

International Conference on

Speech Language Pathology

May 22-23, 2017 Las Vegas, USA

The internal models of pitch in tone speakers and adult second language learners: Evidence from sensorimotor responses in the pitch-shift paradigm

Li-Hsin Ning

National Taiwan Normal University, Taiwan

Adult second language learners of Mandarin have to acquire new perceptual categories for discriminating and identifying lexical pitch variation of lexical tones, along with new sensorimotor skills to produce the rapid tone changes. Pitch-shift paradigm in which a short and artificial change in pitch is fed back to speakers during vocalization has been used to investigate how sensory information affects the way we control our speech motor activities. The pitch-shift response (i.e., vocal responses to auditory perturbation, PSR for short) is a reflex-like auditory-vocal response elicited by artificial shifts in auditory feedback. Speakers typically respond to the pitch stimulus by shifting the fundamental frequency (F0) of their voice in a compensatory direction. The pitch-shift paradigm can also be used to understand the stability of internal models for tone production. Controversy exists in the literature regarding whether this rapid response can be volitionally suppressed, which would suggest speakers can modulate the reflex-like aspects and reduce short-term pitch fluctuations. My previous research suggests that native Mandarin speakers demonstrate reduced PSR gain when producing Mandarin tones and even non-linguistic vowel vocalizations relative to native English speakers. The results suggest that Mandarin speakers have more stable internal models for tones, as their ability to control F0 is in general (in both linguistic and nonlinguistic domains) superior to native English speakers. The L2 learners bear some resemblance to Mandarin speakers in terms of PSR suppression. However, they may require more learning in order to reshape their internal models and make them more native-like. Trained vocalists reduced PSR gain compared to non-musicians. However, although trained vocalists have the potential to produce tonal contours, regulation of voice F0 in a linguistic domain may still require intensive tone training. On the other hand, online visual F0 feedback on the magnitude and timing of the PSR could facilitate suppression of the PSR. The results show that augmenting F0 feedback via online visual monitoring contributes to suppression of the PSR in both Mandarin and English speakers. Apparently, the auditory-vocal integration system of the human brain can be modified rapidly to suppress F0 fluctuations in comparison with typical auditory feedback conditions. Visual F0 feedback offers opportunities for pitch control that may have application to musical training and language learning.

Biography

Li-Hsin Ning has received her PhD in Linguistics at the University of Illinois at Urbana-Champaign. She formerly worked at Google as a Speech Data Evaluator and currently is an Assistant Professor in the Department of English (Linguistics Track) at National Taiwan Normal University. She has her expertise in phonetics and psycholinguistics. Her research primarily investigates the internal models for tone in native speakers of Mandarin and second language learners of Mandarin. She used the pitch-shift paradigm to examine the reflex-like responses represented by point estimation and F0 contours. She is additionally interested in speech technology (such as speech recognition) and sentence processing (both in the behavioral level and the neurophysiological level).

lihsin@ntnu.edu.tw

Notes: