Language dominance influences L1 attrition and L2 acquisition of lexical tones: Data from Mandarin-speaking immigrants in Hong Kong

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Language dominance is a broad concept that covers various domains of bilingual speakers' languages [1]. Previous investigations of language dominance have mainly focused on the sociolinguistic or individual perspectives, while the role of language dominance in first language (L1) attrition and second language (L2) acquisition of lexical tones remains underexplored. This study aims to address this issue by exploring the production of L1 and L2 tones by Mandarin-speaking immigrants in Hong Kong, who were late Mandarin-Cantonese speakers with varying degrees of language dominance. There are four lexical tones in Mandarin: Tone 1 (T1) is a high level tone, Tone 2 (T2) is a rising tone, Tone 3 (T3) is a low dipping tone and Tone 4 (T4) is a falling tone [2]. In Cantonese, there are six lexical tones: Tone 1 (T1), Tone 3 (T3) and Tone 6 (T6) are level tones, Tone 2 (T2) and Tone 5 (T5) are rising tones, and Tone 4 (T4) is a low falling tone [3]. Testing the effects of language dominance on Mandarin tone attrition and Cantonese tone acquisition is of theoretical significance due to the obvious differences in the two tonal systems.

A tone production experiment was conducted with 32 Mandarin-speaking immigrants who had spoken Mandarin as their only Chinese dialect prior to their arrival in Hong Kong. According to a language background questionnaire [4], the immigrants were fluent speakers of Mandarin and Cantonese. Two syllables that contained all the possible tones were selected as the target syllables for the stimuli in each language. There were eight monosyllabic target words for Mandarin (2 target syllables * 4 tones) and 12 monosyllabic target words for Cantonese (2 target syllables * 6 tones). The syllables were presented in two contexts: in isolation and embedded in a carrier sentence. All the stimuli were presented twice to each speaker. For each syllable, the vowel portion was segmented, and 20 time-normalised F0 values were extracted using Praat [5]. To eliminate individual differences in the F0 range, the F0 values were converted to a five-point scale ranging from 1 to 5, with 1 representing the lowest F0 value and 5 indicating the highest. In the analysis, generalised additive mixed models (GAMMs) were adopted for modelling time-dependent datasets in R [6].

The 32 participants were divided into two dominance groups according to their scores on the language background questionnaire: a balanced group, who were relatively balanced in their two languages and whose Mandarin was assumed to show a higher degree of attrition, and an unbalanced group, who were still much more dominant in Mandarin than they were in Cantonese. According to the GAMMs, the unbalanced group could clearly distinguish the four Mandarin tones regardless of the context (ps < .001), but the balanced group had merged T2 and T3 when the syllables were pronounced in the carrier sentence (p = .176), suggesting that language dominance had led to the attrition of their L1 Mandarin. With regard to Cantonese, the balanced group had merged T3 and T6, both in the isolation (p = .236) and in the sentence (p = .674) conditions. The unbalanced group had merged T2 and T5 in the isolation condition (p = .219), and T3 and T6 in both the isolation (p = .986) and sentence (p = .324) conditions. Both groups were able to distinguish the other Cantonese tone pairs in other conditions. The data for the Cantonese tones indicated that the more balanced bilinguals had acquired the Cantonese tones more successfully, revealing the role of language dominance in L2 tone acquisition. The tone production was plotted in more detail in Figures 1 and 2, which confirmed the statistical analyses above. Moreover, Figure 1 shows that, compared to the unbalanced speakers, the balanced bilinguals had a smaller tonal space in Mandarin, which should have been influenced by Cantonese, as both groups exhibited a smaller tonal space in Cantonese than they did in Mandarin. Based on the data pertaining to L1 and L2 tone production, this study supports the claim of the Prosody Transfer Model, namely that prosodic features can be transferred between an L1 and an L2, even among late L2 learners [7].

