The perception of Japanese pitch accent and segmental contrasts by L2 learners

Marco Fonseca, University of Illinois at Urbana-Champaign

Introduction: The Speech Learning Model (SLM [1]) and the Perception Assimilation Model (PAM, [2]) are two prominent models that address the acquisition of L2 sounds. While their predictions differ, both models agree that sound categories/gestures that exist in a learner's L1 will influence their perception of L2 sounds. This study aims to examine how L2 learners native speakers of English (L2 learners) perceive three different types of lexical contrast in Japanese: voiceless vs. voiced stops (e.g. [kakko:] 'outfit' vs. [gakko:] 'school'), long vs. short vowels (e.g. [biru] 'building' vs [bi:ru] 'beer'), and words with lexical pitch accent on their first syllable vs. last syllable (e.g. [áme] 'candy'vs [amé] 'rain'). Studies on the perception of L2 contrasts focused mainly on the perception of phonetic differences ([3]) and less attention has been given to whether L2 learners can encode contrastive L2 categories in their mental lexicon (but see [4] and [5]). This study takes previous research further by employing an ABX discrimination task and a lexical assignment task, and by testing both segments and supra-segmental features.

Methods: Twenty-two advanced L2 learners and seventeen native speakers (NS) participated in an ABX task and in a lexical assignment task. They heard 60 words (ten minimal pairs for each type of contrast) recorded by a NS. The ABX included 120 tokens (60 items * 4 orders) and the lexical task had 60. In the latter task, participants were asked the meaning in English of the Japanese word, choosing between two options.

Hypothesis: If the assumptions of SLM and PAM can be extended to lexical encoding, it is possible to hypothesize that L2 learners can discriminate L2 words based on phonological distinctions that are relevant in the language. For instance, advanced learners of Japanese should be able to distinguish short from long vowels and initial accent from final accent.

Analysis/results: Linear mixed effects regressions were performed on accuracy and reaction times from both tasks. In the ABX both L1 and L2 speakers performed at ceiling in all three contrasts. Contrastively, in the lexical task, the two groups performed differently. Whereas for NS accuracy in all three contrast was above 98%, L2 speakers' accuracy was lower for accent contrast (70%), followed by stops (85%), and vowels (87%). Generally, L2 speakers had longer reaction times in the lexical decision task, especially for accent contrasts.

Conclusion: Results showed that L2 learners can accurately discriminate tokens based on the three L2 phonological features tested. However, they find it difficult to identify members of minimal pairs differing in vowel length and especially accent. SLM and PAM should be developed in order to explain lexical encoding. The fact that only 14% of the Japanese lexicon can be contrasted through pitch accent [6] may explain why L2 learners do not appear to encode accentual patterns in their mental representations of words. The main contribution of this study is as follows: even if they have learned to attend to L2 contrasts that do not exist in their L1, L2 speakers may still fail to fully use that distinction in their mental lexicon.

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