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NASAL CONSONANT PROCESSES IN KITHARAKA

KITHAKA wa MBERIA
University of Nairobi, Kenya

ABSTRACT

The paper discusses three processes that make nasal consonants and especially /n/ the most dynamic area of Kitharaka (a Bantu language spoken in Kenya) phonology. Whereas the language has four underlying nasal segments, it has eleven consonants at the phonetic level.

Keywords: Kitharaka, Bantu languages, phonology

INTRODUCTION

In this paper we discuss three phonological processes in Kitharaka, namely homorganic nasal assimilation, nasal palatalization and nasal devoicing[1]. That the first two processes operate in Kitharaka is evidenced by direct data. The contention that the third process operates in the language is deduced circumstantially. Kitharaka has a velar consonant devoicing rule otherwise referred to as Dahl's Law. There is convincing evidence from Kitharaka as well as from a number of other Bantu languages (where Dahl's Law operates) that Dahl's Law is conditioned by a voiceless consonant. In Kitharaka, however, the rule also operates when the first consonant following a velar consonant is a nasal consonant occurring in a nasal consonant-obstruent cluster. With support from the data, we argue that Kitharaka has a nasal consonant devoicing rule and that the nasal consonants so devoiced trigger the operation of Dahl's Law, as is also the case with the inherently voiceless consonants.

1. HOMORGANIC NASAL ASSIMILATION

In Kitharaka, the 1st person singular is marked by /n/ in the subject position. This is evidenced by comparing (1) and (2) below:

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[1] Kitharaka is a Bantu language spoken in Kenya. According to Guthrie's classification of Bantu languages, Kitharaka belongs to the Gikuyu-Kamba Group, specifically E55. According to the Möhlig-Heine classification of Kenyan languages, Kitharaka falls under the Central Kenya Bantu Group.

(1)	nio	I
	nioɣo	I
	niŋgwa	I myself (emphatic)

(2)	tio	We
	tioɣo	We
	twiŋgwa	We ourselves (emphatic)

When the prefix /n/ precedes a verb root beginning with a consonant, it assimilates to the point of articulation of the following obstruent. Thus:

(3)	/n + ʕ + ɛ /	→	[mpɛ]	that I give
	/n + o:r + ɛ/	→	[mbo:rɛ]	that I thrush
	/n + con +ɛ /	→	[ɲconɛ]	that I lick
	/n + joky +ɛ /	→	[ɲɟokyɛ]	that I take
	/n + kɛn +ɛ /	→	[ŋkenɛ]	that I be happy
	/n + it + ɛ/	→	[ŋgitɛ]	that I cut

These data show that, in all the instances, the alveolar nasal consonant adjusts to the point of articulation of the following obstruent. In other words, the alveolar nasal consonant becomes homorganic with the consonant it precedes. The rule that governs this change takes the following form:

(4)	+ cons	αant	+ cons
	+ nas	βcor	αant
	+ ant	γback	βcor
	+ cor		γback

Rule (4) stipulates that the alveolar nasal consonant agrees with the following obstruent for the features [ANTERIOR, CORONAL, BACK].

Rule (4) underlies the process of homorganic nasal assimilation; a natural phonological process. It is necessitated by the physiological properties of the vocal tract (Abercrombie, 1967). Consequently, it is a natural rule of the assimilative type (Schane, (1972). To use Hooper's rule categorization, Rule (4) is a p-rule in the sense that it contains only phonetic information in its environment (Hooper, 1976).

Although the data we have presented to illustrate homorganic nasal assimilation is drawn from verbs, homorganic nasal assimilation in Kitharaka is not restricted to this grammatical category. It also operates in the nouns of classes 9 and 10[2]. Let us look at the data in (5) below[3]:

[2] The data in (5) also show the operation of continuant hardening whereby fricatives become stops through regressive assimilation to the nasal (stop). Detailed discussion on continuant hardening in Kitharaka is beyond the scope of this paper. Suffice it to say that in Kitharaka

(5)	/n + pandi/	→	[mpandi]	grasshopper/grasshoppers
	/n + βaka/	→	[mbaka]	cat/cats
	/n + coɣa/	→	[ɲcoɣa]	hoof/hooves
	/n + riɣi/	→	[ndiɣi]	threads/strings
	/n + joke/	→	[ɲɟoke]	bee/bees
	/n + kingↃ/	→	[ŋkingↃ]	neck/necks
	/n + orwɛ/	→	[ŋgorwɛ]	pig/pigs

According to these data, /n/ has four surface manifestations, namely [m], [n], [ɲ], and [ŋ]. These manifestations precede bilabial, alveolar, patatal and velar obstruents, respectively. In addition, it may be noted that /n/ surfaces in four different phonetic forms owing to the operation of homorganic nasal assimilation.

