

Center for Cognitive Science

University at Buffalo, State University of New York

Wednesday, November 2, 2005

280 Park Hall
North Campus
2:00 pm –4:00 pm

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"Effects of linguistics experience on early levels of tone perception"

This study investigated the phenomenon of language-specificity in Mandarin Chinese tone perception. The main question was whether linguistic experience affects the earliest levels of perceptual processing of tones. Chinese and American English listeners participated in four perception experiments, which involved short inter-stimulus intervals (300ms or 100ms) and an AX discrimination or AX degree-of-difference rating task. Three experiments used natural speech monosyllabic tone stimuli and one experiment used time-varying sinusoidal simulations of Mandarin tones. AE listeners showed psychoacoustic listening in all experiments, paying much attention to onset and offset pitch. Chinese listeners showed language-specific patterns in all experiments to various degrees, where tonal neutralization rules reduced the perceptual distance between two otherwise contrastive tones for Chinese listeners. Since these experiments employed procedures hypothesized to tap the auditory trace mode, language-specificity found in this study seems to support the proposal of an auditory cortical map (Guenther et al. 1999). But the model needs refining to account for different degrees of language-specificity, which are better handled by Johnson's (2004) lexical distance model, although the latter model is too rigid in assuming that linguistic experience does not affect low-level perceptual tasks such as AX discrimination with short ISIs.

1. Selected References Guenther, Frank H., Ratima T. Husain, Michael A. Cohen & Barbara G. Shinn-Cunningham, 1999. Effects of Categorical and Discrimination Training on Auditory Perceptual Space. In *Journal of the Acoustical Society of America*, 23(4), pp. 213-221.
2. Johnson, Keith, 2004. Cross-linguistic perceptual differences emerge from the lexicon. In Augustine Agwuele, Willis Warren, and Sang-Hoon Park (eds.) *Proceedings of the 2003 Texas Linguistics Society Conference: Coarticulation in Speech Production and Perception*. Sommerville, MA: Cascadilla Press. pp. 26-41.

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