Editorial

Hearing Aids and Background Noise

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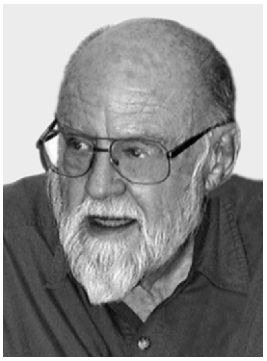

People who design tests to assess a hearing aid user's ability to understand speech in the presence of background noise go to great lengths to define the level of the noise and to be sure that the level remains relatively constant over time. Substantial intensity variations or lacunae of silence in the background noise are regarded as inconsistent with sound psychoacoustic principles. They recommend, further, that the tests be administered in an acoustically controlled, relatively reverberation-free environment: thus the actual test environment is usually a small, poorly lit chamber with exceedingly absorbent steel walls, floor, and ceiling. It is perhaps not inappropriate to question whether all this may be violating some fundamental aspects of ecological validity.

Proponents of the latter would argue that, if you want to assess how well a hearing aid user understands speech in the presence of constant, unwavering background noise while listening in a small, dimly lit chamber with exceedingly absorbent steel walls, floor, and ceiling, then that is the way to carry out the test. But if you want to assess how well a hearing aid user understands speech in the presence of background noise in real life, you need to make an effort to re-create, in the test situation, the variation in level and temporal discontinuity of the background noise that the user encounters in the real world.

In this issue of *JAAA* authors Kirsten Wagener and Martin Hansen, of Germany, and Carl Ludvigsen, of Denmark, report results of a study bearing directly on this issue. The article "Recording and Classification of the Acoustic Environment of Hearing Aid Users" contains a wealth of data on what users actually encounter in daily living. Twenty experienced hearing aid users were fitted with recording devices and sent out to record the sounds they actually encountered as they got on with their lives. Next they answered several questions from the Glasgow Hearing Aid Benefit Profile questionnaire concerning the noises they had recorded. Finally, the subjective assessments were compared with the acoustic analysis of the recordings.

There is something for everyone in these data. There is, first, an exhaustive acoustic description of commonly encountered noise levels in a real environment; second, a summary of the interactions between the noises and the hearing aid users; third, quantification of the extreme variability likely to be encountered, both among users and across noises in real-life listening; and, fourth, the prevalence and importance of nonspeech sounds in daily living. All of this leads the authors to the very reasonable conclusion that "along with a nonlinear hearing aid fitting, further signal classification and signal/situation-adaptive features are highly desirable inside a modern hearing aid. However, when assessing their benefit for the hearing aid user in the clinic, it seems appropriate to use a number of different types of signals and noises." Another finding that brought tears to the eyes of this lover of classical music, whose ears have long been tortured by the cacophonies preferred by young people, is the authors' observation, from their acoustic analyses, that "music could be classified as either speech or noise—or as changing back and forth between these two, depending on the genre of the music."

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