In all the data in (5) the assimilation /n/ to the point of articulation of the following obstruent results from the early adjustments of the articulators in anticipation of the production of the obstruent. Such adjustments, which have the effect of harmonizing the point of articulation of the nasal consonant and the following obstruent, lead to "articulatory simplification" (Antilla, 1972:74). In other words, the homorganicity of the two segments succeeds in "producing some economy of effort in the utterance" (Abercombie, 1976:136).

A curious form of nasal consonant–obstruent homorganicity is found in the vowel initial verbs when used with the 1st person singular. In such forms, a homorganic nasal consonant obstruent sequence appears in the word-initial position. However, unlike the data in (3) and (5) above, the obstruent in the nasal consonant-obstruent pair is not easy to account for, given that the verbs have vowel-initial roots. Thus:

(6)	(a) [mbandɛ]	that I plant
	(b) [mbuɣɛ]	that I say
	(c) [mbɛndɛ]	that I love/like
	(d) [mbiŋgɛ]	that I close
	(e) [mbↃnɛ]	that I see
	(f) [mbinɛ]	that I sing

The verbs in (6) have vowel-initial roots as follows:

(7) (a) and
(b) uɣ
(c) ɛnd

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the process affects /r/ as well as all fricatives except / /and /s/. For more information on the issue see Wa Mberia (1981, 1993).

[3] Information from Hyslop Ipu, a native speaker of Kipokomo. Personal communication.

(d) iŋg
(e) ↄn
(f) in

The contention that the forms in (7) are indeed the roots of the subjunctive forms in (6) is supported by the imperative forms in (8), each of which consists of the root and the indicative mood morpheme {a}:

(8) (a) [anda] plant!
(b) [uɣa] say!
(c) [ɛnda] love/like!
(d) [iŋga] close!
(e) [ↄna] see!
(f) [ina] sing!

The word-initial [m] in (6) is derived from /n/, which, as we have seen above, is the 1st person singular subject marker. It is not, however, easy to account for [b] in the [mb] sequence. One possible analysis of the data in (6) is that [mb] is a morphologised 1st person singular subject marker. Hence, the homorganicity in the sequence does not result from synchronic homorganic nasal assimilation. It is part of the underlying representations resulting from morphologisation predating the current vowel-initial roots. The morphologised 1st person singular subject marker points to an earlier stage of the roots in (7). The roots had a bilabial obstruent which has since been diachronically deleted. Thus:

(9) (a) *βanda > and
(b) *βuɣa > uɣ
(c) *βɛnda > ɛnd
(d) *βinga > iŋg
(e) *βↄna > ↄn
(f) *βina > in

or alternatively:

(10) (a) *banda > and
(b) *buɣa > uɣ
(c) *bɛnda > ɛnd
(d) *biŋg > iŋg
(e) *bↄna > ↄn
(f) * bin > in

When prefixed with the 1st person singular marker, both (9) and (10) would result in a work-initial [mb] through homorganic nasal assimilation and continuant hardening (in the case of (9)) and homorganic nasal assimilation alone (in the case (10)). This, then, is the source of the morphologised [mb] in

the verb forms in (6).

It is important to point out that establishing the underlying nasal in class 9 and 10 prefixes is a problematic area in Bantu phonology. Whenever they occur, the nasal consonant-obstruent sequences are homorganic. Moreover, in the nouns with vowel-initial roots, the nasal consonant surfaces as [ɲ]. Hence, it is difficult to find an objective and foolproof criterion with which to assign either m, n, ɲ or ɳ as the underlying prefix for class 9 and class 10.

