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Effect of hearing aids on distance perception

Michael Akeroyd

MRC Institute of Hearing Research, Glasgow Royal Infirmary, 16 Alexandra Parade, G31 2ER Glasgow, UK

The two primary auditory cues to distance in rooms are the overall level of the sounds received by the listener and the ratio of the level of the direct sound to the reverberant sounds. In previous work we have demonstrated that hearing-impaired listeners showed no overall deficits in the ability to use the overall-level cue, but they did have deficits in the ability to use the direct-to-reverberant cue [M. Akeroyd, S. Gatehouse, and J. Blaschke, *J. Acoust. Soc. Am.*, 121, 1077-1089 (2007)]. These deficits would be expected to contribute to the auditory disability suffered by the listeners. But both of these auditory cues are level cues, as they require some measurement of intensity, and so they would be expected to be affected adversely by the amplitude compression found in most modern hearing aids. Initial results from an experiment measuring the just-noticeable difference (JND) for changes in distance (at 2 m and 5 m) with experienced hearing-aid users suggest, however, that their JNDs are no different to those of unaided but impaired listeners. If confirmed by the final results, this surprising result may be interpretable if listeners have acclimatized to the effects of their aids on level.