Assimilation patterns in L2 vowel production: Cuban and Peninsular learners of English
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It has been shown that the native dialect influences L2 perception (e.g. Escudero and Boersma 2004, Cutler et al. 2005). However, no study has explored the potential differences in L2 vowel production determined by the learner’s native dialect. Thus, the present research investigates how the English vowels /æ, ʌ, a/ are produced by learners with distinct native varieties, Cuban and Peninsular Spanish. Experiment 1 compares the native vowel spaces to determine the extent of the cross-dialectal differences and Experiment 2 assesses the differences in L2 production of two groups of learners having different native dialects. Based on existing reports on Spanish varieties (e.g. Morrison and Escudero 2007, Guitart 1996), a more fronted vowel space is predicted for the Peninsular (PS) as compared to the Cuban variety (CS). Given the differences between the L1 varieties, it is predicted that the L2 English vowels /æ, ʌ, a/ differ systematically for the two groups of learners and tend to be more fronted in the interlanguage of PS learners as compared to CS learners. Moreover, dialect-specific patterns of assimilation are predicted, with the /æ, ʌ/ vowels tending to merge into a front interlanguage category in the PS group’s L2 production and /ʌ, a/ tending to merge into a posterior category for the CS learners.

In Experiment 1, 40 Spanish native speakers (21 from PS, 19 from CS) read a series of pVpa and bVba real Spanish words (V is /i, e, a, o, u/) inserted in a carrier phrase. Acoustic measurements (F1, F2, F3, durations) were obtained from more than 800 vowels and normalized. A series of ANOVAs comparing L1 vowels showed that indeed the PS vowel space tends to be more fronted than in CS, in particular /i/ is higher and more fronted, and /o/ is more fronted in PS than in CS.

In Experiment 2, a subset of 19 participants (10 from PS, 9 from CS), advanced learners of English, were tested in a sentence completion task. The targets were CVC real English words (V is /æ, ʌ, a/ and C are stops or /h/). Six native English controls were tested with the same procedure. More than 1,100 vowels for L2 production and 450 vowels for the target language were analyzed. Twelve one-way ANOVAs were conducted for the /æ, ʌ, a/ vowels to compare the effect of the linguistic variety (English, PS, CS) on the F1, F2, F3 and duration of vowels. Then, within each dialect, L2 vowels were compared through a linear mixed model with repeated measures for vowels to determine whether the predicted pattern of category overlaps exists.

Overall, L2 learners produce vowels that differ from the target along at least one variable (F1, F2, F3 or duration). Moreover, L2 /ʌ/ and /a/ differ significantly between the two groups of learners in F1, F2 and, respectively, in duration. Within the PS group, however, most of the learners managed to produce the L2 vowels as three distinct spectral categories. They did not produce though any duration distinction between tense and lax vowels. Within the CS group, as predicted, /ʌ, a/ overlap, as they are produced with no significant spectral differences but with different durations. A closer look at the individual variation indicates that within the PS group, 6 out of 10 subjects display a clear /æ, ʌ/ overlap and within the CS group, 7 out of 9 subjects display a clear /ʌ, a/ overlap, the remaining subjects having an unclear pattern of vowel assimilation. Thus, while PS exploit the spectral, but not the temporal properties of the target vowels, CS tend to merge /ʌ, a/ spectrally into a posterior category while creating a duration distinction between them. Based on these findings, we conclude that phonetic differences between native dialects influence non-native production.
References