ARTICULATORY CHARACTERISTICS OF ANTERIOR CLICK CLOSURES IN N|UU

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ABSTRACT

We document the anterior places of articulation in the N|uu click types [|, !, ǁ, ǂ] using palatography and linguography. We discuss the variability seen across speakers and compare these articulations with the cross-linguistic variation reported for comparable clicks. We show that inter-speaker variability found for anterior click place of articulation is comparable to that found for coronal pulmonic consonants.

Keywords: clicks, palatography, Khoisan, Khoesan, coronals

1. INTRODUCTION

Like other segments, clicks represented with a single given symbol can differ somewhat in their production, both within and across languages. Ladefoged and Maddieson [1] state that no known language contrasts more than five click types, and that these types can be represented with the symbols [ʘ, |, !, ǁ, ǂ]. The goal of this paper is to document the anterior articulations of the four coronal clicks in N|uu and to place our findings in the context of known cross-linguistic variation found within clicks.

N|uu, also known as ǂKhomani, is spoken by about ten people in South Africa and Botswana. It is the sole remaining member of the !Ui branch of the Tuu family (formerly called Southern Khoisan). Like the better-known Tuu language !Xóõ (Taa branch), N|uu contrasts five different types of clicks [2]. We investigate the anterior places of articulation in the four coronal click types [|, !, ǁ, ǂ] by comparing palatograms and linguograms from five N|uu elders, all of whom requested recognition for their contribution to our study: Ouma Anna Kassie (AK), Ouma Hanna Koper (JK), Ouma Griet Seekoei (GS) and Ouma Katrina Esau (KE), who speak the Western dialect of the language, and Oupa Andries Olyn (AO), who speaks the Eastern dialect. All are bilingual in Afrikaans and N|uu and are over 65 years of age.

Sets of 2-4 palatograms and linguograms per click type were collected from each of the five speakers using the methods described in [3]. We provide representative photographs that have been oriented so that the back of the mouth is at the top, and the front of the mouth at the bottom of each image.

2. THE DENTAL CLICK

The N|uu dental click type [|] is best characterized as a laminal dental segment that involves both the tip and the blade of the tongue. Ladefoged and Maddieson [1] claim that this is the typical articulation of this click type cross-linguistically. We have no evidence to support Doke's [4] description of an apical dental click in N|uu.

Figure 1: Linguogram of the N|uu dental click type in the word [|aa] 'hold' (speaker GS).

Figures 1 and 2 show that the area of contact for the dental click is fairly broad. The front teeth are obscured in Figure 2 by the speaker's lip, but contact extends from the back of the front teeth to the alveolar ridge. It is clear from the photos that this speaker is using the tip and the blade of her

tongue to form the contact on the roof of her mouth near her front teeth.

Figure 2: Palatogram of the N|uu dental click type in the word [|aa] 'hold' (speaker GS).

There are variant productions of this click for the speakers who lack upper teeth to brace the tongue against: Speaker AO makes anterior contact with the body of his tongue in the dental area (the tip and blade are braced behind his lower gums), and Speaker JK makes an apical post-alveolar constriction. The fact that the auditory impression of the clicks produced by these speakers is recognizably "dental", despite the lack of front teeth, shows that click production is more flexible than one might expect of such aerodynamically complex segments.

3. THE CENTRAL ALVEOLAR CLICK

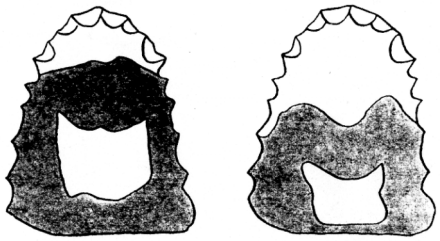
The linguogram and palatogram for the central alveolar click [!] are shown in Figures 3 and 4. Doke [4] says this click is made with the "tongue-tip placed firmly on the point of division between palate and alveolus", and this is largely consistent with our findings. In general, this segment is best characterized as an apical alveolar. We can see in the photographs that contact is narrower than in the dental click, and that it is made with the tongue apex along the alveolar ridge and with no contact between the tongue tip and the back of the upper front teeth. This is true of speakers GS, KE, AO and AK, but speaker JK makes a laminal articulation in the alveolar/post-alveolar region.

Figure 3 shows that speaker GS uses the tip of her tongue in producing the [!] click. Figure 4 shows that contact is on the alveolar ridge, with no contact between the tongue tip and the back of the upper front teeth.

Figure 3: Linguogram of the N|uu central alveolar click type in the word [!aa] 'hartebeest' (speaker GS).

Figure 4: Palatogram of the N|uu central alveolar click type in the word [!aa] 'hartebeest' (speaker GS).

