

**Nasal clicks and glottalized clicks with syllabic velar nasals in Jul'hoan\***

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The |Xae|xae dialect of Jul'hoan as it is spoken in western Botswana features a series of nasal clicks and glottalized clicks that are combined with a syllabic velar nasal into a single morphological unit. An acoustic analysis of these clicks suggests that the vowel [a] is not present in the |Xae|xae variants and that only syllabic velar nasal remains. This was found for all four click types with minimal pairs for high and low tones as well as for glottalized clicks and non-glottalized nasal clicks. While their phonetic features appear straightforward, the phonological and orthographic renderings of these clicks are discussed for their wider implications.

**Keywords:** Khoisan, nasal clicks, syllabic nasals, click phonology, click orthography

## **1. Introduction**

The |Xae|xae dialect of Jul'hoan as it is spoken in western Botswana features a series of nasal clicks and glottalized clicks that are combined with a syllabic velar nasal into a single morphological unit. They are possibly contractions of roots containing a vowel [a] and a final velar nasal and transcribed as such in the Namibian dialect of Jul'hoan by Dickens (2005) and Snyman (1975). An acoustic analysis of these clicks suggests that the vowel [a] is not present in the |Xae|xae variants and that only a syllabic velar nasal remains. This was found for all four click types with minimal pairs for high and low tones as well as for glottalized clicks and non-glottalized nasal clicks. While their phonetic features appear straightforward, the phonological and orthographic renderings of these clicks have wider implications.

Three possible renderings are discussed. First, the current orthography of Dickens and Snyman is analyzed in which an underlying vowel and final velar nasal are implied. Second, a sequence of click and syllabic nasal is discussed, suggesting two sounds making one word. Finally, the possibility of a single sound where the syllabic nasal is an integral part of the click articulation is examined. It is argued that in all three cases, the analysis has implications for the understanding of Jul'hoan phonology as well as for the possibilities of click articulations recognized in the Khoisan linguistics literature.

## **2. Nasal and glottalized clicks with a syllabic velar nasal**

During a study of the |Xae|xae dialect of Jul'hoan in Botswana, it was found that for all four click types, there were words that consisted of a click and a syllabic nasal only. This was only found with

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nasal clicks and glottalized clicks. A series of minimal pairs that contrasted in tone and click types was elicited. Productive morphological suffixes, including a plural suffix for a diminutive that consists of a syllabic bilabial nasal, could be attached to these words without interjected vowels of any kind. These words were consistent among over a dozen consultants who were working with the researcher. Only for the word ‘to sneeze’ did one consultant prefer to add a nasalized vowel, i.e., [ĩ], to mimic a sneezing sound. The examples in (1), (2), (3), and (4) provide minimal pairs of glottalized syllabic nasal clicks and syllabic nasal clicks with translations as well as the orthographic rendering following Dickens (2005).

(1)	a.	$!^2\underset{v}{\eta}$	‘blood, money’	<!’áng>
	b.	$^0\underset{v}{\eta}$	‘to sit, sit down’	<n!áng>
	c.	$^0\underset{v}{\eta}$	‘raisin’	<n!àng>
	d.	$^0\underset{v}{\eta}$ (kò)	‘so that’	<n!áng>
(2)	a.	$  ^2\underset{v}{\eta}$	‘to be generous’	<  ’áng>
	b.	$^0  \underset{v}{\eta}$	‘to take’	<n  áng>
	c.	$^0  \underset{v}{\eta}$	‘tuber of morama nut tree’	<n  àng>
(3)	a.	$\#^2\underset{v}{\eta}$	‘to think’	<#’áng>
	b.	$^0\#\underset{v}{\eta}$	‘python’	<n#áng>
	c.	$^0\#\underset{v}{\eta}$	‘to sneeze’	<n#haih>
	d.	$^0\#\underset{v}{\eta}$ (  áò)	‘timber (personal name)’	<n#hàng>
(4)	a.	$!^2\underset{v}{\eta}$	‘to pierce’	<!’áng>
	b.	$^0!\underset{v}{\eta}$	‘stomach, inside, in’	<n!áng>
	c.	$^0!\underset{v}{\eta}$	‘eland’	<n!àng>

As opposed to the Tsum!kwe or Nyae Nyae dialect (see Dickens 1994), most words for animals in the |Xae|xae dialect take a plural suffix (see de Voogt 2022). This dialectal difference across the Botswana-Namibian border allows the syllabic nasal click to be followed by another tone-bearing syllabic nasal:

