimilation. As mentioned above, Tigrinya has a set of verb roots, traditionally termed Type C, which are characterized by the occurrence of the vowel /a/ between the first and second root consonants in the finite forms, and /ɨ/ in this position in the infinitive [Leslau 1941: 95, 1961].

(70) *Type C verb stems*
      perfective C_1 a C_2 ʌ C_3
      gerundive C_1 a C_2 i C_3
      imperfective C_1 a C_2 ɨ C_3
      infinitive C_1 ɨ C_2 a C_3

By contrast, in the Type A forms the first vowel is /ʌ/ in the finite forms, and there is no corresponding vowel in the infinitive. This fact is illustrated in (71) using the Type A verb √grf 'whip', alongside Type C √brk 'bless' [Berhane 1991: 176f].

(71) *Comparison of Type A and Type C verbs*

		Type A	Type C
a.	perfective	*gʌrʌf-e*	*barʌk-e*
	gerundive	*gʌrif-e*	*barik-e*
	imperfective	*yɨ-gʌrrif*	*yɨ-barɨk*
b.	infinitive	*mɨ-graf*	*mɨ-bɨrak*

A particularly notable fact about Type C is the unusual presence of the vowel [ɨ] in the infinitive stem where it is not required by syllable structure: that is, one normally finds [ɨ] in a stem only when it can be construed as the result of Epenthesis (cf. Denais 1990: 93ff; see Hayward [1986] for a similar point in Amharic). I believe that it is no coincidence that this vowel occurs in the same position where [a] is found in the finite stems—namely, between the first and second root consonants—and that the [ɨ] is derived from the /a/ which characterizes that position.

Before we turn to the analysis, note a similar alternation between [a] and [ɨ] in the frequentative forms of the verb: here we find [a] before the last syllable of the finite stem, and [ɨ] in the same position in the infinitive. Since this vowel entails an additional syllable, spreading of the second root consonant is in most cases necessary to provide an onset for the penultimate syllable. This pattern holds for all four basic verb types in the language: those given in (71) plus Type B √bdl 'offend' and quadriliteral √mskr 'witness' [Berhane 1991: 179f, 342f].

(72) *Frequentative verbs*

		Type A	Type B	Type C	Quadriliteral
a.	perfective	*gʌrarʌf-e*	*bʌdadʌl-e*	*bararʌk-e*	*mʌsʌkakʌr-e*
	gerundive	*gʌrarif-e*	*bʌdadil-e*	*bararik-e*	*mʌsʌkakir-e*
	imperfective	*yi-gʌrarif*	*yi-bʌdadil*	*yi-bararik*	*yi-mʌsʌkakir*
b.	infinitive	*mi-giriraf*	*mi-bididal*	*mi-birirak*	*mi-misikikar*

Once again we find [ɨ] in the same position as the finite [a], between the reduplicated consonants. There is the additional complication that every frequentative infinitive has [ɨ] in at least two syllables, not just the penultimate but also the antepenultimate. The issue is not directly relevant to the main interest here, but this vowel could similarly be analyzed as underlying /a/, with left-to-right application of the dissimilation rule in (73). This is the likely explanation at least for Type C, where both /a/'s are independently motivated by the finite forms.[22]

Buckley [1994] proposes that both Type C and the frequentative are derived by infixation of /a/ before the final syllable of the stem; as mentioned, the frequentative also involves spreading of a root consonant.[23] In most cases, this /a/ surfaces intact as a low vowel, but in the infinitive, when the stem-final syllable contains

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[22] For example, analogy may operate between the two identical root consonants: the vowel before the rightmost [r] (*migiriraf*) could induce an identical vowel before the preceding [r] (*migiriraf*). See also Leslau [1941: 97] for slightly different forms (with gemination of the first root consonant in the infinitive, e.g., *missibibar* 'to smash') which make this extra [ɨ] appear epenthetic, at least in the triliteral verbs.

