Measuring phonetic distance between Catalan and English vowels: A bidirectional cross-language mapping study
Juli Cebrian
Universitat Autònoma de Barcelona
juli.cebrian@uab.es

One of the reasons why second language (L2) speech does not sound like native speech is interference from the first language (L1). Relative success in L2 acquisition has been linked to the ability to discern differences between L1 and L2 sounds. According to Flege (1995), the greater the phonetic distance between L1 and L2 sounds, the more likely it is that learners will categorize L2 sounds in a native-like fashion. Similarly, Best (1995; Best & Strange, 1992) proposes that L2 learners’ ability to perceive L2 contrasts will depend on the degree to which L2 sounds can be heard and categorized as an exemplar of an L1 category. These approaches critically rely on an accurate method of assessing cross-language phonetic distance. In addition to acoustic comparisons of L1 and L2 sounds, recent research has been evaluating phonetic distance by means of cross-language mapping experiments such as perceptual assimilation tasks (Schmidt 1996, Ingram and Park 1997, Strange, 1999; Flege, Bohn and Jang, 1997; Guion et al 2000). In these tasks, listeners with no L2 experience are presented with L2 speech stimuli and asked to indicate to which L1 phonetic category (if any) each L2 token is most similar, and rate its "goodness" as an exemplar of that category. The results are used to classify L2 sounds in terms of perceived distance, e.g. as identical, similar or new, in order to test the predictions of the different models.

This paper evaluates the perceived phonetic distance between a set of Catalan and English vowels by means of a bidirectional cross-language mapping study and examines the relationship between phonetic similarity and Catalans’ perception and production of these English vowels. Acoustic comparisons of English /i, ï, eî/ (as in ‘beat,’ ‘bit,’ ‘bet’ and ‘bait’) and Catalan /i, ë, eî/ (as in ‘nit,’ ‘nét,’ ‘net’ and ‘rei’) show a considerable overlap in F1 and F2 vowel space. A couple of perceptual assimilation tasks examined this further. In experiment one, Catalan speakers with no knowledge of English identified English vowels in terms of Catalan vowels and provided goodness of fit ratings. In addition, they also identified and rated Catalan vowels in order to obtain baseline results for L1 sounds. Despite the general acoustic overlap between the L1 and L2 vowels, the English vowels obtained different degrees of perceived similarity to the acoustically closest Catalan vowels. Some of the English vowels appear to be very similar or near identical to Catalan vowels. A second experiment was conducted in which English speakers identified and rated Catalan and English vowels in terms of English vowels. The goal of this experiment was twofold: to obtain baseline ratings for English vowels from English-speaking listeners, and to investigate what L1 sounds may pass as good instances of L2 sounds when produced in place of target L2 sounds in an attempt to differentiate between similar and near identical sounds. Based on these tasks, three of the English vowels were classified as near identical to Catalan vowels. An examination of L2 production and perception data from previous studies on Catalan learners of English (Cebrian 2003, 2004, in press) indicates that the combination of both L2-to-L1 and L1-to-L2 perceptual assimilation tasks best defines the degree of similarity between L1 and L2 sounds. Nevertheless, the results also show that phonetic similarity alone cannot account for all the production and perception data suggesting that other factors in addition to phonetic distance are at play in the categorization of L2 sounds.
References


