Yuni Kim (University of Manchester)
Margarita Valdovinos (Ibero-American Institute of Berlin)

**The interaction between laryngealized vowels, stress and falling pitch in Mariteco Cora word prosody.**

In this paper we present a first exploration of the role of pitch in the word-prosodic system of Mariteco Cora (*Ch$^{w}$ísetaana Náayeri*). Cora is a Uto-Aztecan language from the Sonoran family spoken in the state of Nayarit, western Mexico, by 20,000 speakers (INEGI 2010), from which around 5,000 speak Mariteco Cora. The first modern studies of Mariteco Cora did not mention tonality (Preuss 1932), while subsequent ones pointed out the existence of a tonal system, but did not propose enough elements to establish a clear definition of its structure (Casad 1984). Until now, the only other phonological analyses of Cora consist of unpublished sketches (Casad, undated; Valdovinos 2010-2013), in contrast to Huichol (Grimes 1959: 221-232; McIntosh 1945: 31-35), the closest language related to Cora.

Our research is based on recordings of the 200-word Swadesh list made with younger speakers of Mariteco Cora (Valdovinos 2010-2013), as well as the lexical list proposed by Haspelmath and Tadmor (2009) adapted by the INALI for Meso-American languages, recorded (2010-2012) with speakers of different ages. Both isolated words and words in various morphological contexts were recorded. Inspired by recent work uncovering hybrid stress-tone systems in other Uto-Aztecan languages (e.g. Caballero 2012), and from our initial observations of lexically specific rising and falling pitches in some stressed syllables, we investigate whether Mariteco Cora has phonologically contrastive tone in addition to lexical stress. Our analysis is based primarily on the data obtained from one teenaged woman and one 60-year-old man.

Distributional and phonetic analysis of words in isolation indicate that the lexically specific pitch patterns do not represent an independent contrast, but rather are cues to vowel laryngealization and length. In this paper we focus on phonetic variation in the realization of laryngealized vowels. Stressed laryngealized vowels, and unstressed laryngealized vowels in non-final position, are systematically realized with falling F0. Importantly, the falling F0 contour is found even where a laryngealized vowel has little to no actual creaky voice; similar variations have been observed in laryngealized vowels in Mixtec (Gerfen & Baker 2005). It appears that all of the lexically specific falling F0 contours can be accounted for by considering them as cues to laryngealization, and that despite the absence of phonetic creaky-voice cues on some laryngealized vowels, tone and laryngealization do not independently contrast (cf. Whorf, et al. 1993 on pitch and stress in Nahuatl).

We describe several parameters that appear to affect the phonetic realization of laryngealized vowels along the voice-quality and pitch-excursion continua. One is stress: unstressed laryngealized vowels are more likely to be realized with creaky voice rather than falling pitch, which is perhaps unsurprising due to the role of pitch as a cue to stress in Cora. Particularly illuminating in this regard are morphologically conditioned stress shifts that allow us to observe stressed vs. unstressed alternants in the same words. Second, we compare monosyllables and disyllables. Thirdly, we consider morpholexical factors, namely specific words that consistently occur in our data with falling F0 and no creak. Lastly, we present data from several speakers of varying ages that suggests the youngest population produces more clearly laryngealized vowels whereas the eldest tends more to produce the characteristic pitch patterns (cf. work on the synchronic and diachronic relationships between falling pitch and creaky voice in Danish; e.g. Grønnum et al. 2013).

The findings open a number of puzzles for future research. We note that no laryngealization contrasts were observed on stressed final syllables of disyllables in isolation, possibly due to final neutralization processes affecting vowels; for a full picture it is therefore important to study the realizations of these words in suffixed, phrase-medial, and other non-pre-pausal contexts. Phonetically, the discovery of variation in laryngealized-vowel realizations raises the question of what exactly the relevant cues are. Detailed quantitative work, incorporating additional potential cues such as amplitude and spectral tilt, will be a prerequisite to the kinds of perceptual studies that can resolve these issues.

**Summary.**

This is the first study of Cora phonology that considers the existence of interactions between pitch, stress, and laryngealization. Our analysis reveals a word-prosodic system that is of comparative interest for Uto-Aztecan phonology, as well as for general cross-linguistic typology of word prosody. The phenomena we uncover may shed light on diachronic pathways to understanding the origins of laryngealized vowels, as well as on the study of synchronic relationships between different word-prosodic parameters.

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