Auditory Training to Increase Spatial Hearing in Aided Hearing Impaired Listeners
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Purpose: The purpose of this research project is to examine whether auditory training can increase spatial hearing in aided hearing-impaired listeners.

Methods: The participants tested consisted of twelve college age students with normal audiometric thresholds. To examine the effects of systematic training on spatial release from masking, our protocol followed a test-test-train-test procedure conducted in a consecutive three-day time frame. The test stimuli consisted of pre-recorded BKB-SIN sentences, which were phonetically equal. The sentences contained target words and the participants were scored on the number of target words that they identified correctly. The training protocol consisted of five phases that promoted spatial learning. Within each phase, the participant completed modified tasks that gradually increased in complexity. In phase two, the participant received feedback for incorrect responses and the stimuli that were not repeated correctly were replayed to facilitate the learning process. Information gathered from both the tests and training was recorded using scoring sheets. This information was transferred to the computer database for further analysis.

Results: The overall performance was assessed using speech reception thresholds (SRTs). The SRT quantifies speech perception as a behavioral outcome, and is defined as the speech-to-noise ratio required to obtain 50% speech intelligibility in a listening task. The mean SRT values across both ears after session one (Test 1) was 5.5 dB. The second session and second test (Test 2) indicated a small decrease in SRT in the range of 1-2 dB. The drop in SRT indicated procedural learning that occurs between Test 1 and Test 2. Session 3 (Test 3) took place after training was completed. We found that the SRT in both ears decreased. The SRT in the co-located condition did not change.

Conclusions: The SRTs for the S0N+90 and S0N-90 conditions were lower (better) after each testing session (1st and 2nd), meaning that the participants ability to understand speech in noise improved. The participants' SRM averaged 5 dB in the first two testing sessions before training (see Test 1 and Test 2). After the training session, the participants showed a statistical significant increase of around +3 dB in SRM as indicated in Test 3. The next step is to test bilateral cochlear implant users and assess their spatial learning.