

Assessing cross-language perception: Korean neutralization in English obstruents.

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Current theoretical models of cross-language perception, such as Best's perceptual assimilation model (PAM: Best et al. 2001, *Journal of the Acoustical Society of America*, 109: 775-794) and Flege's speech learning model (SLM: Flege 1987, *Journal of Phonetics*, 15: 47 -65.) predict the perception of second language (L2) speech sounds on the basis of native language (L1) speech system. For example, PAM predicts discrimination levels of L2 contrasts based on the presence of L1 sounds. Similarly, SLM predicts the difficulty of producing segments in L2 based on the similarity of segments in L1. However, research in cross language perception often does not detail how to determine the similarity of segments across languages. In addition, these models do not refer to phonological entities that generalize across segments, such as L1 phonological rules or prosodic constraints on segmental distribution, but treat phonological systems as inventories of segments. Though these inventories might differ, say, in pre- and post-vocalic position, there is no rule or constraint generalizing across segments or prosodic location.

We develop a methodology for investigating cross-language similarity and its role in perception by examining Korean acquirers of English, and we use this methodology to determine how the neutralization of Korean obstruent contrasts in post-vocalic position affects Korean's perception of English obstruents in pre- and post-vocalic position. Following Lim 2003 (Indiana University Ph. D. dissertation), we had 20 recently immigrated Korean subjects perform two consonant identification tasks, one with English labels and one with Korean labels. We used the probability of the same Korean label being applied to two English sounds to predict the probability of identification errors in English. For example, both /b/ and /v/ were usually labeled as Korean tense or lax /p/; having L1 mappings in common would predict high confusion rates between /b/ and /v/ in English labeling.

Actual English identification errors correlated well with predicted errors. There were two classes of deviation from the prediction. 1) Stop – fricative errors were consistently fewer than predicted, indicating that the listeners were systematically acquiring a new (English) set of fricative categories. 2) While glottal contrasts were well distinguished in stops as predicted, errors between new categories (e.g. /f/ vs. /v/) were systematically more than predicted, indicating that the glottal contrasts in the new fricative categories were not based on old (Korean tense/lax & aspirated) contrasts. A general pattern appears: the listeners showed increased English skills distinguishing new from old segments, and decreased skills distinguishing new segments from each other. One systematic exception to this pattern appeared: glottal contrasts (e.g. /p/ vs. /b/) in post-vocalic position were consistently worse than predicted from Korean labeling, even though one of the segments corresponds to an L1 segment. This exception appears to be due to the active influence of a coda neutralization effect that makes the neutralized contrast harder to acquire. Thus, cross-language perception indicates the importance of cross-segment generalizations in L2 acquisition.