

What native language can and cannot do: perception of onset consonant clusters

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Cross-language research on consonant cluster production has shown that consonant clusters in different languages are produced with different degrees of articulatory timing lag. For instance, German consonant clusters are produced with relatively shorter lag between two consonants than Georgian ones [1, 2]. This study examines perceptual sensitivity to these cross-linguistic timing differences in consonant clusters. Native listeners of Georgian, German, French, and Japanese are tested on an AXB similarity judgment test using stimuli including consonant clusters produced by German and Georgian speakers. Stimuli are /bla, gla, gna/ syllables recorded along with articulatory (EMA) data. Short lag German tokens and long lag Georgian tokens are selected as A and B, with Xs of varying degrees of lag chosen from either Georgian or German recordings. Results show that all four groups of listeners are sensitive to the cross-linguistic differences in articulatory timing lag: when the timing lag of X is closer to A (or B), participants are more likely to choose A (or B, respectively). [Georgian: $\beta = 0.69$, $p < 0.001$; German: $\beta = 0.74$, $p < 0.001$; French: $\beta = 0.44$, $p < 0.001$, Japanese: $\beta = 0.48$, $p < 0.01$]. This finding suggests that adult listeners are capable of discerning non-native sub-phonemic details regardless of their native phonotactics. Effects of sub-phonemic details on similarity judgments by the four listener groups are investigated. These include different measures of articulatory lags and acoustic properties that are known to be related to inter-gestural timing within clusters (e.g., duration of vocalic release). Implications of possible task effects will be discussed.

References:

- [1] Bombien, L., Mooshammer, C. & Hoole, P. 2013. Articulatory coordination in word-initial clusters of German. *Journal of Phonetics*, 41, 546-561.
- [2] Chitoran, I., Goldstein, L. & Byrd, D. 2002. Gestural overlap and recoverability: Articulatory evidence from Georgian. In C. Gussenhoven, T. Rietveld, and N. Warner (eds.) *Laboratory Phonology 7*. Berlin: Mouton de Gruyter. 419-447.