The representation of Taa clicks: a Government Phonology analysis

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Clicks are stops, produced by an anterior and a posterior constriction, via rarefaction of air between the two closures, resulting in an ingressive lingual (or velaric) airstream mechanism, when the forward closure is released. They can thus be represented either as simple stops with a distinctive airstream (Anderson & Ewen 1987, Miller *et al* 2009), or as complex segments defined by the double closure (van de Weijer 1994). In this talk, I propose an analysis of the latter type, employing Element Theory (Harris 1994). I show that the existence of clusters in languages like Taa follows naturally from this approach.

Data. (1) presents the consonant system of Taa (Naumann 2009, Bradfield 2012).

(1)	egressive			ingressive (clicks)					egressive			
	lab	dent	alv	lab	dent	alv	pal	lat	vel	uvu	uv aff	glott
plain	p	t	ts	ʘ	ǀ	ǃ	ǂ	ǁ	k	q		ʔ
voiced	b	d	ʣ	ᵍʘ	ᵍǀ	ᵍǃ	ᵍǂ	ᵍǁ	g	ɢ		
vls aspir.	pʰ	tʰ	tsʰ	ʘʰ	ǀʰ	ǃʰ	ǂʰ	ǁʰ	kʰ	qʰ		
vd aspir.	bʰ	dʰ	ʣʰ	ᵍʘʰ	ᵍǀʰ	ᵍǃʰ	ᵍǂʰ	ᵍǁʰ	gʰ	ɢʰ		
vls ejective	p’	t’	ts’		ǀ’	ǃ’	ǂ’	ǁ’	k’	q’	qχ’	
vd ejective			ʣ’		ᵍǀ’	ᵍǃ’	ᵍǂ’	ᵍǁ’	g’	ɢ’	ɢʁ’	
nasal	m	n	ɲ	ᵑʘ	ᵑǀ	ᵑǃ	ᵑǂ	ᵑǁ	ŋ			
vls nasal					ᵑʰǀ	ᵑʰǃ	ᵑʰǂ	ᵑʰǁ				
glott. nasal	ˀm	ˀn		ˀᵑʘ	ˀᵑǀ	ˀᵑǃ	ˀᵑǂ	ˀᵑǁ				
fricative	f	s								χ		h
approxim.	w	r l	j									

Initial clusters: CC, and C + χ, qχ’.

Clicks are generally described in terms of the click type (place of the anterior constriction) and the accompaniment (properties of the posterior constriction, laryngeal and nasal settings of the click). The posterior constriction is mostly uvular and often very weak. Clicks are integrated into a unified system with egressive stops in (1), because they share the same phonological series (plain, voiced, etc.), shown in the rows. The lexical stem in Taa conforms to the shape C(C)V(C)V or C(C)VN. Most consonants (clusters included) are confined to stem-initial position.

Previous accounts. Traditionally, all consonants in (1), including those now analysed as clusters, have been treated as unitary segments in descriptions of Khoesan languages. This resulted in even larger inventories than the 87 consonants in (1) (by the addition of 77 clusters, or rather, in that view, very complex segments). Also, the second member of such sequences always exists as an independent consonant in the language (shown in red), and changes affecting one extend to the other, which is seen as pure accident in a unitary analysis. Acoustically, clusters are characterised by two audible release bursts, whereas in single clicks the posterior release is masked by the anterior burst. Finally, clusters generally have a longer duration than single consonants, also left unexplained by the unitary segment analysis.

