DOCUMENT RESUME

ED 107 110 FL 006 296

AUTHOR	Bell, Alan
TITLE	Development of Syllabic Nasals: The Case of the Bantu Noun Class Prefixes "Mu-, "Mi-," "Ma-." Working Papers on Language Universals, No. 2.
INSTITUTION	Stanford Univ., Calif. Committee on Linguistics.
PUB DATE	Jan 70
NOTE	21p.
AVAILABLE FROM	Anthropological Linguistics, Anthropolo'y Department, Rawles Hall 108, Indiana University, Bloomington, Indiana 47401 ($0.55)
JOURNAL CIT	Anthropological Linguistics; v14 n2 p29-95 1972
EDRS PRICE	MF-$0.76 HC Not Available from EDRS. PLUS POSTAGE
DESCRIPTORS	African Languages; *Bantu Languages; Contrastive Linguistics; Descriptive Linguistics; Diachronic Linguistics; *Distinctive Features; Form Classes (Languages); Language Patterns; Language Research; Language Universals; *Nominals; *Phonological Units; Structural Analysis; *Syllables; Vowels

ABSTRACT

The reflexes of the proto-Bantu noun class prefixes of the form "mu-," "mi-," and "ma-" are compared in 84 Bantu languages. The hypotheses that syllabic nasals arise preferably from sequences of m + rounded high vowel, rather than m + unrounded high vowel, are tested against the data. The approach is an example of intragenetic comparison discussed by Greenberg (1969). The results confirm the hypotheses. Some details on the stages of development of syllabic nasals are discussed, and a formal representation of the intermediate states and processes is sketched. (Author)

DEVELOPMENT OF SYLLABIC NASALS:

THE CASE OF THE BANTU NOUN CLASS PREFIXES MU-, MI-, MA-

Alan Bell

ABSTRACT

The reflexes of the proto-Bantu noun class prefixes of the form *mu-, *mi-, and *ma- are compared in 84 Bantu languages. The hypotheses that syllabic nasals arise preferably from sequences of m + high vowel, rather than m + nonhigh vowel, and from sequences of m + rounded high vowel, rather than m + unrounded high vowel, are tested against the data. The approach is an example of intragenetic comparison discussed by Greenberg (1969). The results confirm the hypotheses. Some details on the stages of development of syllabic nasals are discussed, and a formal representation of the intermediate states and processes is sketched.

1. <u>The origin of syllabic nasals</u>. Syllabic nasals, like other syllabic consonants, have an almost exclusive origin in the sequences of nasal and vowel (or vowel and nasal) in which the vowel is lost. Elsewhere (Bell 1969) I have suggested, on the basis of comparison of syllabic nasals in some 60 languages, that in this process there is a preference for syllabic nasals to be formed from sequences of <u>m</u> or ŋ preceded or followed by high, back, rounded vowels.[1] The general nature of this preference is well founded, but the details require more substantiation. In this paper we attempt to test a subpart of the hypothesis which is concerned only with the development of syllabic nasals from sequences of <u>m</u> + vowel. Specifically, we wish to test the two hypotheses that whenever syllabic nasals are formed from loss of a nonhigh vowel they will also be formed from high vowels,[2] and whenever they are formed from loss of nonround high vowels they are also formed from high round vowels:[3]

(1a) $$\text{If } \underset{|}{m},\ \underset{|}{N} < m\begin{bmatrix}-\text{high}\\ V\end{bmatrix} \text{ then } \underset{|}{m},\ \underset{|}{N} < m\begin{bmatrix}+\text{high}\\ V\end{bmatrix} \text{ and}$$

(1b) $$\text{if } \underset{|}{m},\ \underset{|}{N} < m\begin{bmatrix}+\text{high}\\ V\end{bmatrix} \text{ then } \underset{|}{m},\ \underset{|}{N} < m\begin{bmatrix}+\text{round}\\ +\text{high}\\ V\end{bmatrix},$$

where N stands for a nasal homorganic to the following consonant.

---

[1] It appears necessary to distinguish at least two types of vowel loss. One type is characterized by preference for loss of central, reduced vowels. In the other type, vowels characteristically tend to be lost first. The hypotheses in this paper about the development of syllabic nasals are not proposed to apply to the reduced-vowel type of syncope.

[2] In view of the self-imposed restriction of Note 1, this hypothesis might be considered tautological. This is not the case. The hypothesis can be disconfirmed, but only if the vowel of the <u>implicans</u> is not a reduced, central vowel.

[3] From the Bantu data we cannot distinguish whether rounding or backness is the factor influencing syncope. Rounding has been chosen on grounds of phonetic plausibility.

2. Intragenetic comparison. The method we use is that of 'intragenetic comparison,' a term introduced by Greenberg (1969), where the method is discussed in detail. In this method a processual hypothesis is proposed, stated in such a way that it is clear what evidence will refute it. It is worth noting that usually no claim is made that a given change will take place. Rather, it is asserted that one of two or more changes will not occur, or else, as here, that if a given change occurs, then necessarily some other must have occurred. Comparison is limited to a group of related languages, in our case the Bantu languages. The comparison is dynamic, since although the actual data compared may be synchronic states, they are cognate items with a presumed common origin, and thus have a processual interpretation that is built in.

The reader may wonder why we propose a hypothesis about language in general and test it with data from a single family. Comparison of processes across unrelated languages ('intergenetic comparison') would offer assurance that the phenomena in question are significant for language in general and not the product of some factor specific to a language family. An example is the remarkable parallel demonstrated by Greenberg for the laryngeal processes in Indoeuropean and Egyptian. For a specific hypothesis such as ours, however, it is difficult to find more than a handful of comparable cases for which there is reliable diachronic data. Within a single family we have the opportunity of comparing a number of processes for which the initial states are identical, or nearly so. In the specific case of the development of syllabic nasals, the general hypothesis was formed on the basis of data from unrelated languages, but the situations were enough different that the details could not be surely determined. It is thus appropriate to verify the details by using intragenetic comparison to test the corresponding specific hypotheses.

