

Acoustic Correlates of Contour Tones of Hainan Cham

Elzbieta Thurgood

California State University at Chico

This study investigates the characteristics of tones in Tsat, an endangered language spoken on the island of Hainan. The study examines the primary characteristic: the level, direction and rate of change of the "pitch", that is, the fundamental frequency (F0) of the vibration of vocal cords, and the secondary characteristics: vowel duration and quality, the presence or absence of a coda, and the voice quality (modal versus falsetto versus creakiness).

Except for the excellent acoustic study by Maddieson and Pang (1993), none of the work on Tsat tones has been instrumental. The sources in the literature, including Maddieson and Pang (1993), all agree that there are five tones in Tsat, labeled high, rising, mid, low, and checked fall. The high tone has a strikingly high pitch, while the remaining tones cluster together in the mid-to-low range.

The present acoustic study of Tsat tones is based on the author's greatly expanded data base gathered during fieldwork in the summer of 2004 in Hainan and consisting of recordings of words produced in citation form by six speakers (three females and three males).

The study concentrates on the clusters of features that distinguish Tsat tones. The duration of a vowel correlates with the pitch pattern, for instance, the vowels of the rising tone are longer than those of the falling tone and the mid and low tones tend to be longer than the high and falling tones. The presence or absence of a coda also helps distinguish the tones. In Tsat, words can be terminated by a glottal stop, a [t], a [k], or a glottalized nasal, each of which is accompanied by a slight variation in the tone contour. Finally, to some degree voice quality differences correlate with pitch patterns and coda types.