[23] Similar insertion of /a/ is exploited by Angoujard and Denais [1989: 135] to derive broken plurals of the type shown in (20). Berhane [1991: 76] derives the [a] in Type C from normal /ʌ/ which lengthens; since [ʌ:] is ill-formed, a featural change is invoked to produce [a:].
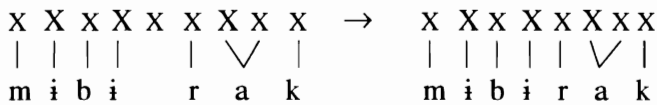
/a/, a rule of dissimilation applies (73).[24] With the feature underspecification given by Buckley [1994], deletion of [+low] on the first vowel results in a fully unspecified vowel, which by default surfaces as [ɨ]. The two /a/'s are separately linked since they come from different morphemes: the first is infixed as the exponent of Type C or the frequentative, while the second belongs to the infinitive template. This rule is similar to others proposed for Kera [Archangeli and Pulleyblank 1989; cf. Ebert 1979: 20], Rwaili Arabic [Parkinson 1993], and Woleaian [Suzuki 1996].

(73) *Low Dissimilation*

$$
\begin{array}{ccc}
\text{V} & \text{C} & \text{V} \\
\not| & & | \\
\text{[+low]} & & \text{[+low]}
\end{array}
$$
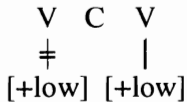
In the purely featural analysis proposed here, loss of the [+low] feature is all that must occur. In the mixed inventory of (5), however, not only must /a/ become a high vowel but it must lose half its length also. For example, Denais [1990: 106f] assumes that Type C verbs have a template which contains a long vowel in the first syllable, normally [a:]. Though he does not account for the absence of [a:] in the infinitive, he attributes the [ɨ] which surfaces there to the default filling of an empty vocalic slot between the first two root consonants. Since this default vowel is short, the extra vowel slot is deleted (74). In my approach, the slot (i.e., the mora) dominating [ɨ] is a projection of /a/, which in the infinitive does not retain its [+low] feature due to Dissimilation; no special templatic statement is required. This also explains why [ɨ] occurs in a position where it is not necessary for syllabification.

(74) *Loss of a timing slot* [Denais 1990]

$$
\begin{array}{ccccccccc}
\text{X} & \text{X} & \text{X} & \text{X} & \text{X} & \text{X} & \text{X} & \text{X} & \rightarrow \\
| & | & | & | & & | & \vee & | & \\
\text{m} & \text{ɨ} & \text{b} & \text{ɨ} & & \text{r} & \text{a} & \text{k} &
\end{array}
\qquad
\begin{array}{cccccccc}
\text{X} & \text{X} & \text{X} & \text{X} & \text{X} & \text{X} & \text{X} & \text{X} \\
| & | & | & | & | & | & \vee & | \\
\text{m} & \text{ɨ} & \text{b} & \text{ɨ} & \text{r} & & \text{a} & \text{k}
\end{array}
$$

As with Fronting (§5.1) and Guttural Lowering (§5.2), the inclusion of vowel length in the phonology serves only to complicate the analysis of these funda-

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[24] Examples such as *bararʌke* in (72) show that Dissimilation does not occur in finite forms. One account of this fact is to stipulate that the rule is restricted to nonfinite verbs. A more interesting possibility is that the infixed /a/'s which mark Type C and the frequentative are a single vowel autosegment, multiply linked to two syllables in words where both occur. If this is the case, the single [+low] feature does not satisfy the conditions for Dissimilation. This assumption is fully compatible with the fact that both these /a/'s become [ɨ] in the infinitive (72b); the single multiply linked autosegment necessarily undergoes Dissimilation as a unit when infinitival /a/ follows.

mentally featural processes. Together these diverse rules provide additional strong evidence in favor of omitting length from the phonology of Tigrinya.

6. Conclusion

I have presented a range of evidence to support the view that vowel length plays no role in the phonology of Tigrinya. Cases of apparent closed-syllable shortening which have been adduced in favor of phonological length were shown to be extremely limited in their context, and more accurately analyzed as templatic vocalism. The predictions of phonological vowel length are contradicted by the restriction on minimal word size and the distribution of vowels in closed syllables. Vowel length also creates complications for the analysis of vowel coalescence, fronting of central vowels in word-final position, lowering of /ʌ/ adjacent to a guttural consonant, and dissimilation of /a/ in the infinitive. All of these processes receive a straightforward analysis in a purely qualitative approach, with no role for vowel length in Tigrinya phonology.

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PUBLICATIONS RECEIVED

Gottlieb, Alma and M. Lynne Murphy. *Beng-English Dictionary with English-Beng Index*. Bloomington, IN: Indiana University Linguistics Club. 1995. Pp. xxv, 116.