3. Bantu prefixes as a test of the hypotheses. Bantu languages possess a complex system of noun classes, marked by prefixes. Three of these prefixes have been reconstructed in proto-Bantu as *mu-, *mi-, and *ma- (Meinhof 1948). They have retained this form in many Bantu languages, e.g. LUGANDA and KIKUYU. In many other languages, the prefix vowel has been lost, leaving a syllabic or nonsyllabic nasal. The development of the class prefixes in Bantu provides an empirical test of our hypotheses that is nearly ideal, for it has two essential qualities expected of empirical tests. First, it is well controlled. The development of the prefixes is recent enough that we have considerable confidence that the reconstructed forms were indeed *mu-, *mi-, and *ma-, so that our original forms are phonologically identical except for vowel quality. Equally important, the contexts in which they occur, with respect to constituent structure, prosodic systems, and segmental structure, are as nearly identical as could be expected. Second, it is powerful because a priori there is much opportunity for the hypotheses to be rejected. This is because we can observe so many Bantu languages that reflect the diachronic processes which have operated on the initial state. There are over 200 Bantu languages and a large number of these have been sufficiently well described for our purposes. Our sample, by no means exhaustive, includes 84 languages or dialects. More important than the size of the language sample is the number of independent processes that the sample represents. Surely some of the languages in our sample do

represent processes which are related genetically or areally.[4] Nevertheless, the evidence indicates that the sample reflects many instances of parallel yet independent change. If we examine the areal distribution of the sampled languages shown on the map of Figure 1, we find both vowel loss and vowel retention throughout Bantu-speaking Africa, from Cameroon in the northwest (DUALA vs. LUNDU), to Kenya in the northeast (SWAHILI vs. KIKUYU), to South Africa in the south (XHOSA vs. PHUTHI). Furthermore, within closely related subgroups are found languages that have lost some of the m-prefix vowels and languages that have not. For example, within the Sotho-Tswana group, SOTHO, TSWANA, KGALAGADI, and PED' have lost vowels in some instances; LOZI, PULANA, and KUTSWE have not. The Nguni, Basa, Kongo, and Taita groups are also of this mixed nature.

4. The language sample. The forms of the m-prefixes of 84 Bantu languages were obtained. A few languages had been previously eliminated from the sample because the noun classes in question were missing or highly deviant from the usual Bantu classes. The languages represent 52 of the 83 groups listed by Bryan (1959). A full list with sources is given in Section 10.

5. Noun-classes and the prefixes mu-, mi-, and ma-. Bantu noun classes are traditionally referred to by number (Meinhof 1948). We are mainly concerned with classes 1, 3, 4, and 6; class 18 plays a lesser role. In this usage, singular and plural forms of a given noun belong to different classes. As in most gender systems, the classes usually have some strong correlation with one or more semantic features. Nouns in a given class take the noun prefix of the class, and participate in complex systems of agreement in which associated adjectives, verbs, etc. are marked by other prefixes (often differing from the noun prefix).

Class 1 (prefix *mu-) contains singular nouns denoting human beings. Class 3 (prefix *mu-) and class 4 (prefix *mi-) are the singular and plural respectively of nouns denoting a variety of things, including some animals, trees and plants, diseases, locative terms, etc. Class 6 (prefix *ma-) has a number of functions. As an independent class it contains collectives, mass nouns, and abstract nouns, among others. It serves as the plural of class 5, which contains mainly miscellaneous nouns and the names of most fruits. Class 6 is also used as the plural of two or three other classes. Class 18 (prefix *mu-) is one of three original locative classes. While classes 1, 3, and 18 have the same original prefix *mu-, they are usually distinguished both by their semantic content and by the different series of prefixes used in agreement with them. As we shall see, these three noun prefixes sometimes undergo different phonological developments.

---

[4] For example, the following cases of closely related languages with similar m-prefix forms are found in the sample: KALANGA and LILIMA, KUTSWE and PULANA, FANG and YAUNDE, LINGALA and BOBANGI, ZIGULA and NGULU, SWAZI and ZULU, TSWANA and PEDI, GANDA and RUNDI, and SUBIYA and TONGA. However, we have generally restrained ourselves from inflating the sample in this way. Particularly in the surveys of Guthrie (1953), Richardson (1957), and Tucker and Bryan (1957), noun class prefixes are frequently said to be the same for several members of a group, and we could reasonably have listed each language. Usually the best known or best described language was sampled instead.

