

Why do tones shift?

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Introduction. The investigation of why and how sound change occurs has for the most part been limited to segmental phonology and certain prosodic structures such as the location and acoustic cues of stress. This leaves open questions about the elements of intonation: namely pitch accents, boundary tones, and the phonological rules that apply to them. How do these structures develop, and what types of sound changes are expected to apply to them?

This paper provides evidence on the emergence of two tone-shifting patterns: 1) the shifting of prenuclear L in Seediq; and 2) a spreading-shifting alternation in Kavalan. Both of these patterns appear to ‘avoid’ certain structures in tonal alignment, and in both cases, it is likely that the shifting behavior is innovated, and developed from a previous spreading behavior.

Data. The data from this paper was obtained as part of a study of prosody and intonation in the Formosan languages, i.e. the Austronesian languages of Taiwan. This language group provides a unique glimpse into the diachrony of intonation, as many of the languages, despite their geographic proximity, have no common ancestor more recent than Proto-Austronesian, spoken thousands of years ago (Blust 2013). Nonetheless, the modern Formosan languages have retained enough similarities in their intonational phonology that there is evidence for which patterns are innovations, and what other structural factors may have facilitated these innovations. The study included original elicited data from 14 Formosan languages/varieties: Mantauran/Budai Rukai, Tsou, Kanakanavu, Saaroa, Piuma/Tjaylaking Paiwan, Kavalan, Amis, Bunun, Tgdaya/Toda/Truku Seediq, and Pazeh. This data was analyzed through the Autosegmental-Metrical framework of intonational phonology (Pierrehumbert 1980).

Spreading and shifting tones. Two phonological rules that recur in the tonologies of the world’s languages are the spreading and shifting of tones (Hyman & Schuh 1974). Both processes involve movement of a tonal element from its underlying position towards a domain edge: the difference is that tone spreading leaves a copy of this tone at every intermediate position, while tone shifting does not. For example, (1–2) show the outputs of tone spreading and shifting rules from a five-syllable input of / H L _ _ _ /, where H represents a high tone, L a low tone, and _ a syllable unspecified for tone:

- (1) / H L _ _ _ / → [H L L L L] Tone spreading
(2) / H L _ _ _ / → [H _ _ _ L] Tone shifting

The prenuclear L in Seediq. In all of the Formosan languages under study, a pitch accent melody is aligned to the stressed syllable of the word. This contains a ‘nuclear’ element H*, realized as an F0 peak, and in most cases also a ‘prenuclear’ L tone that precedes the H*. In most Formosan languages this prenuclear L spreads to the beginning of the word, leaving a low flat tone preceding the peak (cf. Fig.1). In Seediq, this tone instead shifts, and the surfacing F0 contour is a steady climb on the three syllables until the peak on [sú] (Fig.2).

I argue that this shifting behavior in Seediq is related to another pattern in the language: the reduction of all vowels preceding the (stressed) penult to schwa. As schwa in Seediq and many other languages is short in duration, listeners may have difficulty hearing tones aligned to these syllables. If the listener is unable to hear the L on the syllable immediately preceding

