

Speech-to-song Illusion: Acoustic Properties vs. Perception

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In this project, I use evidences from Mandarin Chinese to test the underlying mechanism of the speech-to-song illusion. Deutsch and co-workers (Deutsch 1995, Deutsch et al. 2008) observed that a spoken English sentence can be heard as singing by only repeating the sound signal a few times over, without changing any aspect of the sound signal whatsoever. In subsequent experiments, Falk and Rathcke's work on German (2010) showed that this effect is not universal. Contrary to Deutsch, they proposed that the rhythmic-metrical and tonal characters of the sample sentence are crucial factors in such processes. In my previous research (Zhang 2010) I discussed the role of target stability and interval structure in generating the illusion in Mandarin Chinese, a tone language.

By drawing from research in speech production & perception and speech synthesis, the current project seeks to (1) theoretically demonstrate the implications of studying speech-to-song illusion in the understanding of the diverging points the perception of speech and song signals;(2) using perceptual experiments to determine the acoustic properties of speech-to-song illusion signals in MC tone 1 and tone 3, including target duration, target speed of pitch change, pitch range, and pitch register.

Recorded speech signals (with computer manipulation and re-synthesis) are used as stimuli and played back in groups of 10 times to test the illusion. For each experiment, 10 Mandarin native speakers are recruited to hear the stimuli through a headphone and mark their judgments on a computer interface.

This is an on-going research. Experiments will be conducted at Department of Music, University of Pittsburgh, and the Phonetics Lab, Institute of Linguistics, China Academy of Social Sciences in Beijing.

Reference

Falk, Simon; Rathcke, Tamara. "On the Speech-To-Song Illusion: Evidence from German." Paper presented at the 5th International Conference on Speech Prosody, Chicago, IL,2010.

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