(5)	a.	$^0!\underset{v}{\eta}$		‘eland’
	b.	$^0!\underset{v}{\eta}$ -má	eland-DIM	‘eland calf’
	c.	$^0!\underset{v}{\eta}$ -rî	eland-DIM-PL	‘eland calves’
	d.	$^0!\underset{v}{\eta}$ -sî	eland-PL	‘elands’

An acoustic analysis of both the nasal click and the glottalized click with the syllabic velar nasal suggests that no vowels were present, although future research using static palatograph or high-speed ultrasound would need to confirm the tongue position and closure. It shows that the nasalization for the nasal click continued throughout the articulation while the nasalization only started after the glottal release in the case of the glottalized click. Spectrograms for three different speakers, two female speakers in their twenties (Figures 1, 2, 5, and 7) and a male speaker in his fifties (Figures 3, 4, 6, and 8), are provided for two click types, and for both nasal clicks and glottalized clicks with a syllabic velar nasal.

Figure 1. Waveform and spectrogram of [l<sup>h</sup>ŋ] ‘blood; money’ elicited in isolation from a female speaker. Labels indicate locations of closure (C), burst (B), and nasalization (N).

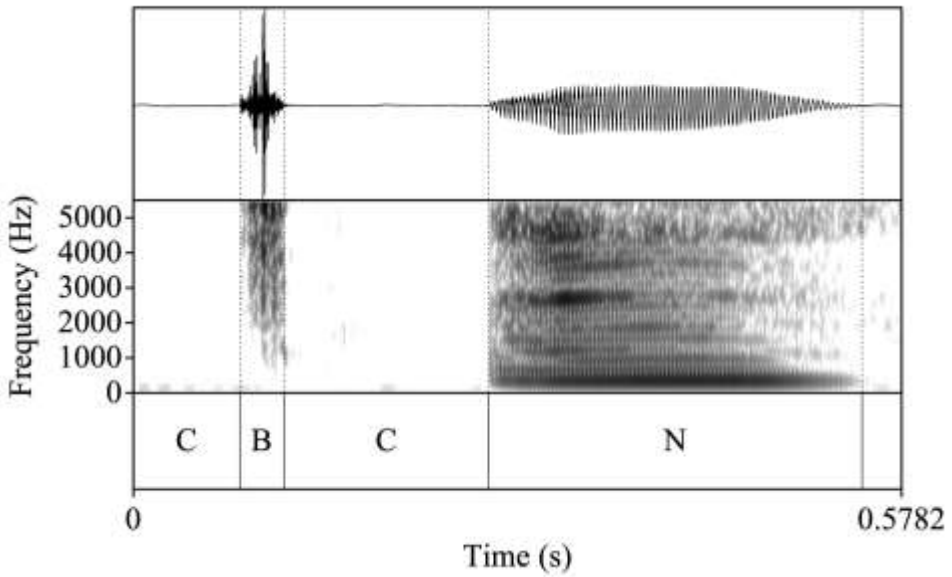


Figure 2. Waveform and spectrogram of [m<sup>h</sup>ŋ] ‘to sit down’ elicited in isolation from a female speaker. Labels indicate locations of closure (C), burst (B), and nasalization (N).

