

# THE EFFECT OF L1 PERCEPTION ON THE DISCRIMINATION OF NONNATIVE VOWEL CONTRASTS: INDIVIDUAL DIFFERENCES

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## HYPOTHESIS >

Compact L1 phonetic categories give an initial advantage in distinguishing non-native contrasts.

## INTRODUCTION >

Native (L1) phonetic categories function as a filter that removes specific acoustic cues for non-native sounds and cause a **perceptual accent** [1, 2]. Yet, some individuals are remarkably successful at perceiving non-native LO sounds [3]. Whereas L1 background has been the focus of much research to explain such variability, little attention has been paid to the role of **individual differences within the same L1**. We argue that not only individuals with various L1s are equipped differently for the task of non-native perception, but also individuals with the same L1 vary in how their native categories are represented in perceptual space. Such variability is observable in measures of **compactness of L1 phonetic categories** [4], and its effects on non-native perception can be assessed by relating the degree of compactness to **the perceived dissimilarity between novel contrasting sounds**.

## REFERENCES >

[1] Best, C. T., & Tyler, M. D. (2007). Non-native and second-language speech perception: Commonalities and complementarities. In M. J. Munro & O.-S Bohn (Eds.), *Second language speech learning: The role of language experience in speech perception and production* (pp. 13-34). Amsterdam: John Benjamins. [2] Flege, J. E. (1995). Second language speech learning: Theory, findings, and problems. In W. Strange (Ed.), *Speech perception and linguistic experience: Issues in cross-language research* (pp. 233-277). Baltimore, MA: York Press. [3] Bongaerts, T., Planken, B., & Schils, E. (1995). Can late starters attain a native accent in a foreign language? A test of the critical period hypothesis. *The age factor in second language acquisition*, 30-50. [4] Kartushina, N., & Frauenfelder, U. H. (2014). On the effects of L2 perception and of individual differences in L1 production on L2 pronunciation. *Frontiers in Psychology*, 5, 1246.

## METHODS >

- **L1 category compactness:** a goodness rating task. Spanish participants listened to synthesized variants of the L1 vowel /i/ (different in F1, F2 or both) and rated them as either good or bad exemplars of their representation of /i/ (Fg1).
- **Perception of novel LO sounds:** a rated dissimilarity task. Spanish participants listened to a novel Russian contrast /i - i/ and rated the perceived psychoacoustic distance between the sounds.

## RESULTS >

L1-based individual differences in perception are small. Yet, **compactness of the native category** contributes significantly to the participants' ability **to perceive the psychoacoustic distance between two novel sounds** (Fg2). Having more compact vowel categories in L1 might facilitate the process of category formation for unfamiliar sounds.

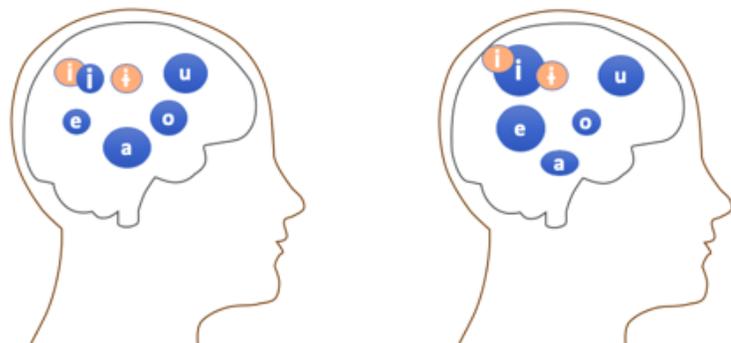


Figure 2. The compactness of L1 vowel categories (in blue) affects the perception of a novel contrast (in pink). The individual on the left is more likely to perceive the difference between non-native /i/ and /i/ than an individual on the right.

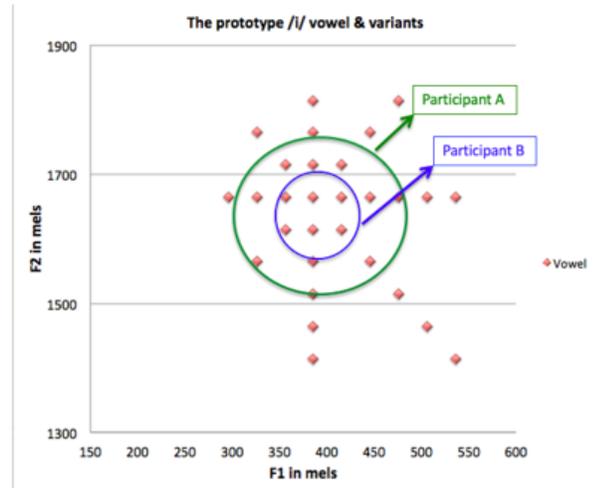


Figure 1. A goodness rating task. The 28 synthesized vowels that are distributed overall a mel-scaled F1\*F2 psychoacoustic space with a prototype /i/ in the center. First, count the number of variants consistently selected as good exemplars of a native category. Second, multiply this number by the values assigned to each variant (based on the distance from a prototype).