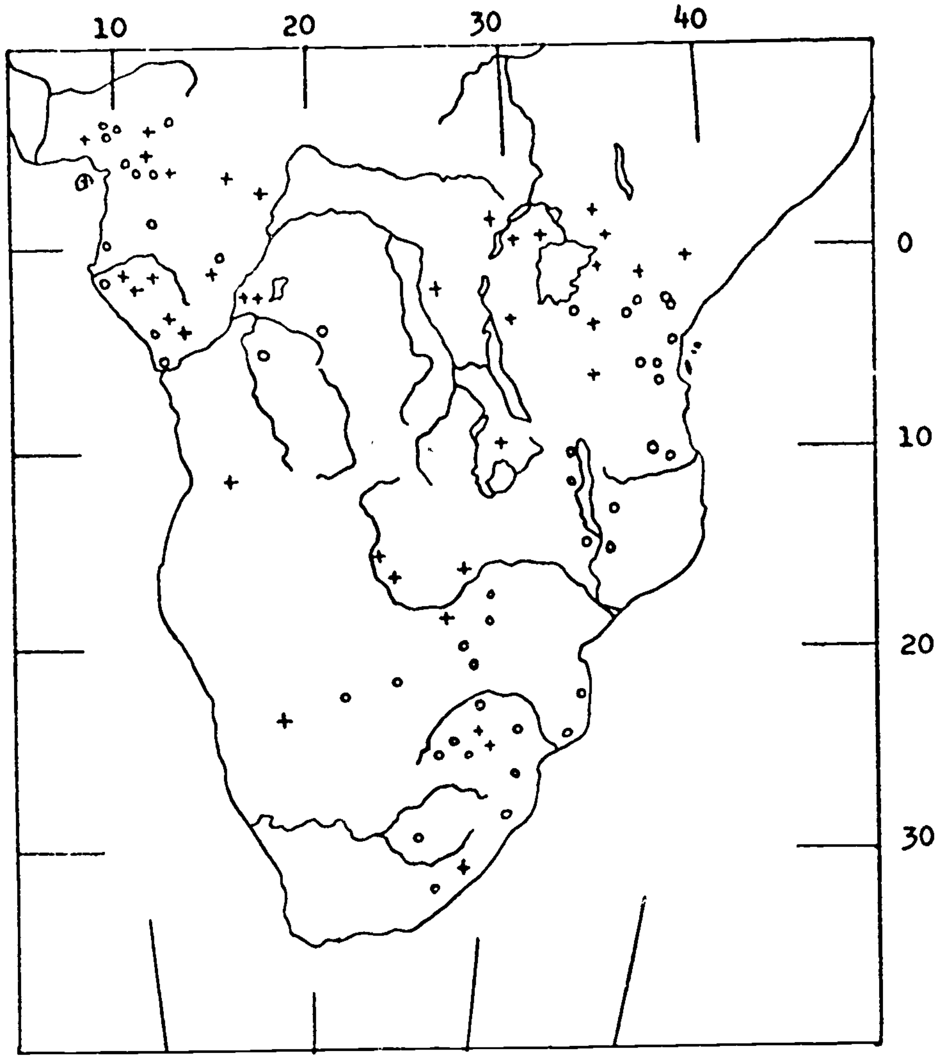

Figure 1. Distribution of syncope of mu- and mi- noun class prefixes in sampled Bantu languages.

Key: o = prefixes syncopated + = prefixes not syncopated

Location of languages based on the map of Bryan (1959)

Two other prefixes deserve mention, although they are not treated further. Class 9 (prefix *ni-) contains many animal names and is sometimes called the animal class. In virtually all Bantu languages the vowel has disappeared, the nasal has become homorganic, and frequently the following consonant has been modified in manner, with or without loss of the nasal. It may be conjectured that development of this prefix has often influenced the course of the m-prefixes. This may be so; yet the usual pattern is one of great difference between the reflexes of *ni- and the m-prefixes. In SWAHILI, for example, the class 9 nasal, where retained, is homorganic, but the class 1 nasal is always bilabial; the class 9 nasal is syllabic only in stressed position before monosyllabic stems, but the class 1 nasal is syllabic before stems of all lengths.

The other prefix is the pronominal object prefix of the third person singular (*mu-). It occurs before verb roots, usually word-medially, preceded by other prefixes. We have not treated it with the noun-class prefixes because of its different context.

6. Analysis of the data. The reflexes of the m-prefixes were categorized in the following manner. Only word-initial preconsonantal environments were considered, since this is the environment expected to be most favorable to development of syllabic consonants, on the basis of empirical data from unrelated languages. In this environment, a prefix was classed as syncopated if it consisted of a nasal alone, syllabic or not, in any given subenvironment (say, only before labial consonants). It happened that no instances of syncopated ma- prefixes were found, so that hypothesis (1a) was vacuously confirmed. In what follows we refer only to the mu- and mi- prefixes. The syncopated forms were further categorized according to syllabicity and homorganicity. A prefix was classified as syllabic if it occurred as a syllabic nasal in any subenvironment. Most descriptions indicated whether the nasal was syllabic, at least in some environments. A transcription of an initial geminate nasal, e.g. BUSHONG mmɔ́ny 'celui qui voit' (Vansina 1959) is taken to indicate a syllabic nasal. Where the syllabicity could not be inferred from the description, the prefix was classed as syllabicity unknown.

Prefixes were classed as nonhomorganic if in all preconsonantal environments the syncopated nasal was labial. Thus, an m-prefix syncopated only before labial consonants is called nonhomorganic according to this rule.

7. Results. In 38 languages neither mu- nor mi- prefixes were syncopated:[5] BEMBA, BEMBE, BENGA, BOBANGI, GANDA, GISU, GOGO, GUSII, HERERO, KIKUYU, KIMBUNDU, KONZO, KUTSWE, LEGA, LINGALA, LOZI, LUHYA, LUNDU, LUYI, MAKAA, MBETE, NGANDO, NGONDI, NILYAMBA, NYOKON, NZEBI, PHUTHI, POKOMO, PULANA, PUNU, RUNDI, SUBIYA, TEGE, TIINI,

[5] This should be taken as a maximum figure. Syncopated m-prefix forms may well occur in restricted environments in some of these languages, since some descriptions apparently give only the 'normal' form, or else are based on data from very few nouns. For example, Guthrie (1953) describes the m-prefixes of DUALA as nonsyncopated, and so would we have classed them, had we not had the more detailed information of Ittman (1939).

TONGA (Ila group), TSOGO, VANUMA, YAMBASA. In four of these, MBETE, NYOKON, TEGE, and YAMBASA, the prefixes consist of a vowel only, lacking an initial m-. In 46 languages,[6] either a mu- prefix or a mi- prefix, or both, have syncopated forms. These languages, and their classification with respect to syllabicity and homorganicity, are presented in Figure 2. The entries with subscripts, e.g. $Duala_1$ and $Duala_3$, refer to languages in which the class 1 prefix mu- and the class 3 prefix mu- have developed differently. They are discussed separately in Section 9.1.1, along with the cases where the Class 18 prefixes have developed differently.

One language, BEMBE, a member of the Kongo group, has developed a syllabic nasal before some vowel-initial stems: mu + V > ŋ̍w ~ ŋgw. Except that the syllabicity of the nasal is unknown, the process has also occurred in SHAMBAA; it resembles the 'velarization' characteristic of the SHONA group (Doke 1931).