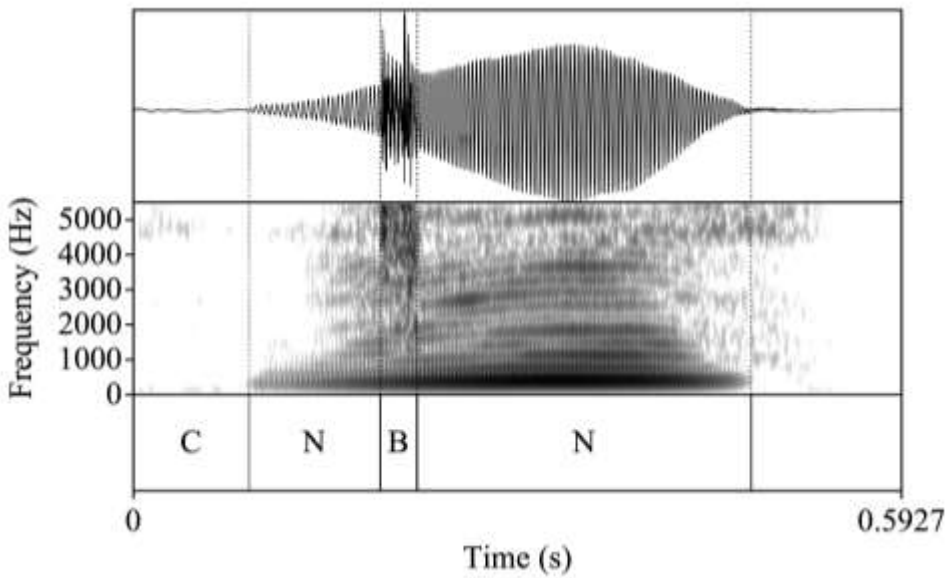


Figure 3. Waveform and spectrogram of [l<sup>2</sup>ɲ] ‘blood; money’ elicited in running speech from a male speaker. Labels indicate locations of closure (C), burst (B), and nasalization (N).

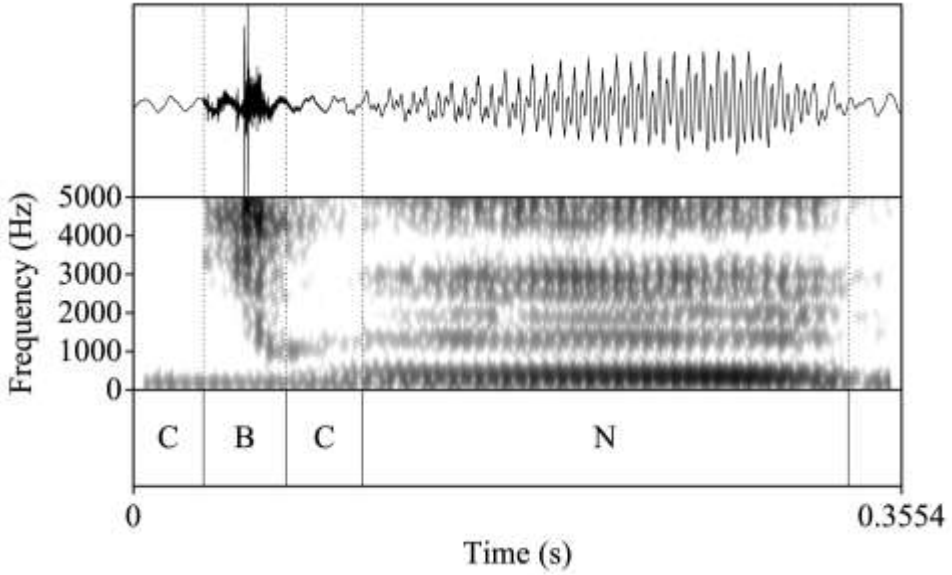


Figure 4. Waveform and spectrogram of [l<sup>0</sup>ɲ] ‘to sit down’ elicited in running speech from a male speaker. Labels indicate locations of closure (C), burst (B), and nasalization (N).

