Do Chinese-English bilinguals attrite their L1 tones in perception and production in an L2 speaking environment?

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Late bilinguals who continue to use their native language while using an L2 every day and/or residing in the L2 community have been shown to exhibit changes in their L1. The majority of the research on changes in L1 use and possible L1 attrition has focussed on the lexicon, morphology and syntax (Schmid 2002), but in recent years, attention has moved to phonology. Tonal attrition has received the least attention.

In Mandarin, tone is used to differentiate lexical items or to express morphological functions. There are four tones in Mandarin: the level first tone (T1), the rising second tone (T2), the falling-rising third tone (T3), and the falling fourth tone (T4). Among these, the tone considered to be the most complex is T3. Tone sandhi also applies to T3 where for two adjacent T3s, the first T3 is realized as T2 (Yip 1980). T2 and T4 show tone variations with different tones followed. In trisyllabic sequences, the middle T2 changes to T1 if the first syllable is T1 or T2 and the final syllable is a random tone from four tones.

Several studies over the past decade of Mandarin bilinguals have revealed attrition of tone by L1 Hakka Chinese speakers living in a Mandarin-speaking area (Yeh, 2011). Little is known, however, about what happens when a tone language speaker moves to a non-tone language environment.

The present study addresses whether there are changes in tone production and perception by Mandarin speakers living in a non-tone language speaking environment (the UK) for varying lengths of time. The study compares 50 Mandarin-English late bilinguals who had been living in the UK from three months to more than five years with Mandarin monolinguals (only with minimal English exposure at school) living in mainland China. Their perception and production of four tones at word and sentence level were tested by a listening comprehension task, an interview task, and a story-telling task for both formal and more casual speech. A questionnaire collected data on speakers' use of and contact with both languages.

The data were analysed acoustically using Praat (version 5.4.22) speech analysis software (Boersma & Weenink 2015), and statistical measurement revealed that late bilinguals who had lived in the L2 environment for over five years showed signs of attrition on T3, tending to omit the raising part in production, and the first T3 in tone sandhi. The bilinguals' four tones showed a tendency to merge, rendering them less distinctive than the control group's tone production. Age of arrival, amount and type of L2 exposure and of L1 contact showed correlations with tone attrition. Moreover, some patterns mimic tone acquisition (Li and Thompson 1976; Lin 1985; Chang 2014) indicating that markedness plays a role in both acquisition and attrition.

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