

Phonetic Category Revision in Early L2 German Dorsal Fricatives: From Naïve Listener to Beginning Learner

John H. G. Scott & Isabelle Darcy
Indiana University, Department of Second Language Studies

This study investigates L2 acquisition of the voiceless palatal and velar fricatives [ç] and [x], which are not phonemes in most English varieties. Using the perceptual assimilation (PA; [1]) experimental paradigm, this study compares two groups of L1 English speakers: naïve listeners with no L2 German exposure (NoG; $N=20$) and L2 learners at the end of their first semester of introductory college German (BegG; $N=27$). In contrast with most PA studies, which control for prosodic position in their stimuli, this study uses syllable position as an independent variable with three conditions: $\underline{\text{CVC}}$ -initial, $\text{CVC}\underline{\text{C}}$ -final, and $\text{CVC}\underline{[t]}$ -penultimate.

480 randomized monosyllabic stimuli containing the German consonants [ç x h k ʃ] were balanced for vowel ([a] vs. [ɛ]) and presented in blocks by prosodic position of the target consonant in the three syllable frames. In each target position, participants chose the best fit from 20 alphabetically arranged English consonant category response options (e.g., “*h* as in *hay*”, “*k* as in *kite*”, “*sh* as in *shoe*”) and rated the target sound on a 7-point goodness-of-fit (GF) scale (1 = “very bad example”; 7 = “very good example”). Raw frequency of responses and GF ratings were integrated into weighted proportions [3], and overlap scores between German consonant conditions were also examined [2].

BegG group data were collected with a mouse click version of the task in a laboratory, whereas NoG group data collection was conducted in the field with laptop and touchscreen format. Due to low touchscreen resolution, graphically adjacent response types were grouped in the analysis to allow comparison with data from the mouse click version. The NoG group results were compared with those from a naïve listener group in a previous study to avoid confusion of task effects with reliable characteristics of the initial state.

Results for German [x] and [ç] conditions were considered globally, by syllable position, and between groups. For example, mapping of initial German [x] to <h> essentially did not vary between NoG and BegG groups. For German [ç], the NoG group split mappings between <h> and <sh>, whereas the BegG group shifted from <sh> to <h> locally. The BegG group shifted mapping of [ç] from [ʃ] to [h] and initial [x] shifted from [h] to <r>. Penultimate and final positions showed influences on codas (prosodic) and on complex codas (phonotactic). The BegG group mapped dorsal fricatives more to <k> and <ch> in coda positions, indicating a fundamental difference from the NoG group. These results indicate the importance of position-sensitivity and reveal shifts in mapping patterns even in early L2 exposure.

[1] Best, C. T. (1995). A direct realist view of cross-language speech perception. In W. Strange (Ed.), *Speech perception and linguistic experience. Issues in cross-language research* (pp. 171–204). Timonium, MD: York Press.

[2] Guion, S. G., Flege, J. E., Akahane-Yamada, R., & Pruitt, J. C. (2000). An investigation of current models of second language speech perception: The case of Japanese adults' perception of English consonants. *Journal of the Acoustical Society of America*, 107, 2711–2724.

[3] Park, H., & de Jong, K. J. (2008). Perceptual category mapping between English and Korean prevocalic obstruents: Evidence from mapping effects in second language identification skills. *Journal of Phonetics*, 36, 704–723.