Characterizing F0 as a correlate of stress in Rebkong Amdo Tibetan: a work in progress

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In this talk I will present the most recent findings of my current research in characterizing pitch traces in Rebkong Amdo Tibetan.

The term "Tibetan" is often used rather loosely, as if referring to a single language spoken in the Tibetan Autonomous Region of China. In fact, though, according to recent estimates, there are over 200 varieties of Tibetan, which can be classed into 25 distinct – i.e., mutually unintelligible – groups (Tournadre 2005, 2008). These languages are spoken across the domain of the ancient Tibetan empire, an area that today spans parts of five countries: Pakistan, India, Nepal, China, and Bhutan.

Based on their phonology, these "Tibetic" languages (Tournadre 2008) are commonly divided into two categories (Jaeschke 1871, cited in Bielmeier 1988; Rona-Tas 1966): the non-tonal "Archaic" varieties spoken at the eastern and western extremes of the Tibetan language area, and the tonal "Innovative" varieties spoken across the vast central region. In Caplow (2009) I described the stress patterns and stress correlates of two Archaic dialects – Balti Tibetan (spoken in Baltistan, northern Pakistan) and Rebkong Amdo Tibetan (spoken in Qinghai Province, China) – and, based on this data, reconstructed the stress patterns and stress correlates of Proto-Tibetan.

My current research focuses more closely on the behavior of fundamental frequency in Rebkong Amdo Tibetan. In this variety of the language (as in Balti), disyllabic non-verbs (nouns, adjectives, and numerals) are stressed on the second syllable (σ2; in contrast with verbs, which are stressed on σ1), and the primary acoustic correlate of this stress pattern is fundamental frequency. However, speakers can manipulate fundamental frequency in different ways in order to convey σ2 prominence; that is, F0 can be said to have two "reflexes", which I call "pitch slope" and "pitch".

"Pitch slope" refers to a sharp, steep fall in F0 over the rhyme of σ2, the stressed syllable. This σ2 pitch slope is highly perceptible: I was immediately struck by it the very first time I heard Rebkong Amdo Tibetan, and it has also been described for Ndzorge Amdo Tibetan by Sun (1986:58; "a high-falling tune"). The corresponding pitch trace in Praat (or other acoustic software) is a steep, almost-perfectly-straight line. This σ2 slope contrasts with a level (or nearly level) F0 across the rhyme of σ1. In some cases, though, the prominence of σ2 is expressed not as a steep downward pitch slope, but instead simply as a higher average F0, compared to that in σ1. This I refer to as a contrast in "pitch".

When F0 is level (more or less) or shows a steep constant fall, it can be readily quantified – as average F0, or as $\Delta F0 / \Delta time$ – for comparison across the two syllables of a disyllabic word, thus making it possible to test for a correlation between F0 and perceived stress.

The problem arises when the pitch trace is not straight (either level or falling), which makes it difficult to quantitatively compare F0 across syllables. Several other pitch patterns can be observed: a high plateau followed by a gentle fall, an increase to a gentle peak followed by a fall, and intermediate curve types.

In this talk I will report on my progress in quantifying and classifying these curves using statistical methods such as principal component analysis and exploratory growth modeling.

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