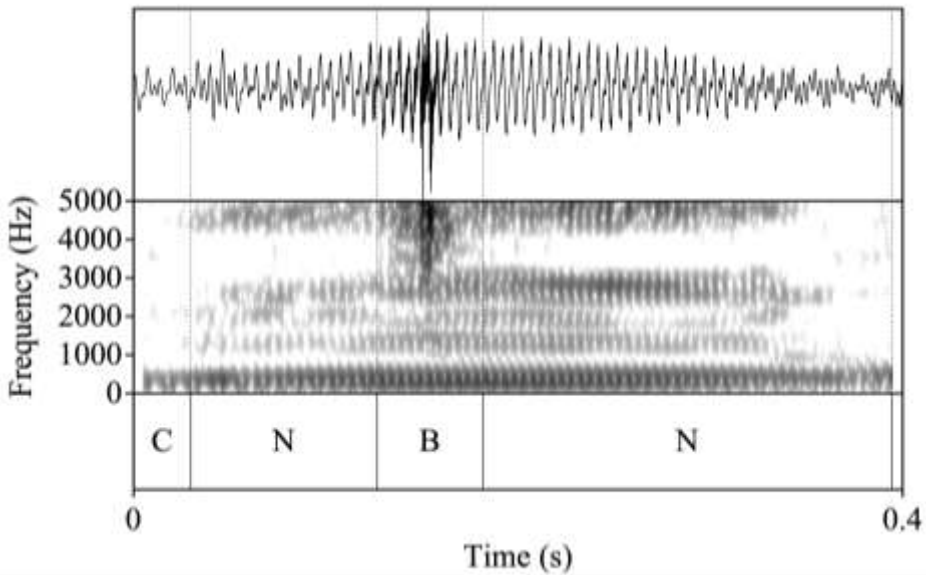


Figure 5. Waveform and spectrogram of [ʈʂ̚ŋ] ‘to think’ elicited in running speech from a second female speaker. Labels indicate locations of closure (C), burst (B) and nasalization (N).

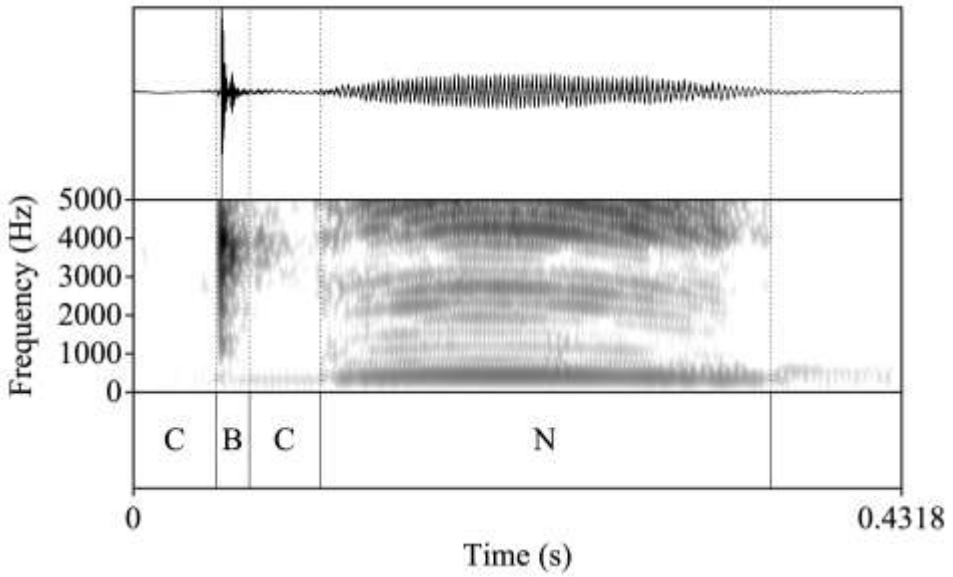


Figure 6. Waveform and spectrogram of [ʈʂ̚ŋ] ‘to think’ elicited in running speech from a male speaker. Labels indicate locations of closure (C), burst (B) and nasalization (N).

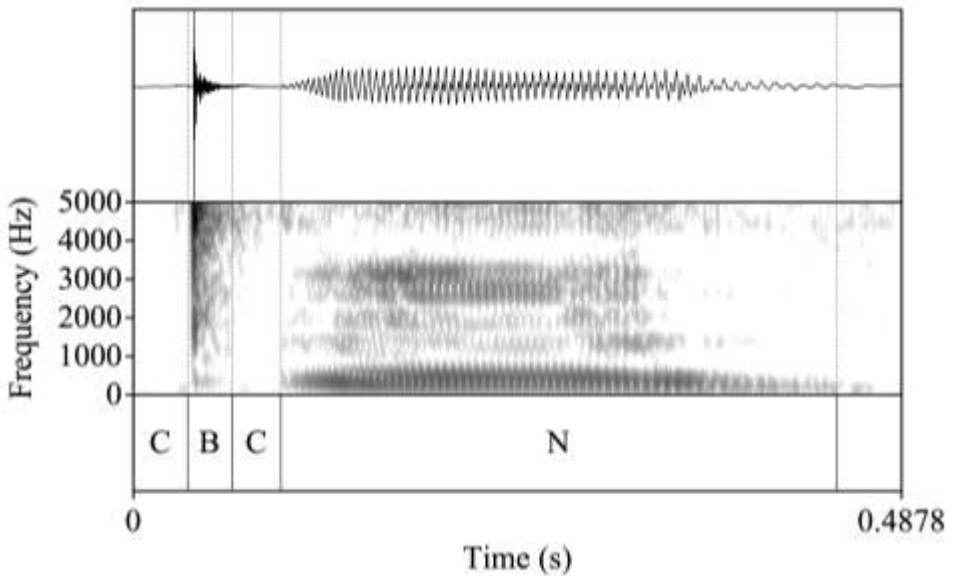


Figure 7. Waveform and spectrogram of [ʰɨŋ] ‘python’ elicited in running speech from a female speaker. Labels indicate locations of closure (C), burst (B) and nasalization (N).

