ARE THERE PRENASALISED STOPS IN OCEANIA?

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Nasal plus stop sequences are common in Oceanic languages including many of those spoken in Papua New Guinea. The Buang language, an Austronesian language from the Morobe District (cf. Hooley 1970), is no exception to this. All voiced stops in Buang are preceded by the corresponding homorganic voiced nasals.

In my analysis I treated these sequences as complex unit phonemes rather than as consonant clusters for the following reasons:

(a) Voiced stops never occur in isolation in the language (i.e. apart from the homorganic nasals). This applies also to loan words borrowed from other languages, and the prenasalisation of voiced stops by Buangs speaking other languages is very obvious. They find it impossible to produce b, d... apart from a nasal, until they have considerable training.

(b) There is no clear pattern for consonant clusters elsewhere in the language. Furthermore it does not seem an unreasonable analysis to me, at least for voiced sequences. In most languages voicing of stops usually commences before the stop is released and it seems immaterial to me whether the small amount of air necessary for this voicing is allowed to build up in the mouth until the stop is released or to escape through the nasal cavity thus producing prenasalisation. When I presented this analysis, however, one of my supervisors objected strongly. He had grown up under the school that asserts "once a phoneme, always a phoneme". Therefore if a nasal is a phoneme in one environment, it must be a phoneme in every environment. His analysis equated the voiced prenasalised stops to consonant clusters made up of

nasal plus voiceless stop. This analysis had the advantage that it simplified the phoneme inventory by removing the whole series of voiced stops from the description. Nevertheless, I still felt that I had good reasons for my analysis, supported also by the strong, but unscientific, feeling that I was somehow closer to the "realities" of the language than he was.

His analysis was not merely directed at the particular Buang data but it was a general view of language. At one point in our discussion he commented that he had heard that a number of languages in Oceania had been analysed as having prenasalised stops rather than consonant clusters, but that the linguists concerned obviously just had not fully realised what was happening. My arguments for Buang based on the patterning of the language and the native reaction of Buang speakers he considered trite and irrelevant.

In the end the impasse was resolved as far as my dissertation was concerned by including both analyses with the reasons for choosing my analysis over the one which he thought better. These reasons were those given above plus an attempt to show that my analysis gave a simpler overall description of the phonology even though it did introduce somewhat greater complexity on the phoneme level itself. One additional argument put forward in a footnote suggested that -

> for initial, medial, and final positions, the length in centiseconds of the combination of homorganic nasal plus voiced stop is approximately the same as that of nasals or of voiceless stops. The length of the voiced stops in these combinations is approximately 3-5 centiseconds, much shorter than would be expected for such segments if they were full phonemes. Other phonemes averaged between 10 and 20 centiseconds. - (Hooley 1970 : 132).

In other words I was suggesting that spectrographically the prenasalised stops behaved more like one phoneme than a sequence of two. While the other arguments which I used to justify my position were rather subjective and unproveable, it seemed to me that this last point offered an opportunity for a more objective, scientific approach. It was with this in mind that I had had the spectrograms of sample Buang words made.[1]

To substantiate my argument it was necessary at the very least to have some comparable measurements made for a language which showed contrast between voiced stop and nasal plus voiced stop. English was an obvious example, although in English the contrast is only maintained medially and finally and not initially. I therefore had some samples prepared for English and the measurements made.[2]

The results are given in Table I for Buang and Table II for English, and are plotted comparatively on Graph I. There is a considerable range in duration of the different units due certainly to both experimental error in measurement and to idiosyncratic variation on behalf of the speakers.

The results are nevertheless interesting because the duration of nasals, voiceless stops, fricatives, and nasals plus homorganic stops seems to be roughly comparable for Buang. It should be noted that the data only permitted measurement of final voiceless stops and that the estimate of fricative length was quite different on many of the spectrograms. When the same measurements were made for English, the length of nasal plus homorganic stop was noticeably longer than that of either stop or nasal on their own.

It is perhaps not possible to draw any more significant conclusion than to say that on the limited amount of evidence available it seems that there is support for treating the nasal plus stop sequences in Buang as unit phonemes and not as consonant clusters as they appear to be in English. If this is true for one language it may well be true for other Oceanic languages which have been analysed in this way, and the criticism that earlier analysts had not realized what they were doing was unfounded at least in some cases.

It is necessary to point out, however, that this is a very tentative and cautious conclusion for the following reasons:

(a) Only two languages have been compared, and in one of these the contrast only occurs word medially and finally.

(b) The method of measurement was different for Buang and English, one being via spectrograms and one via the suprasegmentals analyser.

(c) Different people performed the measurements.

