

L2 speakers' individual differences in the acoustic properties of the front-high English vowels: The case of Ecuadorian speakers

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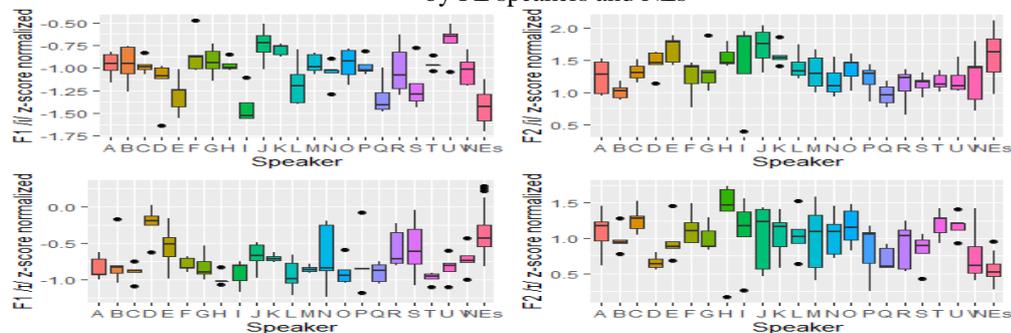
It is not surprising to find in a classroom setting second language (L2) speakers whose level of accuracy varies in the production of the target sounds. Most L2 speakers do not achieve near native-like pronunciation, especially if they learn the language during their adulthood [7]. Apart from the age of acquisition, some studies have demonstrated how learners' L1 backgrounds influence the accuracy of the L2 vowels. For example, L1 Spanish speakers of English fail to produce more accurately the English vowel sounds because they rely on vowel duration as acoustic cues to produce differences between the English tense and lax vowels, even though contrast on durational cues does not exist in the Spanish language [5, 12, 13]. Trying to explain which other factors impact the L2 acquisition, a large and growing body of literature has investigated the role of input [8, 10], the L2 language experience [1, 4, 9] the L2 aptitude [11, 13], and motivation [2]. Most of these studies have reported data on L2 acquisition in a naturalistic setting, indicating that as experience (numbers of years living in an English-speaking country) and input (exposure to native-speakers) increase, L2 English speakers can eventually learn to produce more accurately the sounds of the target language. At the same time, cross-sectional studies on group-level observations cannot describe how much individual variability exists between L2 speakers, especially when they learn English as a Foreign Language (FL), getting in most cases experience in the classroom with native and non-native teachers.

The aim of this study is to explore FL speakers' individual variability in the accuracy of the English vowel /i/-/ɪ/ produced by L1 Ecuadorian Spanish speakers and their ultimate attainment of the target vowel sounds acquired in a classroom setting. Two groups of speakers were recruited for this study. The native American English (NEs) group included 3 females and 2 males with a mean age of 24.4 years. The FL speakers group consisted of 22 L1 Ecuadorian Spanish monolingual speakers (16 female and 6 male adults) enrolled in the eighth level of the English Language Teaching program with a mean age of 25.9 and who had participated in the Phonetics and Phonology courses. 40 monosyllabic words containing the English vowel contrasts /i/-/ɪ/, /u/-/ʊ/, /ɛ/-/æ/, /ʌ/-/ɑ/ in a CVC and CVCC context were produced by the FL speakers. The same task was performed by the NEs. For this study, we only analyzed the tense and lax vowels /i/-/ɪ/. The recording session took place in the radio station of the university of Cuenca-Ecuador. A picture-naming task was used to elicit the target vowels and words were written in Spanish to avoid the effect of orthography in the production of the English segment phonemes [5, 8]. We used a Zoom H2n handy recorder at 44.1 kHz sampling, 16-bit quantization. To compare the spectral characteristics between each L2 speaker and NEs, we first manually annotated the vowel segments, using Praat software [3]. For individual vowels, we automatically extracted the mean of F1 and F2 using a Praat script. The two formant values were Lobanov z normalized, and two mixed effect models were applied for each vowel and speaker.

A visual inspection of the data indicated significant individual variability in the accuracy of the English vowels /i/-/ɪ/, ranging from some speakers who produced F1 and F2 values truly separated from other FL speakers and some who followed the trend of the group [Fig. 1]. The results of the two mixed effect models applied to each FL speaker and compared with NEs demonstrated that for the /i/ tokens 3 speakers got F1 values which were close to NEs criteria and 10 speakers produced F2 formant values within the same range as NEs did. For /ɪ/ tokens, 16 speakers got F1 mean values lower than NEs criteria. For the F2 mean values, most FL speakers did not reach NEs criteria, but two speakers

got F2 values similar to the model. The single most striking observation to emerge from the data was that no FL speaker could produce accurate F1 and F2 values for the two groups of vowels compared. These results demonstrate that not all the formants have the same level of difficulty to be produced by FL speakers, and speakers end up with different acoustic variability in terms of their ultimate attainment in a classroom setting.

Fig 1: Boxplot of the F1 and F2 formants values of the /i:/-/ɪ/ English vowels produced by FL speakers and NEs



Keywords: vowel accuracy, FL speaker, individual variability, classroom setting.

Acknowledgement

This project was funded partially by the University of Zurich-Graduate Campus, GRC Travel Grants.

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