

Some unusual sounds in Changana

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Abstract

A selection of typologically unusual or possibly unique sounds in Changana are briefly described, including the unaspirated and aspirated versions of /t/ and /pʃ/ as well as voiced and aspirated prenasalised affricates such as /ndʒʰ/. It is also shown that prenasalisation occurs with implosives as well as with voiced, voiceless unaspirated, and voiceless aspirated stops.

1 Introduction

Changana (also called Tsonga) is a Bantu language spoken by about three million people, primarily in Mozambique and South Africa. It has an exceptionally large consonant inventory with approximately 125 contrastive elements (see Janson, forthcoming, for a phonological survey). The purpose of this paper is to provide a preliminary phonetic documentation of how aspiration and prenasalisation are manifested in some unusual sounds. The data are based on field recordings (carried out by Karl Erland Gadelii) with two male speakers of a Mozambiquean variety of the language. Each speaker read isolated words from a list. Each word was produced once, but many consonant types are exemplified by several words.

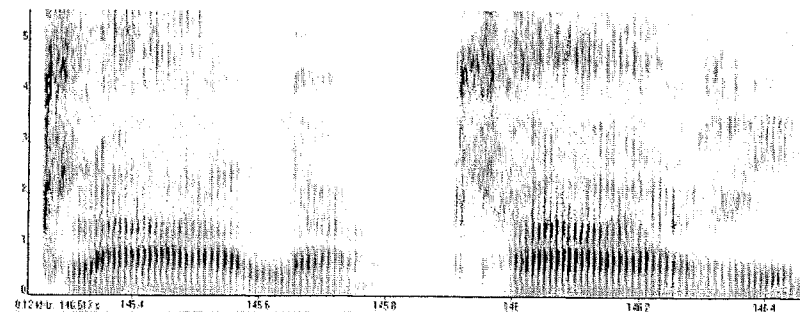
2 Aspiration

The series of voiceless unaspirated stops includes /p t k/. Each of these also has an aspirated and a voiced cognate. The contrast between unaspirated and aspirated stops is acoustically manifested mainly as a difference in VOT, just like in many other languages.

However, there are also several other sounds that have aspirated and voiced counterparts. Three unusual ones are chosen here. The first is /tʃ/, a dental stop with lateral release according to most descriptions. However, it has also been seen as a special type of affricate, which is the standard description for the very similar sound in Zulu, another Bantu language spoken in an area adjacent to that of Changana.

The spectrograms in Figure 1 show the words *tlala* 'cyst' and *tlhari* 'spear'. The lateral segment is partly voiced in the former word, while it is completely voiceless in the latter. The latter thus displays a longer fricative interval than the former but, phonetically speaking, it is fricative rather than aspirated; VOT is approximately 45 and 95 ms, respectively. Perhaps because of the lateral noise component, both stops are easily heard as palatal.

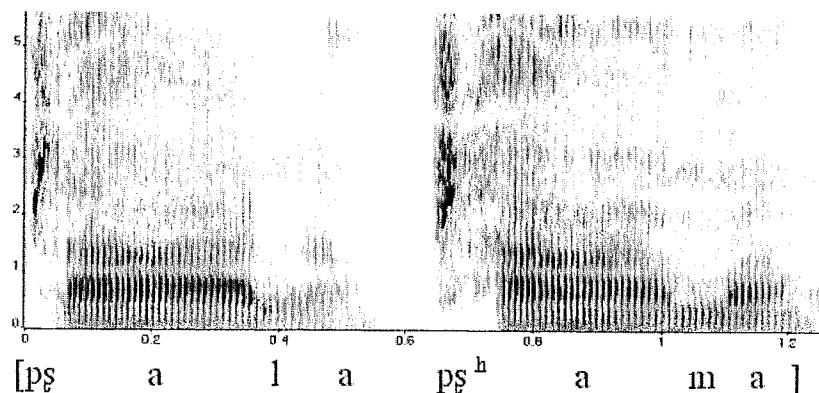
The second sound, that is not easy to categorise either, is /pʃ/ and its voiced and aspirated counterparts. Historically these sounds have developed from palatalised labial stops such as /pʲ/. Phonologically it seems clear that they function as single segments, and they are usually called affricates. However, the phonetic definition of affricates normally includes homorganic pronunciation of the stop and the fricative portions of the sound, and that obviously is not the case here.



[t l a l a tʃʰ a r i]

Figure 1. Spectrogram of the words *tlala* 'cyst' and *tlhari* 'spear' illustrating unaspirated /t/ and aspirated /tʃʰ/ in initial position.

In Figure 2, spectrograms of the words *psala* 'give birth to' and *pshama* 'lose flavour' illustrate the contrast. It is clear that the fricative portions of the respective sounds are fairly equal in duration, while the affricate in *pshama* also contains a marked aspirative noise of about 70 ms.



[pʃ a l a pʃʰ a m a]

Figure 2. Illustration of aspirated and unaspirated affricates in *psala* 'give birth to' and *pshama* 'lose flavour'.

The third sound to be discussed is clearly an affricate, but a most unusual one. We first note that the language has prenasalised voiced aspirated stops. A remarkable fact about these sounds is the lack of the corresponding voiced aspirated, *non-prenasalised* stops. This seems to run counter to the typologically more common situation where a complex series usually implies a less complex cognate series. For further data and discussion pertaining to this phenomenon, see Janson (1999).

