

HISTORICAL EVIDENCE FOR ABSTRACT PHONOLOGICAL ANALYSES

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A frequent criticism leveled against abstract phonological analyses is that such analyses are "not psychologically real". Direct psycholinguistic experimentation often fails to resolve convincingly the question of the reality of abstract analyses; evidence may, however, be drawn from historical change to support or refute their psychological reality. Hooper [1976] does argue for a concrete view of phonology by using evidence from language change. It is the purpose of this paper to argue for an abstract phonological analysis of the nasal + consonant sequences at a historically earlier stage in *Kimatúmbi*, a Bantu language spoken in southern Tanzania. I shall show that Proto-Bantu nasal + voiceless consonant sequences are historically changed to nasal + voiced consonant on the surface and that this rule has been a synchronic rule throughout the history of Kimatumbi. I then demonstrate that every surface nasal + voiced consonant sequence is synchronically analysed as an underlying nasal + voiceless consonant, including nasal + voiced sequences deriving from Proto-Bantu nasal + voiced consonant. Next I show that the initial cluster *mm* may derive from either Proto-Bantu \**m̥y* + *b* or \**m̥y* + *m*, but the *mm* cluster of the borrowed word *mm̥y̥t̥y̥ka* 'car' is reanalysed on phonologically abstract lines as deriving from underlying \**m̥y* + *b*.

Kimatumbi, along with many other Bantu languages such as Kikuyu and Mwera, has undergone a historical change whereby Proto-Bantu \*nasal + voiceless consonant becomes nasal + voiced consonant. This change is particularly prevalent in nouns of class 9-10. The following examples illustrate this change in Kimatumbi.

(1) Proto-Bantu	Kimatumbi	
* <i>mpáka</i>	<i>mbaká</i>	'cat'
* <i>ŋkáŋga</i>	<i>ŋgaangá</i>	'guinea fowl'
* <i>ntémbó</i>	<i>ndeémbó</i>	'elephant'
* <i>mpéembe</i>	<i>mbeembé</i>	'horn'
* <i>muntu</i>	<i>m̥y̥nd̥y̥</i>	'person'
* <i>ŋkungúni</i>	<i>ŋg̥y̥ŋg̥y̥ni</i>	'bedbug'

This phonological change merges the Proto-Bantu sequence nasal + voiceless stop with the sequence nasal + voiced stop, since the latter sequence is phonetically unchanged in Kimatumbi:

(2) Proto-Bantu	Kimatuumbi	
*mbabadá	mbabalá	'bushbuck'
*mbúdj	mbwǎ	'goat'
*mbúa	mbwá	'dog'

The addition of this historical change entails that, for any surface nasal + voiced consonant sequence in the language, a decision must be made in the synchronic grammar whether such sequences derive from underlying nasal + voiceless consonant or nasal + voiced consonant. The post-nasal voicing rule must have been a viable rule throughout the history of Kimatuumbi, since it is employed in a wide range of morphological constructions, apart from Class 9-10 nouns: the nasal prefix is also employed for adjective agreement with classes 8, 9, and 10 (cf. alternations such as *ngeéle* 'red (cl.9)' versus *lykeéle* 'red (Cl.11)') and for 1st person singular subject and object agreement on verbs (*ndekeké* 'I should cook' versus *utekeké* 'you should cook'). There has consequently been ample evidence from other morphological constructions to support the continued existence of the post-nasal voicing rule.

Since noun stems in class 9-10 have always been preceded by the nasal prefix *n*, the stem initial consonant has been subjected to the effects of the voicing rule in all of its allomorphs. No morphophonemic alternations are available to give evidence for the underlying status of a post-nasal consonant. An abstract analysis would derive all such stems from nasal + voiceless consonant, i.e. phonetic *mbaká* would derive from underlying *mpaká* 'cat'; a concrete analysis would analyse these sequences as underlying nasal + voiced consonant, identical to their surface form.

A subsequent change in the morphological system of noun class prefixes allows us to see that the abstract analysis has been selected in all cases where there was no evidence from morphophonemic alternations to show whether the underlying consonant was voiceless or voiced. Originally, Proto-Bantu nouns with a singular in Class 9 formed their plural with the Class 10 prefix. Both prefixes were simply a nasal consonant. However, the vast majority of nouns with singular in Class 9 now select their plural in Class 6, using the prefix *ma-* instead of the prefix *n*. The result is that a wide number of noun stems are no longer subjected to the influence of a nasal prefix in all their surface manifestations. In every case, a surface voiced consonant after a nasal is reanalysed as deriving from an underlying voiceless consonant, regardless of whether the consonant was historically voiced or voiceless.

