ANN.BULL.RILP(1991)No.25, 189-193

FURTHER EVIDENCE OF A NASAL-LIQUID ALTERNATION

Akio Soejima*, Shigeru Kiritani

1. Introduction

In Soejima et al.(1990)[1] we reported the nasal-liquid alternations found in some languages, not only in Indo-European languages such as English or Indo-Aryan languages, but also in genetically unrelated Far-Eastern languages such as Chinese, Korean or Japanese. At the present state we cannot conclude these alternations in those various languages have in common the same phonetic basis. However, the fact that these genetically unrelated languages show similar phenomena as to the alternation between stop nasals and (nasalized) liquids may suggest a phonetic affinity between these sounds, though the exact articulatory or acoustic properties involved are not quite clear. We don't yet have a clear idea of the phonological properties of this alternation, either. This is partly because the modular feature systems now advocated might not be capable of handling this alternation.

Recently, we have found other examples in some African languages. The most comprehensive description is the one on Gokana found in Hyman(1982)[2][3]. We will summarize Hyman's description first.

2. Gokana

Gokana is an Ogoni language (Benue-Congo branch of Niger-Kordofanian) spoken in East Nigeria. The phonetic system is indicated in Table 1. (The symbol m̈ represents a labiodental nasal consonant. In the following discussion tones are omitted.)

Table 1

Consonants:	p	t	k^y	k	kp	ʔ
	b	d	g^y	g	gb	
		f s				
		v z				
		l r				
	m	m̈ n	ɲ	ŋ		

---

* Tokyo Metropolitan University

Vowels: i u ĩ ũ m̩ N̩
e o
ɛ ɔ ɛ̃ ɔ̃
a ã

Tones: V́ (high) V̄ (mid) V̀ (low)

The canonical structure of Gokana lexical morphemes is

$$+C_1\ V_1\ (V)\ (\ C_2\ (V)\ )+.$$

All the possibilities are listed below.

CV	CVVC
CVV	CVCV
CVC	CVVCV

The consonants [r] and [n] cannot occur at the C_1 position, while the restriction on C_2 is more severe. That is, the consonants which can occur at this position are only [b, l, g, m, n, n]. Moreover, /b/ and /l/ alternate with [v] and [r] respectively at intervocalic positions. Thus /zib/ 'thief' is changed into /ziv-i/ 'this thief' and similarly /bɔl/ 'goat' is changed into /bɔr-i/ 'this goat' respectively. The environments in which [r] occurs are restricted to intervocalic positions and at those positions [l] never occurs so that we can conclude that there is no phonemic opposition between [r] and [l].

However, Gokana has more phonotactic constraints in terms of nasality both within and across stems.

1. If the C_1 is the [+nasal], then all successive segments must also be [+nasal].
2. If the C_2 is [+nasal], then any and all preceding and following vowels must also be [+nasal].
3. If a vowel or vowel sequence is [+nasal], then all successive segments must also be [+nasal].

As a result, If some segment is [+nasal], all the following segments are necessarily [+nasal]. That is, there is no opposition between [+nasal] and [-nasal] features after a [+nasal] segment. The second constraint predicts that the first [+nasal] segment cannot be C_2 at least at surface level. Therefore, the first [+nasal] segment at surface level may be C_1, V_1 or V_2, though Hyman does not show any V_2 examples.

To sum up, typical lexical morphemes in Gokana have the following phonological configurations.

A) All segments are [+nasal]
B) All segments are [-nasal]
C) C_1 is [-nasal], but all the following segments are [+nasal].

Hyman reported one more constraint, which is the most interesting for our present concerns.

4. If the C_1 is /v/, /l/ or /z/, then all successive segments must be [-nasal].

This constraint says that if C_1 is a voiced non-nasal continuant, there are no type-C configurations. In another words the sounds in constraint 4) block the nasalization of the following segments. Thus, when a certain morpheme includes /n/, that morpheme cannot have /l/ and vice versa. This situation is somewhat close to a complementary distribution for /n/ and /l/.