There is also a series of corresponding affricates, not discussed in that paper. The same pattern is observed for them. There is, for example, a prenasalised and aspirated voiced affricate /nbv^h/, but the non-prenasalised cognate /bv^h/ does not exist.

An example of the unaspirated vs. aspirated contrast for voiced prenasalised affricates is given in Figure 3. The spectrograms show, from left to right, the words *njangu* 'house' and *njhani* 'how?'. The 'aspiration' in the latter word manifests itself as a 'murmured' or 'breathy' voice quality. The effect on F₂ and higher formants is clearly seen some 50 ms into the vowel as indicated by the superscript [h]. This extra phonation gesture increases the duration of the vowel relative to the duration of the vowel following the unaspirated affricate (approximately 350 vs. 270 ms, respectively).

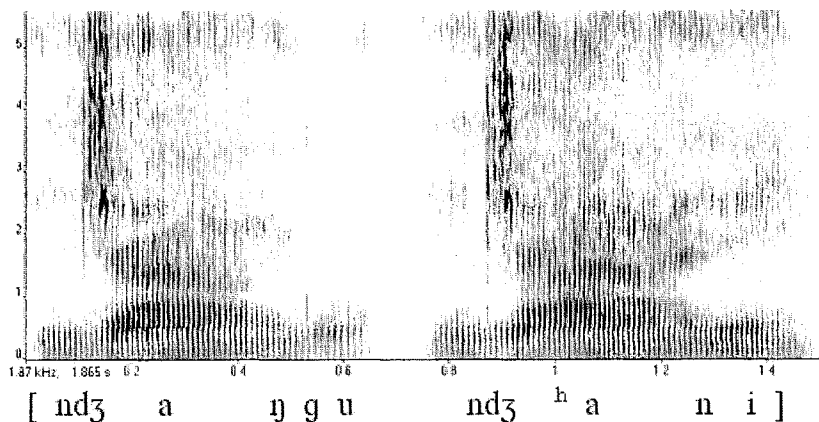


Figure 3. Spectrograms of the words *njangu* 'house' and *njhani* 'how?'.

3 Prenasalisation

Prenasalisation, which was present in the previous example, is a pervasive process in the language. It quite often occurs word-initially but is also found within words. Not only all stops and affricates, but also fricatives and even liquids may be prenasalised. Phonologically, the prenasalisation is usually regarded as a feature of the following consonant. The reason is that the syllabic pattern of the language is regarded as strictly CV; no consonant clusters are allowed. Phonetically, however, the nasal portions are sometimes long and rather strongly pronounced, so that they are within the range of ordinary nasal consonants.

The alveolars and the velars can combine prenasalisation and labialisation. Figure 4 represents the word *nkwahle* 'leguan' (which also illustrates the voiceless lateral [ɬ] denoted *hl* in Changana orthography). Labialisation is indicated by the low F₂ at the beginning of the vowel. Also note that the prenasalisation interval is quite brief in this case (about 55 ms). In these recordings, this interval displays highly variable durations. This variability apparently affects the non-native listener's impression of syllabicity such that only prenasalisation durations in the longer range tend to be heard as syllabic.

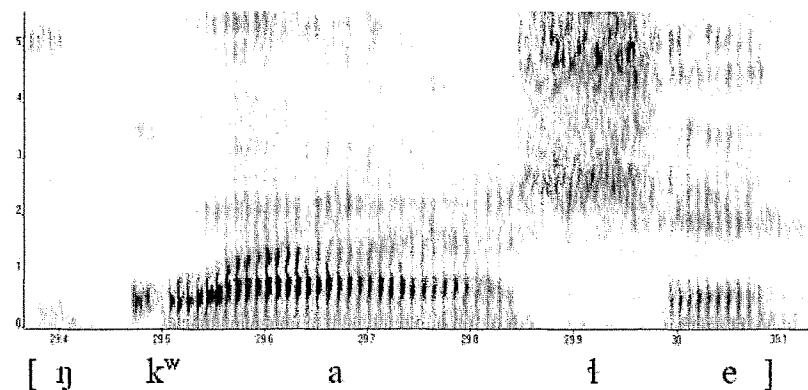


Figure 4. Spectrogram of the word *nkwahle* 'leguan'. Note low F₂ as an index of labialisation and the relatively weak prenasalisation.

The language exhibits a very large number of contrastive prenasalised segments. As a further example, Figure 5 shows prenasalisation with implosive, voiced, voiceless unaspirated and voiceless aspirated stops. This appears to be a typologically unusual repertoire of prenasalised stop types (cf. Ladefoged and Maddieson 1996, pp. 123 ff.). Note the increasing amplitude of the voice pulses associated with the implosive and the brevity of the stop closure interval in the non-implosive case (second from left).

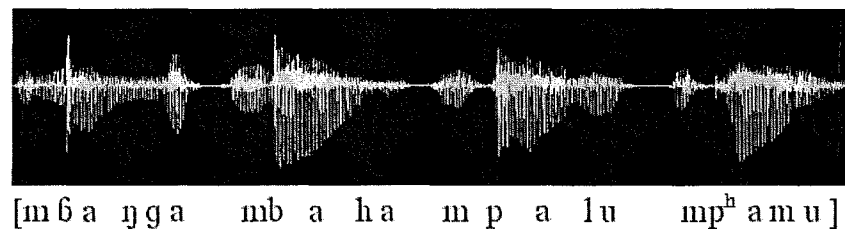


Figure 5. Prenasalisation with implosive, voiced, voiceless unaspirated and voiceless aspirated stops.

References

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