“Rising” Intonation on “Falling” Tones

The nature of the interaction between sentence level intonation and lexical tone varies from language to language. This is clearly evident in how “rising” intonation (an intonational contour that is perceived as rising) interacts with the lexical tones on words near the right edge of the utterance in different languages. Adherents of the ToBI-style notation (Pierrehumbert and Beckman 1988, e.g.) analyze such utterances as bearing a H boundary tone at the right edge. While this is a reasonable analysis, it is a necessarily language-specific one that is insufficient for capturing the typological variation that is apparent across languages. Rather, it seems useful to specify a rise onset point (henceforth ROP) for each language. Without knowing this parameter, it is impossible to predict the shape of the F0 curve of an echo question based solely on the lexical tones associated with the words in the utterance and the presence of a H boundary tone. Besides this parameter, there are often tone-specific F0 patterns within a given language that make it difficult to maintain an analysis of a purely parallel interaction between tone and intonation. This is supported by results from production and perception experiments that were conducted in several languages for this study, including Shiga Japanese, Mandarin, Cantonese, and North Kyeongsang Korean.

**Shiga Japanese:** Unlike in Tokyo Japanese, finally-accented words in SJ retain the drop in pitch associated with the accent on a final light syllable, thus maintaining the contrast between finally-accented and unaccented words. The realization of the pitch drop in this dialect does not seem to require a lengthening of that final mora/syllable. Meanwhile, when pronounced with an echo question intonation, the final mora of a finally-accented word still displays a sharp rise after the drop associated with the accent. The realization of this rise is accompanied by a drastic lengthening of the last mora (more than doubling its length in most cases). (See Figure 1a)

**Mandarin:** Echo questions in Mandarin (Putonghua) are characterized by a raising of the overall pitch level that causes a final lexical falling tone to be in a higher range than in a declarative utterance (but falling nonetheless). Xu (2005) shows evidence that, in sentences with a focused element, the overall F0 is raised from the focused element to the end in the case of echo questions, while in sentences with “neutral” focus, the F0 starts rising from the start of the utterance. Results from the present production study confirm the latter result. We also see that the effect of the echo question intonation on the tones is tone-specific (also noted by Yuan 2004); the first and second tones seem simply to be shifted upwards, whereas the third tone gets pulled down just as low as a declarative third tone but then ends much higher and the beginning of the fourth tone gets shifted upwards to a greater degree than the end. Overall, we don’t see duration effects in Mandarin that are comparable to those seen in SJ. (See Figure 1b)

**Cantonese:** In Hong Kong Cantonese, the intonational rise of an echo question is realized on the final syllable. The results of the present study show that, unlike in Shiga Japanese, a final falling tone in Cantonese does not complete its fall before the rise is initiated (c.f. Wu 1990, who reports that “the rise starts after the fall” and Yip 2002, who claims that the tone starts where it would in a declarative context and ends “high”). Like in Mandarin, we see some tone-specific effects. Also like in Mandarin, the duration of the final syllable is not affected to the degree that we see in SJ. (See Figure 1c)

**North Kyeongsang Korean:** Despite its status as a so-called “pitch accent” language, NKK behaves less like SJ and more like Mandarin when it comes to the reconciliation of a lexical HL sequence with rising intonation. If the HL sequence falls on the last two syllables, we still see a lower F0 on the second syllable, though not as low as in a declarative context. (See Figure 1d)

If we posit an ROP whose locus is constrained differently for each of these languages, we can better capture the typological variation described above. For Mandarin and NKK, the ROP is located before the final syllable. For Cantonese, it is contained in the final syllable. For SJ, it is at the onset of the final syllable if that syllable is unaccented; otherwise it is located after the final syllable, necessitating the lengthening of the final mora in order to realize the high target. An ROP parameter not only gives us better descriptive power but also provides a possible explanation for cross-linguistic differences in perception (for example, Cantonese speakers are better at identifying the sentence type of an echo question but not as good at identifying the final lexical tone, whereas the reverse is true for Mandarin speakers).
Figure 1: A schematic representation of the interaction of lexical LH tones with rising intonation associated with echo questions in (a) SJ, (b) Mandarin, (c) Cantonese, and (d) NKK. The rise onset point for each language is indicated by a red arrow.

References


