Categorization of Cantonese Lexical Tones by Japanese-speaking Novice Listeners and Learners of Chinese Mandarin

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Previous studies (e.g., So, 2005, 2010) suggest that Japanese listeners can generally utilize their pitch-accent prosodic system to perceive lexical tones in Chinese Mandarin. However, Wong (2019) showed that for the case of Cantonese tone perception, although Japanese-speaking Mandarin learners performed better for 'easy' pairs with dissimilar contours, they did no better than novice listeners for acoustically 'hard' pairs within the level-level pairs (T3-T6 and T1-T6), as well as the rise-level tone pair (T2-T5). On top of this, novice listeners showed extra difficulty in distinguishing the low falling tone (T4) with a level tone (middle level (T3) / low level (T6)). In order to obtain a clearer picture of the perception of Cantonese tones, a follow-up study was conducted to examine how the Japanese listeners would assimilate the six lexical tones into their pitch-accent patterns.

The six tones of the diphthong /ai/ uttered by a phonetically trained Cantonese native speaker in Hong Kong were used as stimuli for categorization. Results showed that novice listeners (n=21) and Mandarin learners (n=12) assimilated Cantonese lexical tones into their pitch-accent patterns in similar ways. Japanese listeners generally categorized in ways that were consistent with the phonetic similarities of the Japanese language (see Figure 1). Additionally, results (Figure 2) also showed that Mandarin learners, but not novice listeners, were more likely to assimilate the mid-level tone (T3) and low-level tone (T6) into a HH accent pattern. This accounts for the reason that Mandarin learners were reported to have difficulty in distinguishing T3-T6 pair even more than the novice listeners. Moreover, since there is a tone sandhi rule in Mandarin which states that T3 (214) becomes T2 (35) before another T3 and becomes a low falling tone (21) when preceding other tones. Hence, T2 and the low falling tone can be viewed as allotones of T3. The Cantonese T4 (21) could thus be assimilated to the Mandarin T3 (21). This provides an explanation for the less confusion of Mandarin learners for the T3-T4 and T4-T6 pairs. The findings generally support the predications of Perceptual Assimilation Model (PAM; Best, 1995).

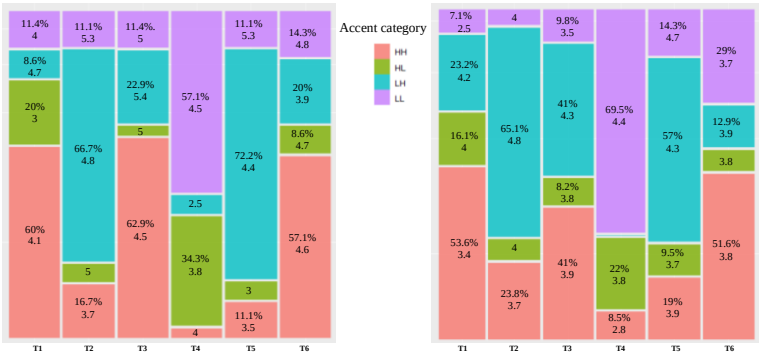

Figure 1: Categorization percentages (top) and goodness (bottom) for Cantonese tones (left: L2 Mandarin learners; right: novice).

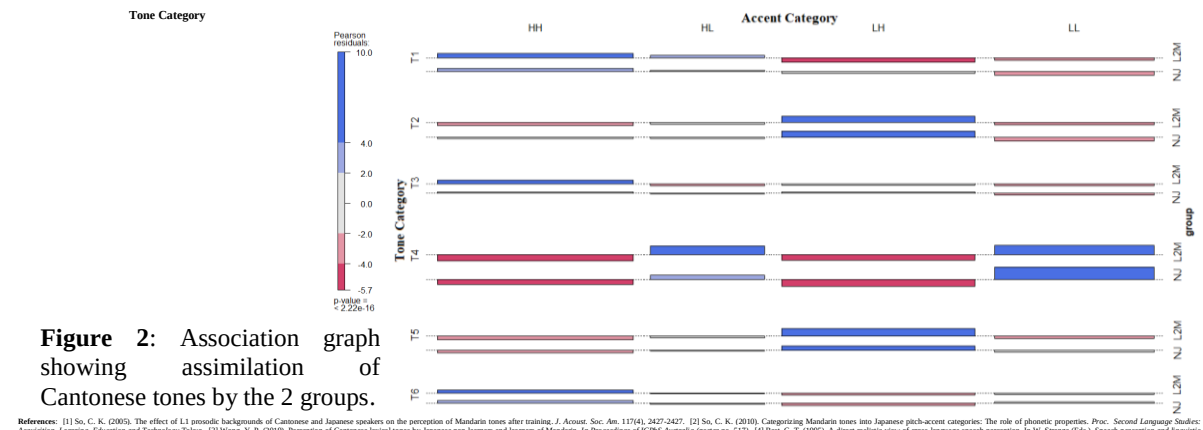

Figure 2: Association graph showing assimilation of Cantonese tones by the 2 groups.

References: [1] So, C. K. (2005). The effect of L1 prosodic backgrounds of Cantonese and Japanese speakers on the perception of Mandarin tones after training. *J. Acoust. Soc. Am.* 117(4), 2427-2427. [2] So, C. K. (2010). Categorizing Mandarin tones into Japanese pitch-accent categories: The role of phonetic properties. *Proc. Second Language Studies: Acquisition, Learning, Education and Technology* Tokyo. [3] Wong, Y. P. (2019). Perception of Cantonese lexical tones by Japanese non-learners and learners of Mandarin. *In Proceedings of ICPhS Australia (poster no. 517).* [4] Best, C. T. (1995). A direct realistic view of cross-language speech perception. In W. Strange (Eds.), *Speech perception and linguistic experience: Issues in cross-language research* (pp. 171–204). Baltimore: York Press.