8.1 Confirmation of the hypotheses. Hypotheses (1a) and (1b) are confirmed by the data. Figure 3 summarizes the classification of the languages according to syncopation of the mu- and mi- prefixes. Hypothesis (1b) would have been rejected if a language had exhibited a syncopated mi- prefix but had no instance of a syncopated mu- prefix. Hypothesis (1a) was confirmed by default, there being no case of syncope in a ma- prefix.

MU- PREFIXES	MI- PREFIX - syncopated	MI- PREFIX + syncopated
- syncopated	38	0
+ syncopated	37	9

Figure 3. Summary of Bantu languages according to syncopation of mu- and mi- prefixes

8.2 Alternative hypotheses and explanations of the data. Though the data confirm our hypotheses, some questions may be raised concerning rival explanations of the data and alternative formulations of the hypotheses.

8.2.1 Why the restriction to syllabic nasal? The reader may have noticed that the data also support the hypothesized hierarchy of vowel features in the case of syncopation leading to a nonsyllabic labial nasal. We have preferred, nevertheless, to draw no inferences about this case, limiting ourselves to conclusions about the rise of syllabic [m̩]. After all, a nonsyllabic syncopated form was definitely attested for only four languages, a rather sparse data base even for conjecture. And had there been more, a more fundamental objection exists to testing the hierarchical hypothesis for nonsyllabic [m] against data of this sort:

[6] KELE's mu- prefix, which phonetically is a nasal labio-dental sonorant [ṽ] (almost closed), is categorized as syncopated. Six languages with class 4 prefixes of the form miN- were also categorized as syncopated. This means that the number of languages with syncopated mi- prefixes may be overstated (see Sec. 8.2.2).

MU-prefix			MI-prefix: nonsyncopated	MI-prefix: syncopated, nonhomorganic -syl	syncopated, nonhomorganic +syl	syncopated, nonhomorganic ?syl	syncopated, homorganic -syl	syncopated, homorganic +syl	syncopated, homorganic ?syl
nonsyncopated			38 languages - see text			Duala$_1$			
syncopated	nonhomorganic	-syl	Chopi$_1$						
		+syl	Akwa$_3$, Chopi$_3$, Kele, Kgalagadi, Nrebele, Ngoni, Ngulu, Nyanja, Sotho, Swahili, Swazi, Tswana, Venda, Xhosa, Yao, Zezuru, Zigula, Zulu						
		?syl	Dabiba$_1$, Pedi, Teri, Tumbuku			Duala$_3$, Moshi, Mpongwe			
	homorganic	-syl	Tonga, Tsonga				Kaa$_3$		
		+syl	Bafaw, Bushong, Kalanga, Lilima, Maconde, Mashami, Mbo, Mwera, Ngayaba, Vili				Kaa$_1$	Kongo	Fang, Mbene, Yaunde, Yombe
		?syl	Konde, Shambaa, Sukuma						

Figure 2. Classification of Bantu languages according to syncopation, syllabicity, and homorganicity of *mu-* and *mi-* noun prefixes

The hypothesis about syllabic nasals is more easily falsified than the corresponding one about nonsyllabic nasals. While it is evident that syllabic nasals can become nonsyllabic (and thus some of the attested nonsyllabic syncopated prefix forms may represent earlier syllabic forms), the opposite process appears to be highly disfavored. Now consider a language that has no syncopated mu- prefixes but does contain syncopated mi- prefixes. If they are nonsyllabic they may well represent an original compound process mi > m̩ > m instead of the process mi > m. Thus the nonsyllabic hypothesis cannot be falsified by such data unless the possibility of the compound hypothesis can be ruled out. On the other hand, if the syncopated mi- prefixes are syllabic, they very probably attest to the process mi m̩ Such a case reveals nothing about the nonsyllabic hypothesis, but falsifies the hypothesis stated in terms of syllabic m̩ .

8.2.2 Markedness of the plural prefix The objection may be raised that the observed failure of syncopation to initiate in the mi- prefix is to be explained by the markedness of this plural prefix, since marked forms tend to have an overt marker (Greenberg 1966). I do not believe this. Still, paradigmatic markedness is certainly confounded with vowel quality in our 'experiment', and cannot simply be dismissed. Nicely as she has designed the experiment, Nature has let us down by not providing us with all singular prefixes or, even better, a set of reversed prefixes, singular mi-/plural mu-. If we cannot rule it out entirely, we can at least point to certain factors which suggest that syntactic function is of less importance here than the difference in phonetic form. Note that in some cases the plural has indeed lost its distinctive vowel and merged in form with the singular. The markedness of the plural may inhibit somewhat the spread of syncopation to a more generalized phonological environment, but it appears to be a secondary factor

The appearance of class 4 prefix forms such as miN- is another matter. Taking the viewpoint most unfavorable to hypothesis (1b), these forms were categorized as syncopated (note 6). This would imply that mi m or mi > N, merging with the singular prefix, and that mi- was reintroduced as the mark of the plural, perhaps by analogy with forms in a conservative context. This process appears to be in progress in DUALA. The class 3 and the class 4 prefixes have merged in the prelabial environment. and sometimes ('zuweilen') elsewhere However, the class 4 syncopated prefixes have variants in mim- and miN- for many words (Ittman 1939).

This is not the only possible order of events, and it may not be the usual one Some similar combinations can be found for other prefixes For example, in KAA the singular class 1 prefix is N- and the plural (class 2), originally ba-, is baN- Here there is no question of an intermediate process ba > N [7] Nekes (1911) claims that this sequence is the source of the class 4 miN- prefixes in YAUNDE, but I can see no way to justify this choice from his data

[7] No more than we would consider that appearance of the class 6 prefix in the form maN- (as in KELE, NGONDI, PANDA, and others) where it serves to mark the plural of class 9 nouns (singular prefix N-) is evidence for the process ma- > m- The prefix retains its form ma- in its other functions in these languages.