Another type of nasal-liquid alternation is also found in this language. It is related to the suffixation process. In this language, the suffixation process is conditioned by nasality in the stem morphemes in most cases. That is, most suffixes have two kinds of allomorphs: one nasal, and the other non-nasal. We will illustrate the case of verbal stems.

Verb forms have the following structure:

Verbal Stem + Grade Sfx + Pers Sfx # Obj Pro

In this formula only the verbal Stem is obligatory and the nasality following the verbal stem is determined by the verbal stem. Suffixes must alternate according to the nasality of the verbal stems. Thus

mm div-ee	'I hit him/her'
mm nɛ̃-ɛ̃	'I gave him/her (it)'

This suffix of the third person singular object takes an epenthetic sonorant, alveolar consonant when the verbal stems involve a sequence of like vowels. Thus

oo siirii-e	'you pl. caught him/her.'
oo ɪ̃ɪ̃nɪ̃ɪ̃-ɛ̃	'you pl. stung him/her.'

Here we can observe a nasal harmony. Evidently, it is the nasality of the stems that is responsible for the alternations between [n] and [r].

Similarly, suffixes beginning with consonants must alternate. For example,

ae ʔii	'it sank'	ae ʔiire	'he sank (it)'
ae pĩĩ̃	'he became quiet'	ae pĩĩ̃n	'he quieted (s.o.)'
ae gᵛɔɔ	'it became wet.'	ae gᵛɔɔve	'he wet (it)'
ae kãã̃	'it dried.'	ae kãã̃mɛ̃	'he dried (it)'

In this case [r] and [v] are phonetic realizations of /l/ and /b/. Thus, the realization of transitive suffixes are not symmetrical, for the alternation at the labial articulation is one between voiced stop and nasal, while the alternation at the dental-alveolar articulation is the one between liquid and nasal. Emphasis must be put on the fact that this language does have the voiced dental-alveolar stop /d/. That is, in this alternation liquids are preferred to voiced stops in spite of common expectation.

3. Sanskrit

The inflection of the word /ahan/ 'day' is irregular in that the stem /ahan/ alternates with /ahas/ as /ahanii/ 'dual Nom.' and /ahassu/ 'pl Loc.'. However, this /s/ seems to have originated from /r/. This can be evidenced by the existence of the reduplicated word /ahar-ahar/, though another alternating stem /aho-/ , which never occurs with stems terminating in /r/, weakens this interpretation. This contradiction is usually interpreted as analogy and we admit that interpretation. Thus although there is only a slight trace in Sanskrit, there might be another example of nasal-liquid alternation.

4. Summary

In Soejima et al.(1990) and this essay we illustrated some examples of nasal-liquid alternations. Finally, we sum up the characteristics of the alternations in table 2.

Notes and References

1) Soejima, A., H. Imagawa and S. Kiritani: Alternation between Stop Nasal and (Nasalized) Flap or Lateral. Ann. Bull. RILP, 24, 131-144, 1990
2) According to Nakagawa, Hiroshi, similar alternations are observed in the adjacent languages such as Ban. Nakagawa, H.: The Tone Classes of Disyllabic Verbs in Ban. (in Japanese): Asian and African Linguistics 19, 27-43, 1990
3) Hyman, Larry M.: The Representation of Nasality in Gokana. in van der Hulst,H. and N. Smith (eds.): The Structure of phonological representations, 111-130, 1982

Table 2

	English	Indic	Sanskrit	Korean	Gokana	Chinese (Minnan)	Chinese (Minbei)	Chinese (others)
phonemicity of the sound alternated into	−	−	+	+	+	+	+	±
phonologican condition for alternation	+	−	−	+	+	+	+	−
opposition between nasals and stops	+	+	+	+	−	−	+	+
nasality in liquids	+	+	−	−	−	+	−	−
parallelism between nasals and stops	+	±	−	−	−	−	−	−