

Process vs. Result: Evidence for Coarticulatory Process Difficulties in French-speaking Learners of Mandarin

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Abstract

Mastering tonal coarticulation is a key challenge for L2 learners of Mandarin. This study investigates the demanding T4-T1 tonal sequence to tease apart difficulties in motor planning (process) from those in target attainment (result). We compare 139 sequences produced by eight native French-speaking learners of Mandarin and eight native speakers of Mandarin, elicited through a controlled question-response task. French L1 learners were selected as a representative non-tonal L1 group. Whether the same patterns hold for other non-tonal L1 backgrounds remains to be tested. Using linear mixed-effects models, we analyze (i) the timing of cross-syllable F0 transitions, (ii) the within-syllable F0 dynamics, and (iii) the resulting T1 target realization, with all measures automatically extracted via a Praat script.

Results reveal a consistent process-level disruption among learners of Mandarin. First, learners produce longer T4–T1 transition times, indicating slower cross-syllable coordination. Second, although the magnitude of the T4 fall is native-like, learners reach the T4 valley significantly earlier within the syllable. This premature valley alignment appears to trigger a marked mid-syllabic F0 “sag” (i.e. dip) in the first T1 syllable. This process-level error, in turn, is associated with a deeper mid-syllable sag in L2 T1a although the group difference in overall T1 height was not significantly significant. Overall, the findings indicate that L2 tone production difficulties stem more from imprecise motor planning and coarticulatory timing across syllables than from limits in reaching the tonal target.

Index Terms: tonal coarticulation, L2 prosody, Mandarin Chinese, carry-over effect