Dynamics of /r/-colouring: Perspectives from L2 Acquisition

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Introduction The previous literature suggests that there are consistent differences between /r/-coloured vowels in Mandarin Chinese and American English: /r/-colouring is almost simultaneous with the onset of the preceding vowel in Mandarin (Wang & He, 1985), whereas the English vowels with postvocalic /r/ form centring diphthongs with a distinct vowel quality for the first element (Kenyon, 1935). The present acoustic study investigates whether such dynamic differences affect L2 English as produced by L1 Mandarin speakers.

Methodology The test items included 12 minimal pairs, or near minimal pairs in English, where the presence/absence of the final /r/ was systematically manipulated. These test items were matched with similar sequences in Chinese. 10 Mandarin speakers (4 males, 6 females) and 10 native speakers of American English (3 males, 7 females) participated in the experiment. The Chinese speakers were asked to read both English and Mandarin words. Three repetitions were recorded. F1, F2, F3 and F4 were measured at 10% intervals throughout the vocalic proportion using the Burg LPC algorithm implemented in Praat. The formant values were normalised within speaker. The trajectories of F2, F3 and F3-F2 were then analysed as acoustic correlates of rhoticity.

Result and discussion Comparison of rhotic and non-rhotic vowels in the two languages confirms that rhoticity affects the entire vocalic portion in Mandarin, but it is relatively delayed in English. However, Mandarin /i/ is an exception. It resembles the English rhotic /i/ with two separated parts in the vocalic proportion. It might be a result of the high degree of tongue-palate contact in /i/, which makes this vowel less susceptible to the anticipatory coarticulation of post-vocalic /r/ (Recasens, 1985).

Comparing the F2 and F3 trajectories for /r/-coloured vowels in L1 English vs. L2 English, it can be seen that, in general, the L2 English speakers did not transfer their native Mandarin to their production of the English rhotic vowels. The formant trajectories of the /r/-coloured vowels in the L2 production closely approximated the L1 English pattern. Surprisingly, for most vowels, we find that the rhoticity is delayed in L2 English, compared to the native pattern, as manifested by a relatively delayed rise or fall in F2 and drop in F3. This suggests that L2 speakers are aware of the target dynamic pattern, although they may not be able to produce the exact target timing.

Conclusion Although unaffected by their native language on formant patterns, L2 speakers hypercorrect the English r-coloured vowels with regard to timing. The future work may involve placing the Mandarin /r/-colouring within the wider context of coarticulation in L2 acquisition.

References

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