In order to confirm the conclusions it would be necessary to carry out more thorough and extensive tests, using the same method of measurement in each case, and preferably with several different languages of each type.

If such tests could demonstrate that the results obtained here are consistently reproducible, it would give us strong experimental basis for analysing sequences of nasals plus stops as consonant clusters in some languages but as complex phonemes in others.

NOTES

1. Mr. R.G. Cochrane of the Department of English at the University of Queensland very kindly ran these spectrograms for me from a tape I sent to him. Two native Buang speakers who knew nothing of the purpose for which it was intended helped me prepare the tape, and Mr. Cochrane estimated the length in centiseconds of the segments concerned.

2. Dr. Charles Peck graciously carried out these measurements for me on his Suprasegmentals Analyser.

REFERENCE

Hooley, Bruce. 1970. Mapos Buang–Territory of New Guinea. Unpublished Ph.D. dissertation, University of Pennsylvania.

TABLE I

BUANG - SPECTROGRAPHIC MEASUREMENT

The numerals indicate length in number of centiseconds.

		SPEAKER I	SPEAKER II
ŋɔp^{h}	/ŋ/-/p/	6 - 16	16
ɡɔp^{h}	/ɡ/-/p/	8 - 22	?
ŋgɔp^{h}	/ŋ/	8	
	-/p/	-- - 17	6
	/g/	2	2
nɔk^{h}	/n/-/k/	8 - 15	19 - 14
lok^{h}	/l/-/k/	9 - 14	4 - 11
^{n}dok^{h}	/n/	10	4
	-/k/	-- - 14	-- - 19
	/d/	3	2
mu	/m/	-- - 11	10 - --
pu	/p/	-- - --	-- - --
vu	/v/	15 - --	10 - 10
^{m}bu	/m/	7 - 6	7 - 6
	/b/	4 - 5	5 - 3
vun	/n/ - /v/	15 - 14	20 - 21
vu^{n}d	/n/	13	8
	- /v/	-- - 13	-- - 15
	/d/	9	7
anaɣ	/n/ - /ɣ/	12 - 15	13 - 19
a^{n}daɣ	/n/	8	8
	- /ɣ/	-- - 23	-- - 18
	/d/	4	4

Table I (continued)

		SPEAKER I	SPEAKER II
me	/m/	16	9
ve	/v/	9	9
^{m}be	/m/	12	7
	/b/	8	5
ɣɔm	/m/ - /ɣ/	22 - 16	18
ɣov	/v/	13	--
ɣo^{m}b	/m/	7	11
	/b/	4	3
nəŋa	/ŋ/	13	14
nəga	/g/	12	9
nəwa	/w/	12	12
nəᵑga	/ŋ/	12	8
	/g/	6	4
saŋ	/ŋ/	20	16
saŋg	/ŋ/	7	11
	/g/	8	6

TABLE II

ENGLISH - SUPRASEGMENTALS ANALYSER

The numerals indicate length in number of centiseconds

Speaker I provided the words in isolation
Speaker II provided the words in the frame:
"This card has [...] on it."

		I	II	I	II		
mad	/m/	9	6	6	8	/n/	want
bad	/b/	7	14	9	2	/t/	
				10	3	/t/	what
	/m/	8	8	7	10	/dž/	jut
amble	/b/	2	2	8	6	/n/	nut
babble	/b/	8	6				
camel	/m/	7	6				
rubble	/b/	4.5	8	9	8	/n/	ranger
rumble	/m/	14	10	5	4	/z/	
	/b/	2	2	12	8	/dž/	wager
pummel	/m/	10	6	3	4	/n/	trainer
cam	/m/	10	6	10	7	/d/	dudgeon
cab	/b/	10	6	8	9	/n/	dungeon
camp	/m/	6	4	4	2	/z/	
	/p/	4	5	10	8	/n/	bunion
cap	/p/	9	8				
not	/n/	-	7	22	7	/n/	range
dot	/d/	-	11	2	4	/ž/	
				8	8	/dž/	rage
winnow	/n/	5	10?	16	6	/n/	rain
window	/n/	9	5	13	8	/ŋ/	anger
	/d/	2	4	2	2	/g/	
widow	/d/	4	4	5	4	/g/	dagger
				9?	10?	/ŋ/	hanger
runner	/n/	6	5	7	6	/g/	figure
rudder	/d/	8	5	8	6	/ŋ/	finger
blunder	/n/	12	8	2	3	/g/	
	/d/	2	3	8?	8?	/ŋ/	singer
wand	/n/	16	8				
	/d/	4	2	5	7	/ŋ/	rink
wad	/d/	6	5	8	5	/k/	
wan	/n/	-	-	9	8?	/ŋ/	ring
				7	6	/g/	rig

Graph I: Type of Consonant