**On the acoustics and articulation of the affricates of Northern Tosk Albanian**

(general session)

In this paper, we provide a descriptive account of the affricate consonants of Northern Tosk Albanian on the basis of newly-collected preliminary acoustic and articulatory data. Our goal is to determine whether ⟨q⟩ and ⟨gj⟩ are plosives or affricates and to ascertain the place of articulation of these consonants as there is disagreement in the literature on these points.

Albanian forms an isolate branch of the Indo-European language family (Çabej 1976) and comprises two main varieties, Gheg and Tosk, as well as regional sub-varieties such as Northern Tosk (Gjinari 1988; Gjinari et al. 2007). Its phonological system has traditionally been described as including two pairs of affricates, /ts dz/ and /tʃ dʒ/, exemplified in (1) below (Beci 2004).

(1) a. ⟨c⟩ /ts/ *cica* /tsitsa/ 'boobs'
b. ⟨x⟩ /dz/ *xixa* /dzidza/ 'sparkles'
c. ⟨ç⟩ /tʃ/ *çaji* /tʃaji/ 'tea'
d. ⟨xh⟩ /dʒ/ *xhaja* /dʒaja/ 'uncle'

However, there is disagreement and uncertainty in the literature regarding the additional pair of consonants written ⟨q⟩ and ⟨gj⟩, examples of which can be seen in (2) (Beci 2004).

(2) a. ⟨q⟩ *qava* 'cried'
b. ⟨gj⟩ *gjaku* 'blood'

Several authors classify these segments as plosives (Bevington 1971; Newmark et al. 1982; Dodi 1996; Memushaj 2005, 2011; Jubani-Bengu 2011, 2012) whereas Lowman (1932) suggests they are affricates and this is more recently corroborated by Belluscio (2014) who notes that they tend to be strongly affricated. With respect to place of articulation, ⟨q⟩ and ⟨gj⟩ have been described variously as palatal, pre-/alveolo-palatal and lamino-post-alveolar consonants (Lowman 1932; Bevington 1971; Newmark et al. 1982; Dodi 1996; Kolgjini 2004; Memushaj 2005, 2011; Jubani-Bengu 2011, 2012; Belluscio 2014).

In our study, we recorded five native speakers of Northern Tosk (3F, 2M; aged 25–33) reading a word list, sentence list and short story. Among the stimuli were the examples given in (1, 2) and words beginning with additional lingual consonants, e.g. /t d s z ʃ ʒ/. The affricates were impressionistically coded by three analysts and the presence or absence of frication in the spectra of ⟨q⟩ and ⟨gj⟩ was visually assessed. Spectral moments were also calculated within all fricated portions identified. In addition to these acoustic-based data, we also collected static palatographic data from another native speaker of Northern Tosk (F, 41) who was asked to produce nonce-words in which the target consonants were flanked by low vowels, e.g. /atsa/.

Both the visual inspection of the spectrograms and phonetic transcriptions of the three analysts indicate that ⟨q⟩ and ⟨gj⟩ are affricates rather than plosives. Figure 1 offers examples of the substantial fricated portion observed for all speakers for both of these consonants. Figure 2 shows that the place of articulation of ⟨q⟩ and ⟨gj⟩ is post-alveolar and virtually identical to that of /tʃ dʒ/. However, the former were produced with greater tongue contact than the latter, suggesting they are lamino-post-alveolar affricates (see e.g. Ladefoged & Maddieson 1996), i.e. /t̪ʃ̪ d̪ʒ̪/, and contrast with apico-post-alveolar /tʃ dʒ/. This description is also consistent with spectral-moment analysis, such as the centre-of-gravity values which can be seen in Figure 3.

