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## Phonotactic restrictions on ejectives: A typological survey

Different studies have looked at phonotactic restrictions on ejectives from a variety of perspectives focusing on syllable structure or on general patterns of laryngeal features, such as cooccurrence limitations or positionally motivated neutralization of contrast (Blevins 2004, Coulston 2001, MacEachern 1997, Maddieson 2004, Rimrott 2003, Steriade 1999). This paper brings together these diverse approaches suggesting that all phonotactic restrictions are based on articulatory and auditory features often working together. Given that languages vary with respect to articulatory features of their phonemes and with regard to perceptual similarity, different restriction patterns are found cross-linguistically.

Phonotactic restrictions on ejectives can be divided into two main types: a) ejectives do only or do not occur in certain positions and b) ejectives can only or cannot cooccur with certain segments. Hence, the main restrictions concern position within a syllable or word and cooccurrence with other segments within a syllable or word. Both restriction categories depend on the phonetic and phonological context, i.e. the types of segments that precede and follow, and can be attributed to articulatory and auditory features.

Ejectives are found in about 18% of the world's languages (Ladefoged and Maddieson 1996) with a strongly regional geographical distribution (Maddieson 2004). They occur in three areas: (1) the Americas, (2) Africa, and (3) the Caucasus. A total of 27 languages from all three geographical regions are examined. Although the languages are found in three major areas, there is great genetic diversity, in particular among the languages of the Americas. In Africa and the Caucasus, the languages are limited to two main families or branches in each of the regions: Semitic and Chadic in Africa and South and North Caucasian in the Caucasus.

In the examined language sample, positional limitations place ejectives either in onset position or at or close to the left edge of a domain. The motivations for these restrictions have an articulatory basis: the lack of a stop release in coda position, or an auditory basis: the presence of marked segments in a perceptually more salient position. Articulatory and auditory reasons work together: the lack of an audible release in coda position eliminates the primary phonetic cues for the perception of a contrast resulting in laryngeal neutralization.

Cooccurrence limitations in the examined language sample are all based on auditory similarity. However, languages differ in where they set the point at which similarity becomes unacceptable. As a result, similarity is gradient across languages. In some languages, identical elements may cooccur, but very similar ones do not. In others, similar elements may be found together, but dissimilar ones are not. Languages also vary with respect to the domain of the restriction. While some phonotactic cooccurrence restrictions are based on roots or morphemes, others depend on syllables or words.

To conclude, the analysis of 27 languages shows that all phonotactic restrictions on ejectives can be explained in terms of articulatory variation and ease and perceptual complexity and similarity.