This dictionary derives from the first author's fieldwork with the Beng in central Ivory Coast for fourteen months in 1979-80 and two months in 1985. An introductory section provides an overview of the Beng language, part of the Southern Mande family, its dialects, multilingualism, naming practices, and previous work on the language. In a separate section, the second author provides a brief description of the structure of Beng, including notes on phonetics, phonology, gender, and sentence structure. The Beng-English Dictionary, which includes a brief introduction on how to use the dictionary, is followed by an English-Beng Index and an Index to Beng ailments and their remedies.

Neukom, Lukas. *Description grammaticale du nateni (Bénin): Système verbal, classification nominale, phrases complexes, textes*. Universität Zürich. 1995. Pp. vii, 250.

Nateni is a Voltaic language spoken in the north of Benin. This descriptive and analytical study, based on the descriptive model developed by Emilio Bonvini (1988) of the CNRS, is the author's "mémoire de licence" presented in 1994 at the Université de Zurich. It comprises five chapters plus appendices and index. The introductory chapter presents a brief overview of the classification of the language, its basic phonology and syntax. Chapter II, the major section of the book, focuses on the verb. The author describes structural features of verb roots and derivational forms, temporal forms (both aspect and tense), and auxiliary verbs. The third chapter describes the structure of the noun, while the fifth describes various syntactic forms: focus, thematicization, coordination ,and subordination among others. The appendices comprise eleven texts with interlinear gloss.

Bartens, Angela. *Der kreolische Raum. Geschichte und Gegenwart*. Annales Academiae Scientiarum Fennicae B 281. Helsinki: Suomalainen Tiedeakatemia [Die Finnische Akademie der Wissenschaften] 1996. Pp. 245. FIM 140.

This is a monograph which could serve very well as an introduction to pidgin and creole linguistics in university courses or simply as a readable source book for persons wishing to inform themselves about this fascinating area at the nexus of linguistics, history, anthropology, and sociology. Its five chapters cover the historical development of pidgin and creole languages linked with the European colonial expansion of the last 500 years, basic principles of the science of creolistics, the genesis of creole languages and the resulting creole grammar, creole culture in the wider sense, and the present state of creole languages world-wide. The 186 pages of text are

followed by a valuable and wide-ranging 50-page reference list. The small index is better than nothing, although it does little justice to the highly interesting and readable text.

The big drawback to Bartens' work is that it did not appear in English, or at least in French. Presumably, only university students in German-speaking countries or the few students elsewhere sufficiently familiar with German could use the book with profit. Even though Bartens cites many English-language sources, there is noticeable tendency to use Romance or German language sources when satisfactory books and articles in those languages are available. The great majority of her examples are drawn from Romance-based creoles. This quality makes the book a healthy antidote to English or French works which focus largely on their respective creoles. But then again, relatively few Portuguese, Spanish, or even French scholars will know enough German to be able to use the book with profit.

The book can also be regarded as a contribution to the Ausbau of creolistics in Germany, or, in this case, the German language area of Europe (extending as far as Finland). Many terms from English and French creolistics are rendered by means of loan renditions, loan translations (calques), or are simply borrowed into German, sometimes with respellings. Bartens has contributed in no small measure to the creation of an "einheimische Kreolistik im deutschen Sprachraum", independent of the English and French traditions, and harkening back to the early 20th century and the genial scholarship of Hugo Schuchardt. [Glenn Gilbert, Southern Illinois University, Carbondale]

UPCOMING MEETINGS
ON AFRICAN LANGUAGES/LINGUISTICS

1997

JULY 7-11

INTERNATIONAL BIENNIAL CONFERENCE OF THE AFRICAN LANGUAGE ASSOCIATION OF SOUTHERN AFRICA (ALASA 97), 9TH. The University of Natal, Durban, South Africa. (Contact: Prof. N Canonici, Department of Zulu Language and Literature, University of Natal, Durban, P.O. Box 18091, Dalbridge, 4014, South Africa. Tel. 27-31-260-2510; fax: 27-31-260-3362; e-mail: canonici@mtb.und.ac.za)

July 11-13

ANNUAL CONFERENCE ON AFRICAN LINGUISTICS (ACAL), 28TH. Cornell University, Ithaca, NY (in conjunction with the LSA Linguistics Institute) (Contact: ACAL 28, Department of Linguistics, 227 Morrill Hall, Cornell University, Ithaca, NY 14853. Fax: 607-255-2044)