It is in such analogic reshaping of forms that paradigmatic markedness appears to have its greatest effect. Somehow it would seem quite inconceivable that class 3 nouns could reintroduce mu- as a marker of the singular; on the other hand, it does not seem so far-fetched that a hypothetical paradigm of singular mi-/plural mu- should change to singular mi-/plural m-.

8.2.3 DUALA and the missing quantifiers. Figure 2 has one entry in the category nonsyncopated mu- and syncopated mi- : $DUALA_1$. Hypothesis (1b) predicts that this cell is empty. Retention of mu- as the class 1 prefix in DUALA is not a counterexample, since syncopation is found in the class 3 prefix. However, this example indicates that the statement of our hypothesis was not sharp enough. What is missing is a precise quantification of the predicates. As it turns out, this can become fairly complicated. From the definitions used to categorize the data (section 6) it was clear than an existential quantification was implied for the hypothesis. That is, roughly,

(1b') For every language L, if for some mi in L, mi > m̩, and mu exists in L, then for some mu, mu > m̩.

This excludes DUALA as a counterexample, as well as a hypothetical language in which the sequence mu does not occur. From a processual point of view, however, this does not appear sufficiently restrictive. Consider a hypothetical Bantu language in which the class 4 mi- prefix has become syllabic [m̩] preconsonantally, and the class 1 and class 3 mu- prefixes have become syllabic [m̩] only before labial consonants. I at least would want to frame an initial hypothesis which predicted that such a case would not occur, for if it did occur I would begin to doubt the weaker statement (1b'). We are led to the further modification

(1b'') For every language L, and every environment X in L, if for some mi in X, mi > m̩, then for all mu in X. mu > m̩.

The data we have at hand are consistent with this restatement. For example, in DUALA syncope occurs regularly in class 3 and class 4 prefixes before labial consonants, and for certain words before other consonants; but it appears that for a given word, both prefixes are syncopated or else neither is. For most of the languages, the detailed environments of syncope are not stated, unfortunately, and so it cannot be said that the data are a severe test of hypothesis (1b'').

Our final statement (1b'') is still not completely precise, owing to the flexibility of the term 'environment'. To illustrate the difficulty involved here, consider a hypothetical Bantu language in which class 1 mu- prefixes are syncopated before labial consonants, class 3 mu- prefixes retain their full form, and class 4 mi- prefixes are syncopated before labial consonants. Does this violate (1b'') or not?

9. Intermediate stages in the development of syllabic nasals. As a side benefit, the investigation provided some interesting information about the stages in the development of syllabic nasals. Our inferences are based on a score of well described languages in which the prefixes take different forms in various preconsonantal environments.

9.1 The critical environments. Three environments appear to have the greatest influence in development of nasal consonants from the Bantu mu- and mi- prefixes: class 1 versus class 3, before labial consonants versus before nonlabial consonants, and in accented position versus in unaccented position. Less important factors, or perhaps less well documented in our sources, are the environments before continuants versus before stops, and before nasal + consonant clusters versus before simple consonants.[8]

9.1.1 Class 1 versus class 3. Eight languages show different developments of syncope and syllabicity in class 1 and class 3. The pattern is not consistent. DUALA and TSONGA have syncopated class 3 prefixes but not class 1 prefixes; in KGALAGADI and DABIDA, syncopation appears only in class 1. Some class 3 forms in MASHAMI have retained mu- but the prefixes are syncopated elsewhere.

NYANJA is more complicated. Class 1 prefixes are syncopated (except in muntu 'person' and perhaps other cluster-initial roots) and class 3 prefixes are syncopated only in unaccented contexts. The syncopated prefixes in CHOPI are syllabic in class 3, nonsyllabic in class 1, while for KAA, class 1 prefixes are syllabic and class 3 prefixes nonsyllabic. Note also that in NYOKON, the two classes have developed distinctive vowel quality: the class 1 prefix is o- and the class 3, U-. We conclude only that syntactic categories can be an effective barrier to the phonological generalization of a process.

The class 18 locative prefix has not survived in 41 of the sample languages. In some further cases, such as VENDA, it survives only as a frozen form in adverbs. Elsewhere the description of its phonetic form is consistently poorer than for the more common noun prefixes, so that a clear picture is hard to obtain. It appears to be less frequently syncopated, never unless either the class 1 or class 3 prefix is syncopated. In 13 cases its form is given as mu- when one of the other mu- prefixes has become syncopated in some subenvironment, but the data are so sparse that it is impossible to be sure that these really represent different developments, not just citations of a basic form.

---

[8] The data from SHONA, NREBELE, SOTHO, and TSWANA (Sec. 9.2.2) show syllabic [m] developing earlier before labial stops than before labial continuants. A number of languages (KONGO, YOMBE, VILI, MWERA, KONDE, NYANJA, and TERI) have syncopated mu- prefixes except before nasal + consonant clusters.

9.1.2 Labial versus nonlabial following consonant. The prelabial environment appears to favor syncope in the prefixes. DUALA's class 3 and 4 prefixes are m- prelabially, mu- elsewhere, except for rare instances of homorganic N-. SHONA's class 1 and class 3 prefixes are mu- except in nonstressed position before bilabial stops and affricates (excluding b!). In NREBELE the preconsonantal form is mu- except that mu+bX mmX; similar processes are SOTHO mo+bX ~ mmX and mo+fX ~ mhX ~ mofX. In VENDA the mu- prefixes are said to be [m] 'rarely'; the only example cited is mpongo (Ziervogel and Dan 1961. 33). No cases of syncope were found in nonlabial environments without syncope in labial environments.

In MPONGWE loss of the nasal is affected; the class 1 and 3 prefixes are [o-] except before bilabial consonants, where they are [om-], and the class 4 prefix has the parallel forms [I-] and [Im-].