For want of a better underlying representation, Bantu linguists have in the past used /N/ as the underlying form of the prefixes in classes 9 and 10. Use of /N/ as the underlying form of the prefixes in classes 9 and 10 gave rise to the so-called N-class in Kiswahili studies by writers such as Ashton (1947), Wilson (1970) Myachina (1980) and Bakari (1985).

For the purposes of our discussion in this paper, we adopted /n/ as the underlying form of the noun prefixes in classes 9 and 10 in Kitharaka. We have adopted this position on the grounds that /n/ is the most natural nasal consonant (Hyman, 1975).

2. NASAL PALATALIZATION

At the phonetic level a number of nouns in classes 9 and 10 have a word-initial nasal consonant followed by a vowel. This is also true of some adjectives that qualify classes 9 and 10 nouns. Such a nasal consonant–vowel sequence is found, for instance, in the following data:

(11)	(a)	[ɲongo]	vine(s)
	(b)	[ɲambɔ]	pegs
	(c)	[ɲoɳgo]	cooking pot(s)
	(d)	[iɲiɳge]	many (c1 10)

Let us compare the forms in (11) with those in (12)

(12)	(a)	ro:ɳgo	a vine (cl.11)
	(b)	rwambɔ	peg (cl.11)
	(c)	kauɳgo	a small pot (cl.12)
	(d)	βaiɳge	many (cl.2)

The forms in (11) share the same roots with the corresponding forms in (12). However, whereas the forms in (11) belong to class 9 or class 10 depending on whether the noun is singular or plural), those in 12 belong to other classes as indicated. Comparing the forms in (11) with those in (12) clearly shows that the palatal nasals in (11) are noun class markers.

We need to explain how the underlying /n/ becomes a palatal nasal at the phonetic level. One is tempted to simply state that /n/ is realized as [ɲ] before vowels. This is the kind of treatment given by Polome in the case of a similar phenomenon in Kiswahili. He states that:

> /n/ →[ɲ] before a noun or adjectival stem with initial vowel e.g. in nyama 'meat' nyota 'star', nyuki,' bee' nyeupe, 'white' and nyingi 'much, many' applying to the nouns of the (n) class. Polome (1967:70)

Taken merely as a statement of fact, the above observation is useful; however, it is of little explanatory value. It does not reveal, much less explain, why /n/ becomes [ɲ] before a vowel.

Let us return to the data in (11), above. It is tenable to argue that in [iɲiŋge] /n/ becomes [ɲ] through a process of palatalization (whereby non-palatal consonants become palatalized before front vowels especially /i/). Such a process would be phonetically-motivated since a non-palatal segment would acquire the features [+ high, -back] from the high front vowel.

Whereas this line of reasoning would effectively account for the change /n/ → [ɲ] in [iɲiŋge], it does not account for those forms in which an underlying /n/ surfaces as [ɲ] when followed by a back vowel or non-high front vowel. It does not make much phonetic sense for /n/ to become [ɲ] when it precedes, for instance, /o/ as in [ɲoŋgo] or [ɲoŋgo]. We have, therefore, to look elsewhere for the motivation for the change.

According to Guthrie (1970/71), Common Bantu had /ni/ as the prefix for classes 9 and 10. In some Bantu languages /ni/ is still found as a prefix in classes 9 and 10. For instance, it is found in Upper Pokomo, as is evidenced by the data below:

(13)	nimbwa	mosquito
	nisu	fish
	nizi	housefly
	ninkɔ	banana plant
	nifwɛ	monkey
	ningwɛ	a portion for tiling in a shamba

If we can show that the surface forms in (11) have /ni/ as the underlying prefix, then we can argue that the surface forms in question are derived from their underlying representation by a natural rule of palatalization and a subsequent deletion of /i/. Thus:

(14)	A		B		C
	(a) /ni + oŋgo/	→	ɲyoŋgo	→	[ɲoŋgo]
	(b) /ni + amb + ɔ/	→	ɲyambɔ	→	[ɲambɔ]
	(c) /ni + oŋge/	→	ɲoŋge	→	[ɲongo]

(d) /i + ni + inge/ → iɲiŋge → [iɲiŋge]

At stage B two processes, namely, palatalization of the nasal consonant and gliding of the high front vowel, take place. The two processes can be seen as taking place simultaneously or as being intrinsically ordered (Hooper, 1976).