(3) Proto-Bantu	Kimatuumbi sg.	pl.	
*mbúa	mbwá	mapwá	'dog'
*mbabadá	mbabalá	mapabála	'bushbuck'
*mbúdj	mbwǎ	mapwǎ	'goat'
*mbango	mbaángo	mapáangó	'warthog'
*mbutuká	mbutuká	maputúka	'antelope'

Proto-Bantu	Kimatuumbi sg.	pl.	
*mpémbé	mbeembé	mapéembé	'horn'
*ŋkúku	ŋgúku	makúkú	'chicken'

The abstract analysis would predict that historical voiced consonants after nasals would appear as voiceless consonants when the nasal consonant is not present; the concrete analysis would incorrectly predict that historical voiceless consonants after nasals would appear as voiced consonants when the nasal is not present. The concrete analysis would thus predict that the plural of ŋgúku should be \*magúkú, but this state of affairs is never attested in the language. The selection of a phonologically abstract analysis in the history of Kimatuumbi supports the psychological reality of abstract phonological analyses.

An important step in the argument for the abstract analysis is that a reanalysis takes place only when there is no evidence from morphophonemic alternations to motivate a voiced versus a voiceless consonant after a nasal consonant. Thus, since no adjective occurs exclusively in Class 9-10, the stem initial consonant will not be subjected to the influence of the nasal in all its allomorphs. Furthermore, in nouns which select the singular prefix |ɥ- 'Cl.11' and n- 'Cl.10' in the plural, there was evidence for the underlying nature of the stem initial consonant in the singular, since the effect of the nasal is not found after the prefix |ɥ-. The examples in (4) show that any noun which originally was in Class 11-10 retains the etymological voiced ~ voiceless distinction in Kimatuumbi.

(4)

Proto-Bantu	Kimatuumbi sg.	pl.	
*badɥ	lɥbáɥ	mbáɥ	'rib'
*god	lɥgó	ngó	'rope'
*dímf	lɥlímf	ndímf	'tongue'
*kungúni	lɥkúɥŋgɥn	ŋgɥúŋgɥn	'bedbug'
*tondwa	lɥtoóndwa	ndoóndwa	'star'

It could thus not be argued that devoicing of the stem initial consonant is a concomitant feature of being a noun with an allomorph in Class 9-10.

The second piece of historical evidence for abstract phonological analyses comes from a reanalysis of the geminate nasal mm. The proto-Bantu Class 1 and Class 3 prefixes \*mɥ- have undergone a reduction in Kimatuumbi (as well as in other languages such as Swahili) whereby the vowel ɥ is lost after the labial consonant. The nasal consonant assimilates in place of articulation to the following consonant:

(5)

Proto-Bantu	Kimatuumbi	
*mɥkóŋgo	ŋkóŋgó	'tree'
*mpúko	mpúkó	'bag'

Proto-Bantu	Kimatuumbi	
*mɥpaká	mpaká	'boundary'
*mɥkáte	ŋkaáte	'bread'

When the stem initial consonant was historically *d*, *g* or *b*, the stem initial obstruent has been nasalized, producing a geminate nasal cluster:

(6) Proto-Bantu	Kimatuumbi sg.	pl.	
*mɥdángi	nnaáí	m laáí	'bamboo'
*mɥgunda	ŋgúynda	m gúynda	'field'

The existence of this nasalization rule yields two potential analyses for any initial geminated nasal in Kimatuumbi. Either a surface geminated nasal may be analysed as deriving from *mɥ* + nasal (a concrete analysis), or it may be derived from underlying *mɥ* + voiced consonant (an abstract analysis). There are, as far as I can determine, no examples of Proto-Bantu *mɥ* + nasal in Kimatuumbi. However, there is a loanword *mmɥtúka* 'car', borrowed eventually from English 'motorcar' which has an initial geminate nasal which is not derived historically from the sequence \**mɥ* + voiced stop. This word has, however, undergone a reanalysis along abstract lines, where the initial stem consonant is analysed as an underlying voiced consonant *b*, as shown in the plural form *m|bytúka* 'cars'. Again, the etymologically unjustified voiced stop can be explained only by assuming the abstract analysis, rather than the concrete analysis, in Kimatuumbi.

In summary, I have argued, using historical facts from Kimatuumbi, that an abstract analysis of a phonological system can be psychologically real. One of the arguments advanced by Hooper [1976] against abstract phonological systems is the purported lack of evidence from historical change demonstrating their "psychological reality". Hooper gives some evidence that grammars may be historically reanalysed along concrete lines. For her argument against abstract phonology to be convincing, it would be necessary for there to be no historical evidence in support of abstract analyses. The data discussed here present such historical evidence.

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#### REFERENCE

- Hooper, J. 1976. *An Introduction to Natural Generative Phonology*. New York: Academic Press.