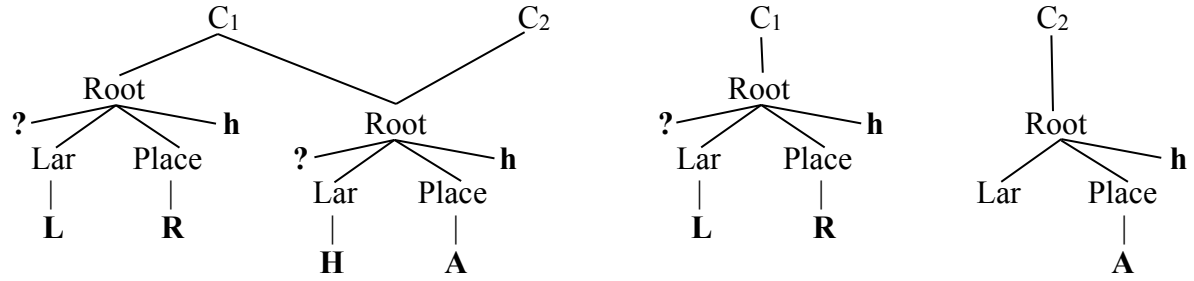
On the other hand, the clusters shown in (1) are rather peculiar. They are all obstruent clusters, and obstruent–sonorant clusters resembling branching onsets in other languages are non-existent in Taa (Miller 2011). However, the clusters in (1) are not random, and the restrictions provide support for a complex segment analysis of clicks.

Analysis. Clusters in Taa are either built up by a plain (voiceless) or voiced click followed by a voiceless uvular (or glottal) egressive obstruent, or by a plain or voiced coronal egressive stop or affricate followed by a uvular fricative or affricate. C_2 in such clusters, being usually uvular, corresponds to a possible posterior constriction in a click, whereas C_1 is either itself a simple click or it corresponds to a possible anterior constriction in a click. Therefore, such clusters can be analysed as (complex) clicks broken into their constituent parts, realised

sequentially, instead of (near) simultaneously, under separate skeletal slots. (For a rudimentary formulation of this idea, see Traill 1993.) These clusters thus resemble diphthongs or affricates, as compared to monophthongs or plosives.

This idea can be easily implemented in a framework like Government Phonology, employing independently interpretable privative elements, if clicks are represented as complex segments involving two closures. (Interpretation of elements: **?** 'closure', **h** 'noise', **L** 'voice', **H** 'aspiration', **R** 'coronal', **A** 'uvular'. Released stops contain both **?** and **h**.) A click, like [^{g}|^{h}], has then two root nodes (as C_1 in (2a), without the link to C_2), the anterior closure represented under one of the root nodes, and the posterior closure under the other. In a cluster like [^{g}|q^{h}], the posterior closure is extended, by sharing its root node with the following skeletal slot, C_2, as in (2a).

(2) (a) [^{g}|q^{h}] (b) [dχ]



Laryngeal elements occur only once in a complex segment: **L** 'voice' can only be linked to the anterior root node, while other laryngeal distinctions are made under the posterior root node. Evidence for this (apart from phonetics) is provided by clusters, where voicing appears as prevoicing to the onset, whereas aspiration (or ejection) follows the posterior burst. A cluster like [^{g}|h] would differ from (2a) only in that in this case it is not the whole posterior root node that is shared by C_2, but only the element **h** under it (interpreted as the fricative [h] when standing alone). In a cluster like [dχ] in (2b), the anterior and posterior root nodes of the corresponding simple click [^{g}|] are completely separated, and the posterior closure is "lenited" from a stop to a fricative, by lacking its **?** element.

Miller *et al* 2009 analyse clusters like (2a) as unitary segments with a linguo-pulmonic airstream contour, where the transition from the lingual to the pulmonic airstream occurs segment internally, and not at the end of the segment, as in a non-contour lingual stop. Such an analysis, however, is not possible for clusters like (2b), only involving pulmonic airstream.

Finally, to account for the extra C position required by the broken clicks, I adhere to Lowenstamm's 1999 strict CV skeleton, where the beginning of the word is identified by an empty CV-unit. In this way, clusters do not create extra complexity, they only use the space that is already available. In fact, breaking can rather be regarded as simplification of more complex structures. Note that the order of realisation of the anterior and posterior closure in a cluster is predictable in the same way as it is in a single click. I will utilise this in accounting for their behaviour with respect to front vowel assimilation (Naumann 2009).

Conclusion. Analysing clicks as double stop complex segments in Element Theory sheds light on the existence and peculiar properties of clusters in Taa, and it makes reference to airstream (contours) superfluous.

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