

Sonority restricts laryngealized plosives in Southern Aymara

We examine the conditions for the occurrence of non-initial laryngealized plosives (ejectives and aspirates) in Southern Aymara roots in relation to the sonority of the initial segment. We show that the distribution of laryngealized plosives follows a sonority *curve*: laryngealized plosives are restricted with both low- and high-sonority initial segments, and are more freely attested with medium sonority initial segments. Previous work (Landerman 1994; MacEachern 1999; Mackenzie 2013) has focused only on the low-sonority part. In this paper, we go beyond that work and propose a theoretical analysis of the distribution of non-initial laryngealized plosives in Southern Aymara that predicts their acceptability in novel roots.

Lexicon study: We analyzed 1,968 disyllabic roots that we extracted from Büttner & Condori's (1984) dictionary of Puno Southern Aymara (Peru). FIGURE 1 shows the uneven distribution of non-initial laryngealized plosives with regard to the sonority of the initial segment: they are restricted in plosive-initial roots (8%) and vowel-initial roots (9%), more acceptable with glides (24%), and most attested in roots that begin with segments of medium sonority, i.e. fricatives (37%), nasals (34%), and liquids (40%). The blue curve in FIGURE 1 is based on a LOWESS regression.

Analysis: According to De Lacy (2003), categories in a scale such as sonority can be conflated in constraints that stand in a subset relation with respect to their violation marks, that is, a stringency hierarchy. Thus for the sonority scale Vow>Gli>Liq>Nas>Fri>Plo, the stringent constraints that penalize co-occurrence with non-initial laryngealized consonants in Southern Aymara are the ones in (1), starting with $*\{\text{VOW}\}\text{LAR}$, which penalizes a root containing both an onsetless initial syllable and a laryngealized plosive. Independent evidence shows that, in Southern Aymara, onsetless syllables are largely dispreferred and only appear in root initial position (Cerrón-Palomino 2000).

- (1) Stringent constraint family: $*\{\text{VOW}\}\text{LAR}$, $*\{\text{VOW, GLI}\}\text{LAR}$, $*\{\text{VOW, GLI, LIQ}\}\text{LAR}$, $*\{\text{VOW, GLI, LIQ, NAS}\}\text{LAR}$, $*\{\text{VOW, GLI, LIQ, NAS, FRI}\}\text{LAR}$, $*\{\text{VOW, GLI, LIQ, NAS, FRI, PLO}\}\text{LAR}$

Using the MaxEnt Grammar Tool (Wilson 2006), we trained a MaxEnt weighted constraint model on the Southern Aymara lexicon using the constraints in (1). As expected, the model was unable to replicate the curve; the acceptability of internal laryngealized plosives did not drop from medium- to low-sonority initial segments. However, the effect of initial plosives can be captured with the addition of COINCIDE (McCarthy 2003), a constraint that penalizes laryngeal features not occurring on the leftmost plosive. The predictions of this analysis are shown in FIGURE 2, which also contains a curve based on a LOWESS regression. More powerful approaches, e.g. ones with constraints targeting each sonority level individually, offer only a modest improvement to this analysis. We also used the UCLA Phonotactic Learner (Hayes & Wilson 2008) and trained a phonotactic model on the Southern Aymara lexicon. The UCLAPL predictions match the lexical statistics very closely and generate the sonority curve, even if many of the phonotactic constraints do not target the sonority hierarchy.

Conclusions: We have identified previously unknown restrictions on the distribution of non-initial laryngealized plosives in Southern Aymara roots. By using stringent constraints for the sonority hierarchy and a restriction on the position of the laryngeal features in a root, we have offered an analysis that predicts the acceptability of non-initial laryngealized plosives in novel roots. We are currently preparing to test these predictions with a nonce word rating task with native Southern Aymara speakers in Peru and Bolivia.

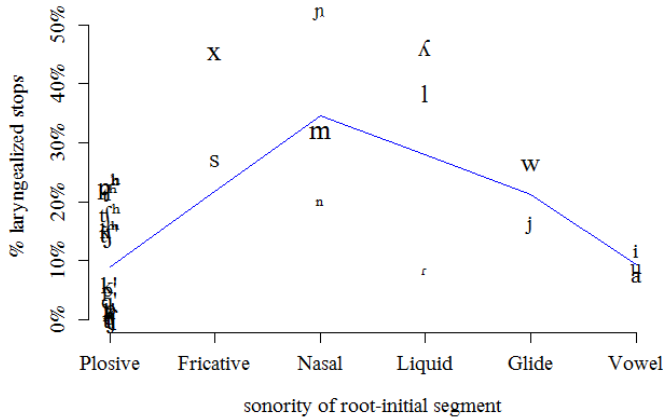


FIGURE 1. Observed percentage of non-initial laryngealized plosives for each root-initial segment

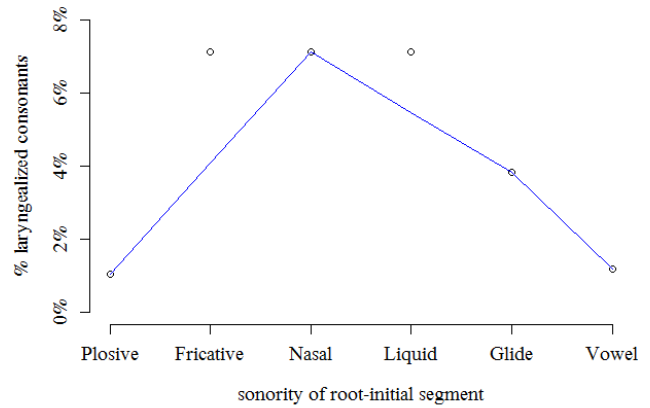


FIGURE 2. Predicted percentage of non-initial laryngealized plosives for the whole lexicon

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