9.1.3 Accented versus nonaccented position. The penultimate syllable is usually accented in Bantu languages, marked by stress or length, or both. The stress group includes the noun prefix so that the noun prefix of a monosyllabic noun is accented. The accented environment is relevant to both syncope and syllabicity. In ZULU, SWAZI, TSONGA (class 3 only), and SHONA, the mu- prefixes have remained mu- in accented position, but are syncopated elsewhere (in SHONA only before labials). In KALANGA and LILIMA the class 1 and 3 prefixes are syllabic [N-] in accented position, nonsyllabic [N-] elsewhere. In YAO they are [m- and [m-] respectively. This influence is also found in Bantu languages for the nasal prefix of class 9: for example, in SWAHILI, SOTHO, TSWANA, and VENDA the prefix is syllabic only when in accented position.

9.2 Intermediate states in development of syllabic nasals. The favored context for development of syllabic nasals from sequences of mu- is in unaccented position before a labial consonant, as in SHONA. From there the change may spread to accented position, as perhaps in DUALA, or else to nonlabial consonants, as in SWAZI. The same sequence presumably could take place with resulting nonsyllabic nasals, and perhaps this is what has happened in TSONGA, whose state is the nonsyllabic counterpart of SWAZI's; on the other hand, the forms of TSONGA could also have resulted from a state like that of SWAZI by loss of syllabicity.

Development of homorganicity in the nasal prefix shows a pattern that is definitely different from that of syllabicity. First, when we cross-classify the languages in which both mu- and mi- prefixes are syncopated according to homorganicity (Figure 4) we see that they are either both homorganic or both nonhomorganic. Further, no evidence was found that homorganicity is conditioned by any of the three critical environments (Section 9.1). Finally, we note that there appear to be two processes leading to homorganic nasals from m + vowel sequences. The first begins with syncope before labial consonants; further extension of syncope is simultaneous with assimilation of the nasal to the following consonant. This is probably the process in progress in DUALA, where Ittman (1939) reports the class 3 prefix is regularly m- before labials and sporadically [N-] elsewhere. A second possible process would be generalization of syncope to the entire preconsonantal environment, followed by assimilation of labial nasals to the following consonant.

MU- PREFIXES	MI- PREFIX + homorganic	MI- PREFIX - homorganic
+ homorganic	3	0
- homorganic	0	6

Figure 4. Summary of Bantu languages with syncopated mu- and mi- prefixes according to homorganicity

With or without concomitant development of homorganicity, syncope may spread to the entire environment, leaving syllabic or nonsyllabic nasals. The attested 'final' states are illustrated by SWAHILI (- homorganic; +syllabic in all contexts), YAO (- homorganic; + syllabic if accented, - syllabic otherwise), KALANGA (+ homorganic; + syllabic if accented, - syllabic otherwise), and FANG, KONGO, and others (- homorganic; + syllabic in all contexts).

There is little in the data to tell us how syllabic nasals are lost or become nonsyllabic. Harries (1950) says that the syllabic nasals in MWERA are dropped or become nonsyllabic in 'normal quick speech'. Doke (1931) cites alternations in KALANGA like [n̩.nV]~[ṋ:V]. The previously cited case of MPONGWE (Section 9.1.2) suggests that the prelabial context may favor retention of the (possibly nonhomorganic) nasal. Comparative study of the class 9 and 10 Bantu prefixes would be expected to provide extensive information on loss of syllabic nasals in preconsonantal position.

9.3 Enumeration of intermediate states. As a basis for further work it is perhaps useful to place the observations above in a more formal framework. Four basic phonological environments are defined by the possibilities ± accented and ± labial. For our purposes we assume that in each environment there are five possible forms for the prefix. One is nonsyncopated, symbolized by 'mu'. Four are syncopated: - syllabic and - homorganic, symbolized by 'm̭'; - syllabic and + homorganic, 'Ṋ'; + syllabic and - homorganic, 'm̩'; and + syllabic and + homorganic, 'N̩'. For the labial environments there are actually only three possibilities, since 'm̭' and 'm̩' are effectively identical to 'Ṋ' and 'N̩' respectively. We shall represent each state by a vector $(f_{11}, f_{10}, f_{01}, f_{00})$, where $f_{\alpha\beta}$ is the form of the prefix in the environment α accented and β labial, and $\alpha = 1$, $\beta = 1$ correspond to + accented, + labial. For example, (mu, mu, m̩, mu) is the state in which syncope has resulted in a syllabic nasal in unaccented, prelabial contexts.

This framework yields 3 x 5 x 3 x 5 = 225 logically possible states. Most of these can be eliminated under the following assumptions. The first is that syncope in accented environments implies syncope in unaccented environments; the second, syncope in nonlabial environments implies syncope in labial environments; and the third, syllabicity in unaccented environments implies syllabicity in accented environments. These assumptions are supported by the data of Sections 9.2.2 and 9.2.3. The first two assumptions define 130 forbidden states, the third an additional 33, leaving 62 possible states; these are presented in part in Figure 5, together with the transitions I have tentatively assumed to be possible.

Given suitable data, the number of possible states might be reduced even more. For example, I feel that states like (mu mu m̩ N̩), with syllabic nonlabial nasals and nonsyllabic labial nasals (all homorganic), are somewhat unlikely.

There are several advantages to presenting states and processes exhaustively in this way. It shows dramatically how restricted, though still numerous, the possibilities of change really are. The intimate connection between state and process is revealed directly; if there is an attested state, some process must lead to it, and if we find no acceptable process leading to an unattested state, we must simultaneously consider the possibility that it is forbidden. In some cases we may be led to suppose that a state is permissible because it appears to have been a source for an attested state.

Even with so little data as we possess for a network of this size (about 20 languages), some interesting questions are raised. It is striking that so few states are attested. This suggests that some states are more stable than others, or almost equivalently, that certain transitions are more likely. A possible attack on this question is suggested by the further observation that the attested states are 'corner' states which, because of the way the arrays are laid out, represent maximum or minimum spread of syllabicity or homorganicity. Compare SWAZI (mu mu m̩ m̩) with an 'interior' state (mu mu m̩ m) on the same line. It may be that such states are most stable and the remainder, though possible, serve mainly as 'states of transition' of short duration. The present state-process formulation should facilitate the rigorous formulation and testing of this and similar notions.