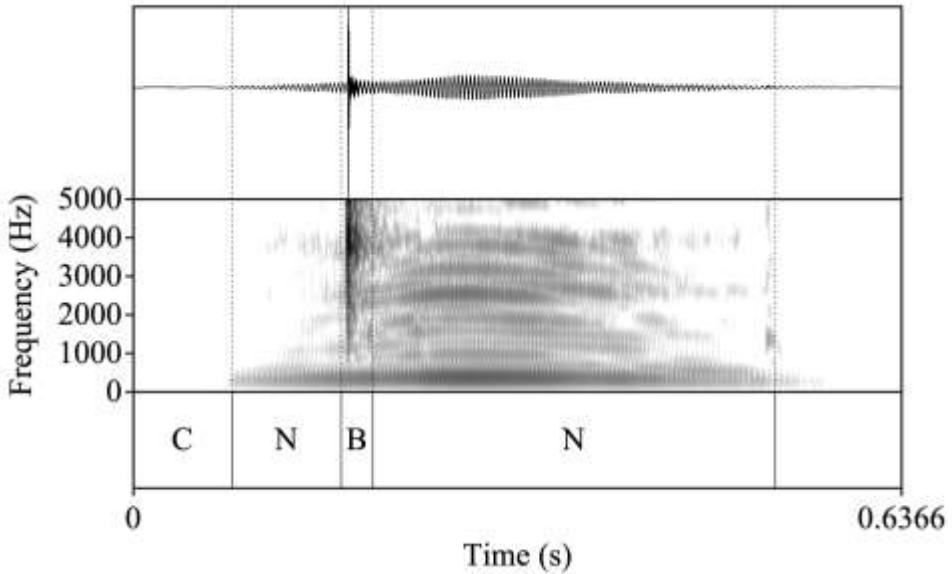
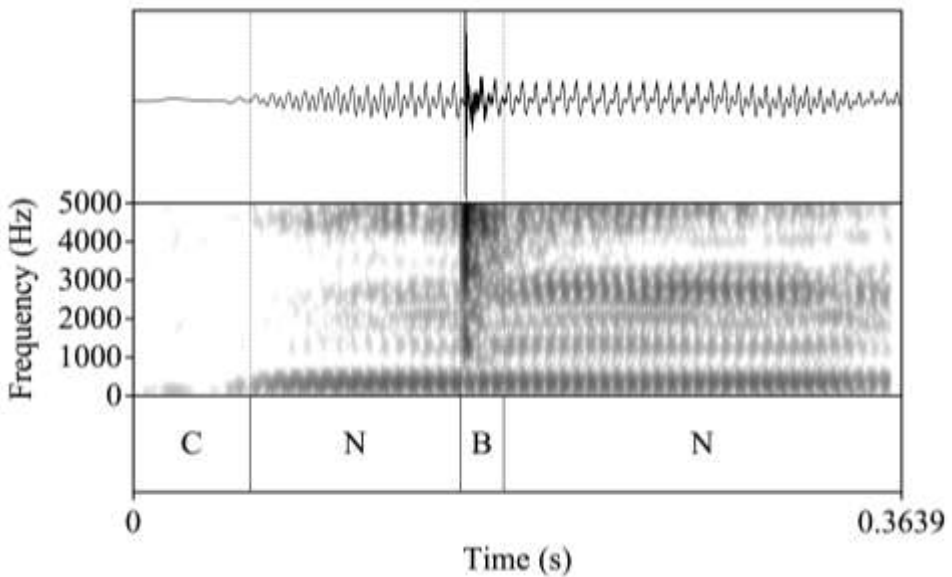


Figure 8. Waveform and spectrogram of [ʰɨŋ] ‘python’ elicited in running speech from a male speaker. Labels indicate locations of closure (C), burst (B) and nasalization (N).



### 3. The orthographic representation by Dickens and Snyman

Snyman (1975:58) distinguished two syllabic nasals, written <m> and <ng>. He notes that <ng> does not occur in word-initial position but <m> does. Also, <ng> only occurs in what he calls the

“Kang-Paradigma”, words ending with an [a] plus <ng>. For <m> three different vowels may precede the final <m>, including [a] and [o] as well as [ʌ]. He considers both syllabic nasals to have vocalic characteristics and analyzes them within the vowel system. Snyman (1975:128) is primarily concerned with phoneme economy or limiting the final number of phonemes after his analysis. He does not state that in the Kang-paradigm the vowel is lost. But in terms of orthographic economy, this would save a symbol while the syllabic nasal becomes a tone-bearing sound, further emphasizing its vocalic character. From Snyman’s account it seems that the contraction of vowel and syllabic nasal has not yet taken place. His analysis, however, makes it an obvious contraction as he already identified the limited Kang-paradigm and the vocalic character of the syllabic nasal. With few exceptions (cf. Westphal 1971:16–17), vowel reduction in click languages tends to be ignored. Even though Snyman spells these syllables with a phonemic /a/, there should be no expectation of a phonetic [a].

Dickens submitted his dictionary for publication in 1992 and states (1994:10) that the syllabic velar nasal is written as <ang> and the syllabic bilabial nasal <mm> with variations taking into account glottalization and aspiration. There is no explanation or elaboration on why this orthographic representation is preferred. Dickens’ orthography allows the use of a regular keyboard to write all sounds of the Jul’hoan language; tone-marking on nasals would defeat that principle and may explain the spelling <ang> and orthographic economy may have prevented the spelling <ngng>, which could have been in parallel with <mm>.

If we assume a diachronic change, it would provide insight into how the current articulations were formed and how they should be analyzed phonologically. A contraction of a vowel and a final velar nasal to a syllabic velar nasal is not a problematic scenario. On the other hand, if it is not a diachronic change but an interpretation then the notation is somewhat misleading.

Writing the possible historic [a] for the |Xae|xae dialect does not add insight or convenience. There is no contrast with other vowels and the vowel is not audible. The alternative does require tonal notation on the syllabic nasal but Dickens (2005) already showed that a more limited tonal notation is hardly problematic, so he does not include it for the syllabic bilabial nasal that is, for instance, featured as a diminutive suffix in his grammar.

#### 4. A phonological representation following the phonetic realization

If we follow the phonetic realization, it is possible to postulate a syllabic nasal click. So far, descriptions of N|uu and Jul’hoan, for instance, have favored a phonological analysis of a nasal click followed by a syllabic velar nasal (Miller et al. 2009, Miller-Ockhuizen 2013). The possibility of a syllabic nasal click is generally ignored.

Nasalization may precede a click burst, continue with a click burst, and/or continue after a click burst. In the case of glottalized clicks with a syllabic nasal, there is a separation between the click burst and the nasalization. In the case of nasal clicks, there is none as the nasalization is continuous. Both have been analyzed, phonologically, as click + syllabic velar nasal.

If we have nasalization only preceding the click burst, then the click burst, if it is syllabic, still needs an accompaniment. A syllabic nasal click, by definition, needs nasalization throughout the click burst. If we consider the time that the syllabic velar nasal is taking compared to a click burst, even with preceding nasalization, it would not be unreasonable to find nasalization after the click burst if it were a syllabic nasal click.

Finally, if we consider the sequence /<sup>0</sup>!ŋ̣-ŋ̣/ ‘eland calfs’, the velar nasal click with syllabic velar nasal is followed by a syllabic bilabial nasal. Phonetically, this is impossible to distinguish

from a syllabic nasal click followed by a syllabic bilabial nasal /<sup>h</sup>!ᵑ-ᵑ/ unless the syllabic velar nasal is audibly separated from the nasal click as in glottalized clicks followed by a syllabic velar nasal.

It is concluded that in Jul'hoan the difference between, for instance, /<sup>h</sup>!ᵑ/ or a click followed by a syllabic nasal and /<sup>h</sup>!ᵑ/ or a syllabic nasal click, is only one of phonology and not of phonetics, while it is noted that the click is not tone-bearing, only its nasalization is. Syllabic nasal clicks may, therefore, assist in future phonemic analyses but, most of all, they suggest an orthographic representation that is less deceptive.

### Abbreviations

DIM diminutive

PL plural

### References

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