INTRODUCTION

Factors contributing to variable sound localization performance in bilateral cochlear implant users
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METHODS

Stimuli
- Train of four pink noise bursts, 170 ms each
- Inter-stimulus-interval (ISI) = 50 ms
- Signal presented at 50 dBa ± 4 dB SPL level rove
- ± 10 dB spectrum rove
- Stimuli were randomly presented from each of the 19 speaker locations 15 times. A total of 285 trials were obtained per subject.

Task
- Participants listened to stimuli in the free field through their clinical speech processors and indicated on a graphical user interface the perceived location of the signal.

Analysis
- Two metrics were calculated to estimate sound localization ability
  1. Root-mean-square (RMS) localization error
  - Evaluates sound localization precision
  2. Angle at which d prime (d') equals 1
  - Localization responses were linearized by applying an arc sine transformation; then d' was calculated for each left/right location of the same angular value. A line, constrained to pass through zero, was fitted to the d' values and the angular discriminability was estimated as the point where d' = 1.
  - Responses were analyzed from -50° to 50°.

RESULTS

CONCLUSIONS

Factors related to hearing history do not appear to account for the variability in either of the metrics used to assess sound localization ability in this study.

This suggests that other factors – such as individual differences in the placement of electrodes, hearing aid use, processor type, and the extent of neural degradation – might account for the observed variability.