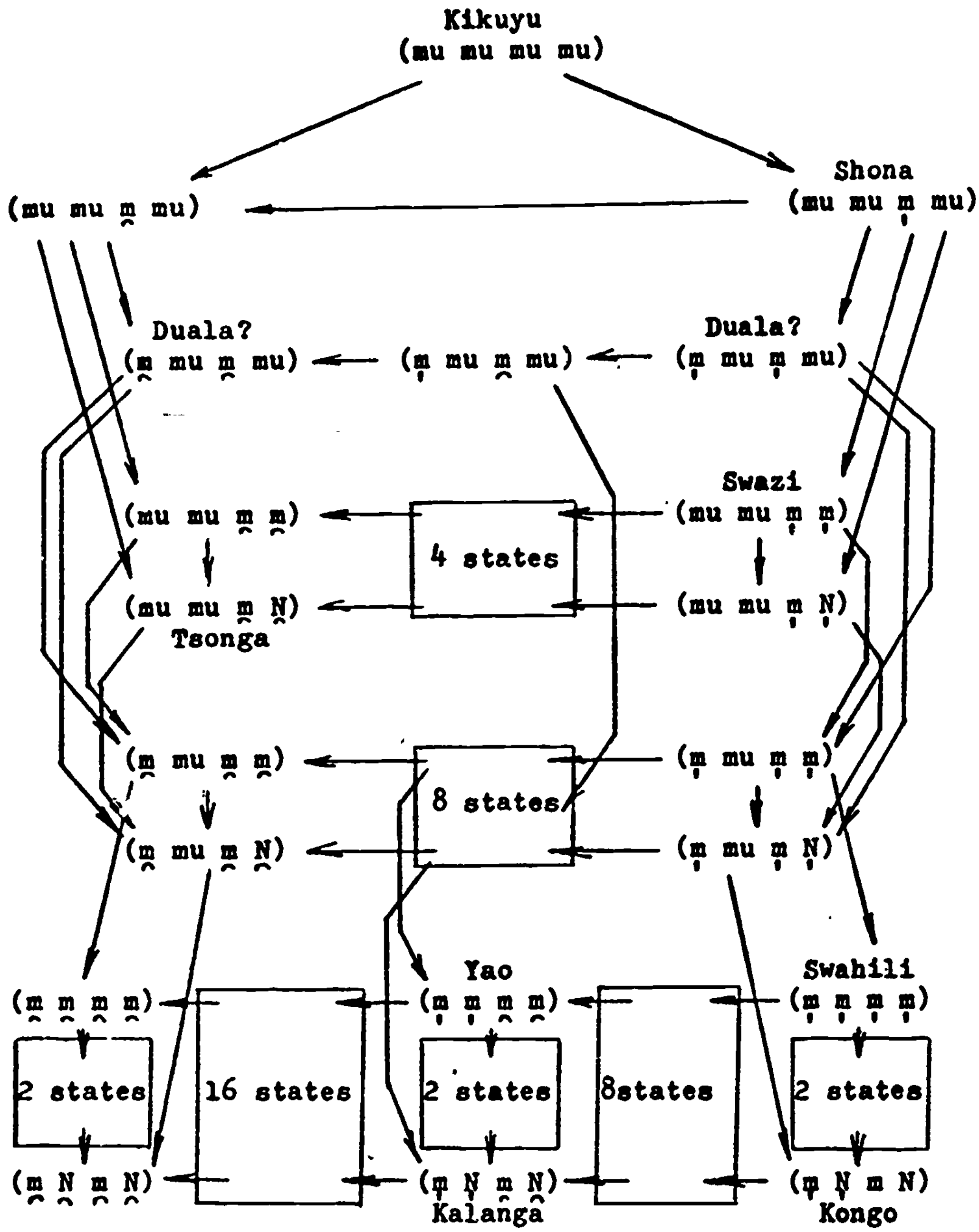

Figure 5. Partial representation of the intermediate states and processes in the development of syllabic nasals in Bantu noun class prefixes. Attested states are labelled with one of the languages they represent. See text for interpretation of the state vectors. The boxes stand for the indicated number of states not explicitly represented in each row.

10 List of languages. The languages in the sample are listed by groups according to Bryan (1959) The following abbreviations are used for sources: WEA - Guthrie (19_ M&W = Meinhof and Warmelo (1932). NBor2 = Richardson (1957). and NBor4 = Tucker and Bryan (1957).

Lundu: LUNDU (WEA)

Mbo: BAFAW. KAA. MBO (WEA)

Duala: DUALA (Ittman 1939)

Bube: BENGA (WEA)

Yaunde-Fang: FANG (WEA). YAUNDE (Nekes 1911)

Makaa: MAKAA (WEA)

Myene: MPONGWE (WEA)

Kota KELE (WEA)

Tsogo TSOGO (WEA)

Shira-Punu PUNU (WEA)

Njabi. NZEBI (WEA)

Mbete: MBETE (WEA)

Teke-Yans TEGE, TIINI (WEA)

Pande: NGONDI (WEA). NGANDO (NBor2)

Mboshi: AKWA (WEA)

Nbala BOBANGI (Whitehead 1899), LINGALA (Guthrie 1939)

Kongo: BEMBE, NORTH KONGO, CENTRAL KONGO, VILI (Laman 1936); YOMBE (DeClercq no date)

Kimbundu: KIMBUNDU (Chatelain 1888-89)

Luyana: LUYI (Jacottet 1896)

Nyakyusa: KONDE (M&W)

Bemba BEMBA (Sims 1959)

Ila: SUBIYA (Jacottet 1896). TONGA (Hopgood 1953)

Lega: LEGA (Meeussen 1960)

Nande KONZO (NBor4)

Nyali. VANUMA (NBor4)

Inter-Lacustrine GANDA (Cole 1967), RUNDI (Meeussen 1959)

Gisu: GISU (NBor4)

Luhya LUHYA (NBor4)