Figure 5: Palatograms of the post-alveolar click type in isiXhosa as recorded by Beach [5]. The teeth are at the top of the image.



In N|uu, [!] is an alveolar click produced with contact further forward than is reported for the post-alveolar click (also transcribed [!]) found in languages like isiXhosa [5], as shown in Figure 5. In this type of click, contact extends well behind the post-alveolar region. The N|uu click is acoustically and articulatorily similar to the [!] in Hadza [6], and less similar to the more typically retracted [!] clicks we hear in Ju|'hoansi, Khoekhoe, isiZulu and isiXhosa. This is in keeping with differences found in the acoustic burst spectra of N|uu [7] and isiXhosa [8, 9] clicks. The !Xóõ [!] click varies between alveolar and post-alveolar articulations [10]. While no language contrasts

alveolar and post-alveolar clicks, it is important to note that the symbol [!] is ambiguous and should be interpreted with caution.

4. THE LATERAL ALVEOLAR CLICK

Figure 6: Linguogram of the N|uu lateral alveolar click type in the word [ᵍǁaa] 'night' (speaker GS).

Figure 7: Palatogram of the N|uu lateral alveolar click type in the word [ᵍǁaa] 'night' (speaker GS).

Anterior constrictions in lateral clicks [ǁ] have been reported to range from denti-alveolar to alveolar to post-alveolar in different languages. Figure 7 shows that the place of articulation in the N|uu lateral click is alveolar. This is consistent with Doke's [4] description of [ǁ] having contact between the "upper-part of tongue-tip" and the alveolus (i.e. the alveolar ridge). Differences have also been reported as to whether the lateral release is more to the front or back, and whether the constriction is apical, apico-laminal or laminal. Unfortunately, static palatography cannot provide us with evidence for the location of the lateral release, and it is difficult to characterize the N|uu lateral click as either apical or laminal, in part because the anterior contact patterns vary across speakers: JK has consistently laminal articulations, as does GS in the photo in Figure 6, while KE's are consistently apical. Generally, [ǁ] contact patterns are broader than those for [!], yet less broad than those for [|].

5. THE "PALATAL" CLICK

The IPA term for the [ǂ] click is "palatoalveolar", but the more common term for this click among Khoesanists is "palatal" [1, 10-12]. The photographs in Figures 8-10 show that this click is produced with a very long laminal anterior constriction from at, or just behind, the upper front teeth to the post-post-alveolar, or pre-palatal region, and that the lingual contact is even broader than that seen with the dental click in Figure 1.

Figure 8: Linguogram of the N|uu palatal click type in the word [ǂa] 'someone' (speaker KE).

The broad contact pattern is likely due to the sliding of the tongue from a laminal dental to a laminal palato-alveolar location during the production of the click. Unfortunately, static palatography cannot provide information about the dynamic properties of the anterior release [1], and it is only the point of contact just prior to the release that determines the click burst's spectral properties. EPG data from a single Khoekhoe speaker [11] shows that there is extreme movement in the anterior constriction during this click, with a laminal post-alveolar, and not a broad denti-post-alveolar contact just before the anterior release. Similar dynamic investigation would be needed to fully document the articulation of this click type in N|uu, but we expect that it may also be best characterized as laminal post-alveolar at the time of the anterior release.

Figure 9: Linguogram (somewhat blurry) of the N|uu palatal click type in the word [ǂɑɑ^{ʔn}] 'street between the dunes' (speaker GS).

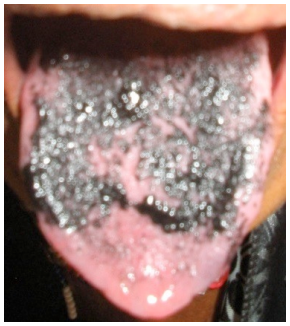


Figure 10: Palatogram of the N|uu palatal click type in the word [ǂɑɑ^{ʔn}] 'street between the dunes' (speaker GS).

The "palatal" click [ǂ] is made with apico-laminal contact in Khoekhoe [5, 11] but without apical contact in G|ui [11] and N|uu. Doke [4] says the [ǂ] click in N|uu is made with the "upper part of the tongue behind the tip pressed firmly against the gum ridge behind the central upper teeth", which is an independent confirmation of our observation that it is made without apical contact.

6. CONCLUSION

The anterior constrictions in the four N|uu coronal click types can be described as: [ǀ] laminal dental, [ǃ] apical central alveolar, [ǁ] apical or laminal lateral alveolar and [ǂ] laminal post-alveolar. Considerable variability with respect to the articulatory descriptions and classifications of different clicks cross-linguistically has been documented [1, 10-12] which is comparable to that seen for coronal pulmonic consonants. We presented data from N|uu showing the patterns of articulation, and presented the first description of variation in click articulation due to differences in dentition.

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