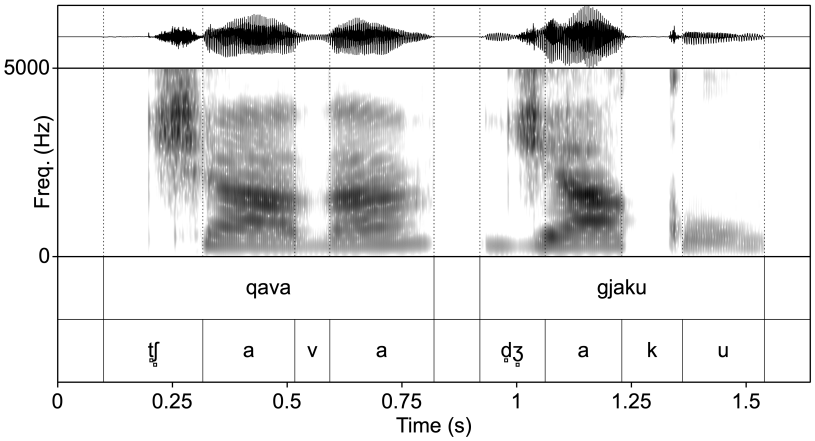
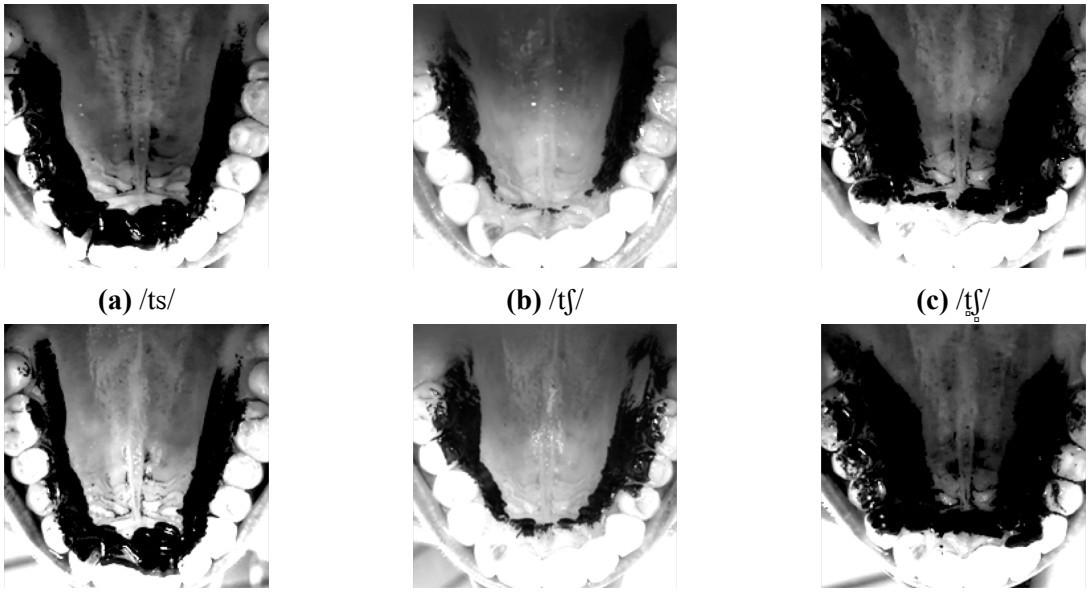



**Figure 1:** Example waveforms and spectrograms of *qava* 'cried' and *gjaku* 'blood'



**(a)** /ts/ **(b)** /tʃ/ **(c)** /ʈʂ/

**(d)** /dz/ **(e)** /dʒ/ **(f)** /ɖʒ/

**Figure 2:** Palatograms of affricates (black indicates areas of contact between tongue and palate)

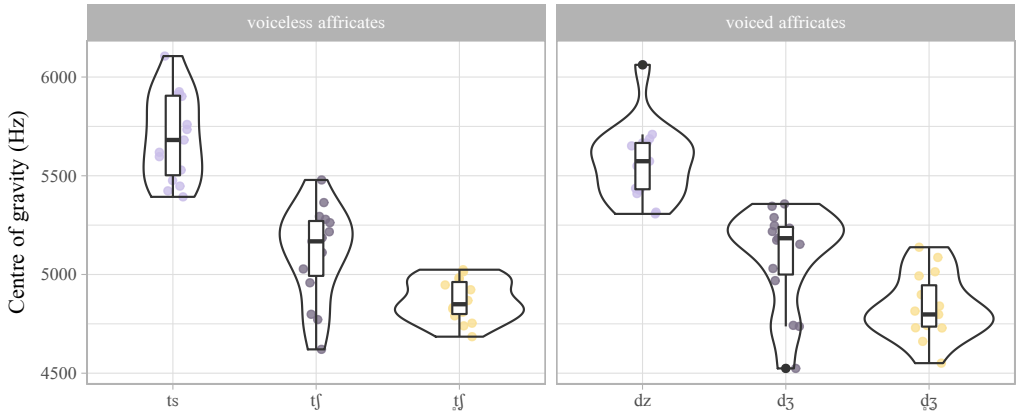



**Figure 3:** Spectral centre of gravity of affricates