

Learning Functional Importance in the L2: Effects of Functional Load on Non-native Contrast Perception.

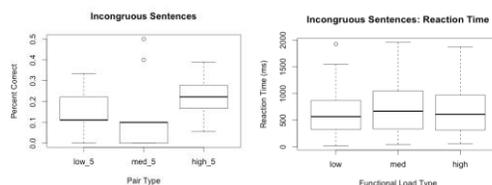
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This study examines L2 speakers' perception of phonological contrasts that specifically vary in terms of their functional importance in the L2. Past research has shown that L2 speakers face a number of difficulties when perceiving sound contrasts that are not present in their native L1 (e.g., Werker and Tees 1984, Lin et al. 2004, Mayo et al. 2007). But, among sound contrasts that are not native in the L1, it is unknown whether there are differences in perceptual difficulty of these phonological contrasts based on the functional importance in the L2. It is known that not all contrasts are weighted equally in a given language (e.g., Boomershine et al. 2008, Hall 2009). Research examining the relevance of functional load—the amount of “work” a sound pair does to distinguish meaning in a language (Hockett 1966), often quantified as the number of minimal pairs that hinge on a particular contrast—has been used to examine how speakers perceive differences in phonological contrasts. These differences have been demonstrated to be correlated with perception, such that pairs of sounds that are more contrastive are more perceptually salient than pairs that are less contrastive (e.g., Munro and Derwing 2006, Kang and Moran 2014, Stevenson, 2015).

The current study looks at the interplay of these two factors—L2 speakers and the perception of contrasts that vary in terms of their functional load—to investigate how a specific language group, Mandarin ESL speakers, perceives three pairs of voiced obstruents with varying levels of functional load in English (low, medium, high), none of which occur in their native language. The pairs were matched phonetically so that each pair had a voiced stop and a voiced fricative, to minimize effects of acoustics. Participants listened to randomized pairs of sentences embedded in +4db SNR of white noise, with the last word of each sentence as one member of a minimal pair: a highly predictable right word, as in (1a) or the same sentence with the wrong (minimal pair) word (1b); it is the incongruous sentences in (1b) that provide information about the perception of the contrast.

- (a) On rainy days, it can be fun to splash in a puddle.
(b) *On rainy days, it can be fun to splash in a puzzle.

Participants were asked to determine if the last word in each sentence was right or wrong. Reaction times and accuracy were analyzed to determine how well participants were able to distinguish between sounds pairs with varying levels of functional load. Pilot results from nine native Mandarin speakers (shown below) suggest that the high-functional load pair was indeed perceived most accurately (mean = 22.4% correct), though the medium and low pairs were approximately the same (~14% correct each), but that there are no differences in reaction times. The presented paper will present results from a larger group of participants and discuss why there might be a simple binary distinction between high / non-high functional loads instead of a gradient one.



References:

- Boomershine, Hall, Hume, and Johnson. 2008. The influence of allophony vs. contrast on perception: The case of Spanish and English. In *Contrast in phonology: Perception and acquisition*, ed. Peter Avery, B. Elan Dresher and Keren Rice, 145-171. Berlin: Mouton.
- Hall, Kathleen. 2009. A probabilistic model of phonological relationships from contrast to allophony. Doctoral dissertation, The Ohio State University.
- Hockett, Charles F. 1966. The quantification of functional load: A linguistic problem. U.S. Air Force Memorandum RM-5168-PR.
- Kang, O. and Moran, M. 2014. Functional Loads of Pronunciation Features in Nonnative Speakers' Oral Assessment. *Tesol Quarterly*, 48(1), 176-187.
- Munro, M. J., and Derwing, T. M. 2006. The functional load principle in ESL pronunciation instruction: An exploratory study. *System*, 34, 520-531.
- Lin, H., Chang, H., and Cheung, H. 2004. The Effects of Early English Learning on Auditory Perception of English Minimal Pairs by Taiwan University Students. *Journal of Psycholinguistic Research*, 33, 25-49.
- Mayo, L., Florentine, M., and Buus, S. 2007. Age of second-language acquisition and perception of speech in noise. *Journal of Speech, Language, and Hearing Research* [H.W. Wilson - EDUC], 40, 686.
- Stevenson, Sophia. 2015. The strength of Segmental Contrasts: A Study on Laurentian French. Doctoral Dissertation, University of Ottawa.
- Werker, J. and Tees, R. 1984. Cross-language speech perception: Evidence for perceptual reorganization during the first year of life. *Infant Behavior and Development*, 7, 49-63.