Editorial

Right-Left Asymmetries

In this issue of JAAA, Tori Gustafson and Teri Hamill add another set of data to a growing array of evidence suggesting subtle asymmetries in the binaural auditory system. Subjects with simulated unilateral conductive hearing loss, created by insertion of an earplug, were seated in a sound-treated chamber before a semicircular array of 13 loudspeakers. Then, 3000-Hz warble tones of 1-second duration were presented randomly from different speakers. Subjects indicated the number of the loudspeaker from which the warble tone seemed to be coming. Results showed that localization errors were significantly greater when the right ear was plugged than when the left ear was plugged.

These results are consistent with previous findings by Bess, Tharpe, and Gibler who noted, more than 8 years ago, a similar interaural difference in sound localization ability in subjects with unilateral sensorineural hearing loss. Apparently, the imbalance created by attenuation of input from the right side affects localization ability more than the imbalance created by attenuation of left-sided input.

We are all, of course, well acquainted with the right-ear advantage when verbal materials are presented dichotically, but there seems to be a growing body of evidence suggesting a more general asymmetry, not necessarily limited to specific listening paradigms. Recent work on noise-induced loss suggests, for example, that the left ear sustains more loss than the right ear, even after all laterality factors have been controlled. Whether this is a peripheral or central effect, or some combination of the two, remains to be determined. In the meantime, there are some practical implications for researchers. Clinicians quickly learn that test results can be quite different on the two ears of a person with auditory disorder, even when there is little difference in audiometric levels, and, indeed, even when audiometric levels are within normal limits. Hence, good clinical practice dictates, for example, that testing of aided response be carried out in all possible conditions (e.g., right-ear aided, left-ear aided, both ears aided). But many researchers have tended to ignore the possibility that the two ears might not yield equivalent results.

It is the case, for example, that much of the world's literature on auditory event-related potentials is based on binaural, diotic signal presentation, although monaural testing might reveal significant interaural asymmetries.

In many research areas concerned with monaural effects, it is, of course, good practice to limit data to one ear per subject in order to avoid the dependency issue. But it may be hazardous to limit data collection to all right ears or all left ears, as some investigators have done. Better practice would be to select the test ear at random with the constraint that the number of right and left ears tested be approximately equal, then compare results from the two ears before collapsing data. An even better approach, time permitting, is to test both ears, and consider “ear” to be one of the variables of interest in data analysis.

The work of Gustafson and Hamill should remind us that we can no longer assume that the two ears are necessarily equivalent, whether for clinical or research purposes.

James Jerger
Editor-in-Chief