Gusii GUSII (NBor4)

Kikuyu KIKUYU (NBor4, Barlow 1960)

Shaka MASHAMI (Muller 1947), MOSHI (NBor4)

Sukuma SUKUMA (NBor4)

Nilyamba NILYAMBA (NBor4)

Gogo GOGO (NBor4)

Shambaa SHAMBAA (NBor4)

Zaramo: NGULU, ZIGULA (NBor4)

Taita DABIDA, POKOMO, TERI (NBor4)

Swahili SWAHILI (Polome 1967)

Yao MACONDE (Guerreiro 1963), MWERA (Harries 1951), YAO (Sanderson 1954, Whiteley 1966)

Tumbuku TUMBUKU (Turner 1952)

Nyanja: NYANJA (Chiteji 1969)

Shona. KALANGA LILIMA (Doke 1931, 1954), ZEZERU (Doke 1931)

Venda: VENDA (Doke 1954, Ziervogel and Dan 1961)

Sotho-Tswana: KGALAGADI, KUTSWE, LOZI, PULANA, SOTHO, TSWANA (Doke 1954, Cole 1955); PEDI (M&W)

Nguni: NGONI (Doke 1954), NREBELE (Ziervogel 1948), PHUTHI (Doke 1954), SWAZI (Doke 1954, Ziervogel 1948), XHOSA (Jordan 1966), ZULU (Doke 1954, Ziervogel 1967)

Tsonga. TSONGA (Doke 1954)

Chopi: CHOPI (Doke 1954), TONGA (Doke 1954)

Herero HERERO (Seidel no date)

REFERENCES

Barlow, A. Ruffell. 1960. Studies in Kikuyu grammar and idiom. Edinburgh.

Bell, Alan. 1969. On syllabic consonants. Paper presented at annual meeting, Linguistic Society of America, San Francisco, 31 December 1969.

Bot Ba Njock, H. M. 1962. La description phonologique du Basa (Mbene). Thèse du doctorat, Université de Paris.

Bryan, M. A. 1959. The Bantu languages of Africa. London.

Chatelain, Heli. 1888. Grammatic elementar do Kimbundu. Geneva. (Reprinted 1964, Gregg Press.)

Chiteji, Frank. 1969. Personal communication.

Cole, D. T. 1955. Introduction to Tswana grammar. London.

________. 1967. Some features of Ganda linguistic structure. Johannesburg. (Also African Studies 24, 3-54, 71-116, 199-240 [1965].)

DeClercq, L. (No date.) Grammaire du kiyombe. Bibliothèque-Congo 5, Brussels.

Doke, Clement M. 1931. A comparative study in Shona phonetics. Johannesburg.

________. 1954. The southern Bantu languages. London.

Greenberg, Joseph H. 1966. Language universals. The Hague: Mouton.

________. 1969. Some methods of dynamic comparison in linguistics. Substance and structure of language, ed. by Jaan Puhvel. Berkeley and Los Angeles: University of California Press.

Guerreiro, M. Viegas. 1963. Rudimentos de língua maconde. Lourenco Marques.

Guthrie, Malcolm. 1939. Grammaire et dictionnaire de Lingala. Cambridge. (Reprinted 1966, Gregg Press.)

________. 1953. The Bantu languages of Western Equatorial Africa. London: Oxford University Press.

Harries, Lyndon. 1950. A grammar of Mwera. Johannesburg.

Hopgood, C. R. 1953. A practical introduction to Tonga. London.

Ittman, Johannes. 1939. Grammatik des Duala (Kamerun). Berlin.

Jacottet, E. 1896. Etudes sur les langues du Haut-Zambèze, première partie, Grammaires Soubiya et Louyi. Paris.

Jordan, A. C. 1966. A practical grammar in Xhosa. Johannesburg.

Laman, K. E. 1936. Dictionnaire Kikongo-Francais. Brussels. (Reprinted 1964, Gregg Press.)

Meeussen, A. E. 1959. Essai de grammaire Rundi. Tervuren.

________. 1960. Eléments de grammaire lega. Tervuren.

Meinhof, Carl. 1948. Grundzüge einer vergleichenden Grammatik der Bantusprachen Hamburg.

__________ and N. van Warmelo. 1932. Introduction to the phonology of the Bantu languages. Berlin.

Müller, Emil. 1947. Wörterbuch der Djaga-Sprache (Madjame-Mundart). Hamburg.

Nekes, P. Hermann. 1911. Lehrbuch der Jaunde-Sprache. Berlin.

Polomé, Edgar C. 1967. Swahili language handbook. Washington.

Richardson, Irvine. 1957. Linguistic survey of the northern Bantu borderland. v. 2. London.

Sanderson, G. M. 1954. A dictionary of the Yao language. Zomba.

Seidel, A. (No date.) Praktische grammatiken der Hauptsprachen Deutsch-Südwestafrikas--I. Nama II. Otyiherero III. Oshindonga, 2nd ed. Vienna and Leipzig.

Sims, George W. 1959. An elementary grammar of Cibemba. Fort Roseberry.

Tucker, A. N. and M. A. Bryan. 1957. Linguistic survey of the northern Bantu borderland, v. 4. London.

Turner, W. Y. 1952. Tumbuka-Tonga English dictionary. Blantyre.

Vansina, J. 1959. Esquisse de grammaire Bushong. Tervuren.

Whitehead, John. 1899. Grammar and dictionary of the Bobangi language. London. (Reprinted 1964, Gregg Press.)

Whiteley, W. H. 1966. A study of Yao sentences. Oxford.

Ziervogel, D. 1948. Notes on the noun classes of Swati and Nrebele. African Studies 7, 59-70.

__________. 1967. A handbook of the Zulu language. Pretoria.

__________ and R. S. Dan. 1961. A handbook of the Venda language. Pretoria.

WORKING PAPERS ON LANGUAGE UNIVERSALS

Number Two

January 1970

Language Universals Project
Committee on Linguistics
Stanford University
Stanford, California