

CONTROL ID: 2904898

TITLE: Vision-induced reweighting of binaural localization cues

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ABSTRACT BODY:

Abstract (200 words): Normal-hearing listeners apply frequency-dependent weights when combining the two binaural cues (interaural time and level difference, ITD and ILD) to determine the perceived sound source azimuth. Cochlear-implant (CI) listeners, however, rely almost entirely on ILDs. Since current CI systems do not reliably convey ITD information, CI listeners might learn to ignore ITDs and focus on ILDs instead. We investigated whether this reweighting of binaural cues is generally possible. 20 normal-hearing participants, assigned to two groups, completed an experiment in a virtual audio-visual environment. The experiment consisted of a pre-test to establish the initial ITD/ILD weights, a seven-day training, in which visual feedback reinforced one of the cues, and a post-test to measure the effect of training on the weights. Participants' task was to lateralize octave-wide bands of noise (centered at 2.8 kHz) containing various combinations of spatially inconsistent ITD and ILD. In both groups, the lateralization bias related to the reinforced cue declined significantly from pre- to post-test, suggesting that participants reweighted the binaural cues in accordance with the visual feedback. These results are promising in terms of making ITD information usable by CI listeners once it is conveyed by the implants. [Support: SpaCI Danube Partnership project, H2020-MSCA-RISE-2015 #691229]

CURRENT TECHNICAL COMMITTEE: Psychological and Physiological Acoustics

CURRENT SPECIAL SESSION. IF NOT SUBMITTING TO A SPECIAL SESSION, CHOOSE "NONE SELECTED.":

None Selected

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Author Disclosure 1: Yes

Author Disclosures 2: Yes

Ethical Principles: I have complied with the ASA Ethical Principles.

Session Broadcast : I am interested in having this paper's presentation broadcast live in real-time over the internet, and recorded for later dissemination.

Additional Comments: (none)

PACS Numbers: 43.66.Pn