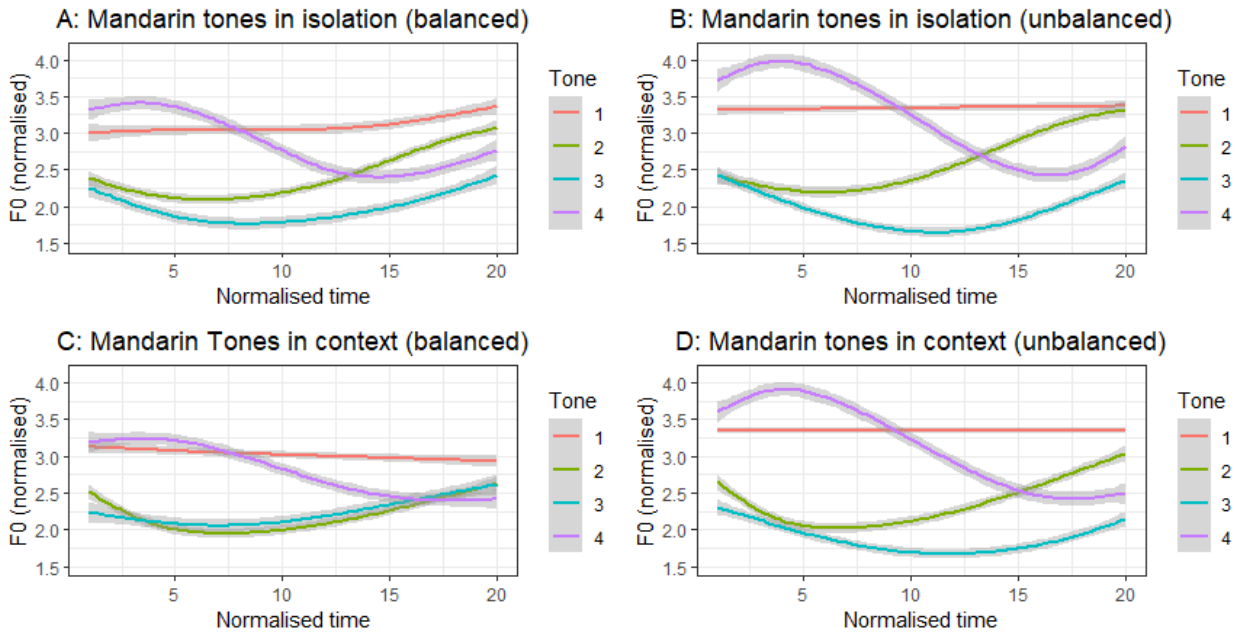

Fig.1 Production of Mandarin tones by the immigrants.

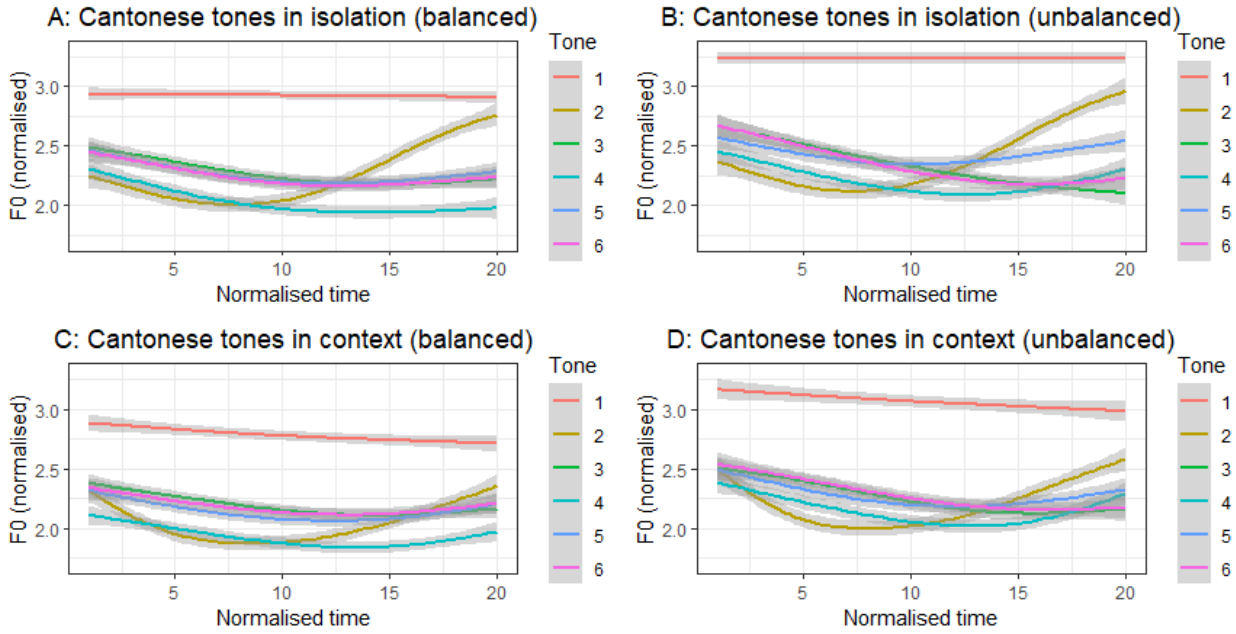

Fig.2 Production of Cantonese tones by the immigrants.

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