July 27 - August 3

WORLD CONGRESS OF AFRICAN LINGUISTICS, 2ND. University of Leipzig, Germany. (Contact: World Congress of African Linguistics, Institut für Afrikanistik, Universität Leipzig, Augustusplatz 9, D-04109 Leipzig, Germany. Tel. 49-341-97-37031; fax: 49-341-97-37048; e-mail: wocal97@uz.uni-leipzig.de)

August 28-30

COLLUQUIUM ON AFRICAN LANGUAGES AND LINGUISTICS, 27TH. Leiden, The Netherlands. (Contact: Thilo C. Schadeberg, CALL 27, Afrikanse Taalkunde, Rijksuniversiteit to Leiden, P.O. Box 9515, 2300 RA Leiden, The Netherlands. Tel: 00-31-71-527-2245; Fax: 00-31-71-527-2615; e-mail: schaberg@rulcri.LeidenUniv.nl.)

September 17-20

LANGUAGES OF THE FAR EAST, SOUTHEAST ASIA, AND WEST AFRICA. Moscow, Russia. (Contact: Mark I. Kaplun, Exec. Sec., 11 Mohovaya ul., Institute for Asian & African Studies, 103009 Moscow, Russia; Tel: 7-095-203-2725; Fax: 7-095-203-3647; e-mail: kasevich@vbk.usr.pu.ru)

December 12-17
INTERNATIONAL CONFERENCE OF ETHIOPIAN STUDIES, XIIITH. Hotel Sunflower
Kyoto, Kyoto, Japan. (Contact: ICES Project Office, c/o Katsuyoshi Fukui,
Faculty of Integrated Human Studies, Kyoto University, Sakyo, Kyoto 606-
01, Japan. Fax: +81-75-753-6615; e-mail: ethiopia@jambo.africa.kyoto-
u.ac.jp)

1998

Spring
NORTH AMERICAN CONFERENCE ON AFROASIATIC LINGUISTICS, 26TH. New
Orleans, Louisiana   (American Oriental Society) (Contact M. Lionel
Bender, Department of Foreign Languages, Southern Illinois University,
Carbondale, IL 62901; e-mail: NACAL26@siu.edu)

March
ANNUAL CONFERENCE ON AFRICAN LINGUISTICS (ACAL), 29TH. Yale
University, New Haven, Connecticut.

March 29 - April 2
ASSOCIATION INTERNATIONALE DE DIALECTOLOGIE ARABE, 3RD (AIDA). Malta
(Contact: Manual Mifsud, Old Humanities Building, Room 353, University
of Malta, Msida MSD 06, Malta. Fax: 356-345-655; e-mail: mmfisud@
waldonet.net.mt)

September 2-6
INTERNATIONAL CONFERENCE ON NILO-SAHARAN LINGUISTICS, 7TH.
Department of African Studies, Institut für Afrikanistik, Vienna, Austria.
(Contact 7th Nilo-Saharan Linguistics Conference, Institut für Afrikanistik,
Universität Wien, Doblhoffgasse 5/9, A-1010 Vienna, Austria. Tel: +43-1-
4052273; Fax: +43-1-405227319; e-mail: norbert.cyffer@univie.ac.at)

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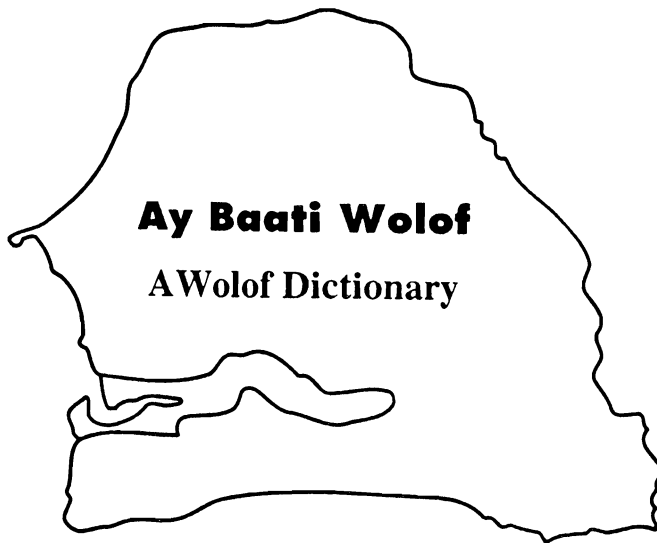Book rate postage (surface): $2.00 for each book or cassette set ordered   _____

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