CFA/VISHNO 2016

Auditory Perceptual Learning in Time Domain for Cochlear Implant Users

H. Kang[a], O. Macherey[b], S. Roman[c] et D. Pressnitzer[a]
[a]Laboratoire des systèmes perceptifs (UMR 8248), 29 rue d'Ulm, 75005 Paris, France
[b]Laboratoire de Mécanique et d'Acoustique, CNRS - UPR 7051, 4 impasse Nikola Tesla CS 40006, 13453 Marseille Cedex 13, France
[c]Dept. of Pediatric Otolaryngology and Neck Surgery, Aix-Marseille Univ., 13385 Marseille, France
hijee.kang@ens.fr

CFA2016/206
Auditory Perceptual Learning in Time Domain for Cochlear Implant Users

H. Kang[a], O. Macherey[b], S. Roman[c] et D. Pressnitzer[a]
[a]Laboratoire des systèmes perceptifs (UMR 8248), 29 rue d'Ulm, 75005 Paris, France
[b]Laboratoire de Mécanique et d'Acoustique, CNRS - UPR 7051, 4 impasse Nikola Tesla CS 40006, 13453 Marseille Cedex 13, France
[c]Dept. of Pediatric Otolaryngology and Neck Surgery, Aix-Marseille Univ., 13385 Marseille, France
hijee.kang@ens.fr

People understand sensory patterns from complex daily scenes by recognizing relevant information they may have encountered in the past. In the auditory modality, fast and robust perceptual learning has evidenced, using random auditory stimuli in normal hearing listeners (Agus et al., 2010; Kang et al., 2015). The learning processes may be impacted for cochlear implant (CI) users, as they receive limited acoustic cues. CI users have mostly access to temporal cues whereas normal hearing listeners may use both spectral and temporal cues to perceive and learn sounds. The present study uses stimuli focused on time-domain cues to understand the learning process in a group of Med-EL CI listeners. Electrical pulse trains with Poisson-distributed random time intervals between pulses are used as stimuli, with a test design adapted from a previous study (Kang et al., 2015). Pulse trains are presented either as a series of random time intervals for 2 sec. (Random pulse train, C) or as a 1-sec. random series immediately repeated for another 1 sec. (Repeated pulse train, RC). Whilst both C and RC are generated afresh for each trial, one specific RC (Reference repeated pulse train, RefRC) re-occurs several times within a test block. Without informing the presence of RefRC, listeners are simply asked to distinguish a within-trial repetition. In the first condition, the same pulse sequence is transmitted quasi-simultaneously to a subset of electrodes, therefore conveying within-channel temporal information. In the second condition, different pulse sequences are transmitted to each electrode, thereby conveying additional across-electrode temporal information. The results should clarify the impact of a CI on auditory perceptual learning, and further specify the relative roles of within-electrode and across-electrode information for the CI population. Ref.: Agus et al. (2010). Neuron, 66, 610-618; Kang et al. (2015). 38th MidWinter Meeting of the ARO, p. 536. Baltimore, USA.