Universal and Language-Specific Experience in the Perception of Thai Lexical Tone

Denis Burnham[a], *Amanda Reid*[a], *Benjawan Kasisopa*[a]
[a]*MARCS Institute, University of Western Sydney*

Tone vs. non-tone language experience, and experience with particular tone inventories is known to shape perception of lexical tones. We present 2 experiments on the perception of Thai tones by tone language speakers (Thai, Cantonese, Mandarin), a pitch accent (Swedish), and a non-tonal (English) Language. In each word pairs differing only on tone were presented for classification as 'same' or 'different'.

Experiment 1 investigated Auditory-Only (AO), Visual (Face)-Only (VO) and Auditory-Visual (AV) tone perception with or without acoustic noise. In noise there was augmentation by visual information (AV>AO) in all 5 language groups, showing that visual information for tone exists and can be used even in the absence of tone language experience. AO and AV tone perception was best for native Thai, then non-native tone, then pitch accent then non-tone language speakers. VO tone perception showed the opposite– non-tone language speakers were better than tone or pitch accent language speakers, suggesting that (i) visual tone information is available but not used by tone language speakers, and (ii) visual information for tone may be useful for tone language adults with Hearing Impairment or children with language impairments.

Experiment 2 focused on *processes* in cross-language tone perception. Perceptual discrimination of tones was examined in 3 F0-equivalent auditory contexts*:* speech, filtered speech, and violin sounds, with phonetic vs phonemic) processing manipulated via inter-stimulus interval (500ms vs 1500ms). As in Experiment 1, there was an effect of language experience. In addition, tone (Thai, Cantonese) and pitch-accent (Swedish) language participants showed equivalent discrimination across all 3 contexts but non-tone language (English) listeners had significantly better discrimination for violin than for filtered speech, and in turn, for speech. Moreover, tone and pitch-accent listeners' processing speed was facilitated at the phonemic (ISI = 1500ms) level of processing.

Together results show there is a range of information available for tone perception including visual (face) information, and acoustic, phonetic and phonemic information; and that language background determines how this information is used –AV by speakers from all language backgrounds, VO by non-tone language perceivers, and linguistic phonemic information by native and non-native tone and pitch-accent language speakers. Tone perception is determined by both universal and experiential factors