In spite of the possibilities presented by the above analysis, it should be observed that there is no clear empirical evidence that /ni/ is the marker for classes 9 and 10 in Kitharaka synchronic grammar. The above analysis, therefore, runs into problems on these grounds.

A second approach to the phenomenon of palatalization of /n/ before various vowels (including back vowels) requires that we assign a diacritic feature to any /n/ that is historically linked to */ni/. We could then argue that the diacritic feature (representing historical information) triggers the change [ ] before vowels. The rule for this analysis may be formulated as:

(15) +cons +high [+syll]
+nas → -back
+cor

_____
previously *ni

Unfortunately, the analysis proposed in (15) is also suspect. One may question whether the competence of Kitharaka speakers includes the kind of historical information assumed by the analysis. If their competence does not include such information, the analysis (including Rule 15) would amount to making a false claim on their linguistic ability.

A third approach to the phenomena of /n / changing to [ɲ] before any root–initial vowel is to resort to the concept of rule morphologisation (Hyman, 1975). It is conceivable that at some point in time the change was governed by a phonetically motivated rule of the form shown below:

(16) /n/ → [ɲ]/ --------i + v

Consequently, the rule was morphologised so that the change was occasioned, not by the high front vowel, but by any root-initial vowel. The prefix vowel subsequently underwent a historical deletion without any effect on the nasal palatalization.

It is not definite how we should handle the change of /n/ to [ɲ] before various vowels. However, one thing is certain. It is unjustifiable to lump the change together with changes that fall under homorganic nasal assimilation. There is nothing “hormorganic” about an alveolar nasal becoming palatal when followed, for instance, by a low back vowel. We have therefore chosen to call the change “nasal palatalization” since, indeed, that is what it is. Our view is that

whatever the actual formulation of the rule underlying this change, it is necessary to incorporate into it, in one form or the other, some role for /i/ or *i.

3. NASAL DEVOICING

Kitharaka has a consonant voicing rule otherwise referred to as Dahl's Law (Bennett (1977), wa Mberia (1981, 1993). The rule operates when a voiceless consonant in the prefix precedes a root whose first consonant is voiceless. Specifically, the voiceless consonants that condition the change are /p/, /t/, /c/ and /k/. Likewise, the rule operates in the environment of the clusters /mp/, /nt/, /ɲc/ and /ŋk/.

(17)	/ka + pandi/	→	[ɣapandi]	a small grasshopper
	/ke + tuɣe/	→	[ɣetuɣe]	a pole
	/ka + cuma/	→	[ɣacuma]	a small piece of iron
	/ke + kundi/	→	[ɣekundi]	a group
	/ka + n + poŋgo/	→	[ɣampoŋgo]	of Mpoŋgo
	/ka + n+ tɔŋgu/	→	[ɣantɔŋgu]	name of a place
	/ka + n +kɔrɔ	→	[ɣaŋkɔrɔ]	of the heart (cl.12)

Compare with:

(18)	/ka +βori/	____	[kaβori]	small goat, kid
	/ka +riɣi/	____	[kariɣi]	small thread
	/ka +ɗima/	____	[keɗima]	well
	/ka + jera/	____	[kajera]	path
	/ke +ɣiɲɔ/	____	[keɣeɲɔ]	a maggot, a caterpillar

As the data in (17) show, Dahl's Law is a dissimilation process whereby a voiceless consonant becomes voiced before another voiceless consonant. Given this description of Dahl's Law in Kitharaka, why then, one may ask, does the rule operate in the environment of /mp/, /nt/, /ɲc/ and /ŋk/? In such environments it seems that dissimilation occurs before nasal consonants, which are inherently voiced segments. That nasal consonants are indeed voiced in Kitharaka is demonstrated by the fact that Dahl's Law does not operate in forms such as the following:

(19)	/ka + mo + te/ _____	[kamote]	small tree, stick
	/ko + nɛnɛ/ _____	[konene]	big (cl. 17)
	/ke +ɲuruɲuru/ _____	[keɲuruɲuru]	name of a bird
	/ko + nar + a/ _____	[konara]	to scratch (inside a plot)

If Kitharaka nasal consonants are voiced as we have demonstrated in (19), why

then does Dahl's Law operate before nasal consonant-voiceless obstruent clusters? The answer to this question lies in the distinction between the nasal consonants in (19) and those that occur before voiceless obstruents. Let us consider (20) below:

(20)	(a) /ka + ɛmpɛ /	→	[ɣɛ:mpɛ]	small wooden honey container
	(b) /ke + mpɛ/	→	[ɣyɛmpɛ]	wooden honey container
	(c) /ko + nto/	→	[ɣonto]	somewhere (cl. 17)
	(d) /ka + nto/	→	[ɣanto]	something (cl. 12)
	(e) /ko + iɲcy + a/	→	[ɣwiɲcya]	to close the eyes
	(f) /ka + iɲc/	→	[ɣaiɲci]	small thorny shrub, small fence made of thorny branches
	(g) /ka + aŋki/	→	[ɣa: ŋki]	small fire

Whereas Kitharaka nasal consonants are inherently voiced, as showed in (19), those in (20) are devoiced by the following voiceless obstruents. Since these nasal segments surface as voiceless segments, they create an appropriate environment for the operation of Dahl's Law. Little wonder then, that Dahl's Law operates in (20). In the light of these observations, the phonetic forms in (20) result from the operation of two processes, namely, nasal devoicing and Dahl's Law.

	Underlying Representation	Nasal Devoicing	Dahl's Law
(20a)	(a) /ka + ɛmpɛ /	→ kɛimpɛ	→ [ɣɛmpɛ]
	(b) /kɛ + ɛmpɛ/	→ kyɛmpɛ	→ [ɣyɛmpɛ]
	(c) /ko + nto/	→ konto	→ [ɣonto]
	(d) /ka + nto/	→ kanto	→ [ɣanto]
	(e) /ko + iɲcy + a/	→ koiɲcya	→ [ɣwiɲcya]
	(f) /ka + iɲci/	→ kaiɲci	→ [ɣaiɲci]
	(g) /ka + aŋki/	→ ka: ŋki]	→ [ɣa:ŋki]

In all the forms in (20a) the obstruent conditioning the devoicing of the nasal consonant exists in the same morpheme with the nasal consonant. This need not be the case for the nasal devoicing rule to operate. The devoicing of the nasal consonant takes place even when the nasal consonant and the conditioning obstruent are separated by a morpheme boundary. The crucial prerequisite for the operation of devoicing rule is that the two segments have to be in the same syllable. The forms in (21), below, demonstrate nasal devoicing across the morpheme boundary:

(21)	/ka + a n + tor + a/	→ [ɣa: ntora/]	"of the village [cl. 12]"
	/ko + a n + purya/	→ [ɣwampurya]	"at Mppurya's (home)"

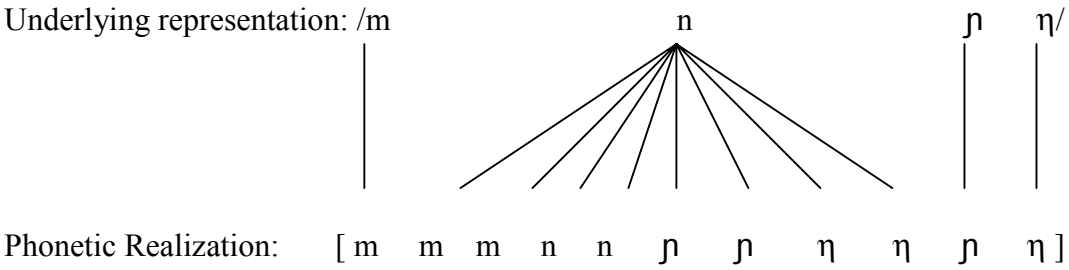
/ka + n/ + tan + ɛ/	→ [ɣantanɛ]	"let me circumcise"
/ka + n/ + ko:r + ɛ/	→ [ɣaɳko:rɛ]	"let me uproot"

With the information presented so far on nasal devoicing, we are in a position to formulate a nasal devoicing rule as in (22), below:

+cons			+ cons
+nas	→	[-voice]/ ___	-voice

5. CONCLUSION

The three processes discussed above make nasal consonants and especially /n/ the most dynamic area of Kitharaka phonology. Whereas the language has four underlying nasal segments, it has eleven nasal consonants at the phonetic level. Thus:



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