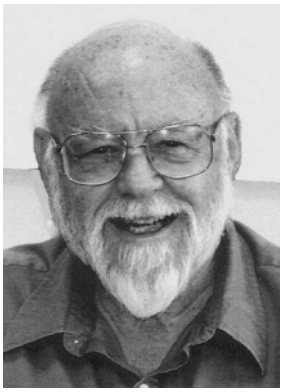
# Editorial

# Dichotic Listening in the Evaluation of APD



Dichotic listening (DL) tests are at the core of the diagnostic evaluation of both children and adults suspected of auditory processing disorder (APD). Tests like SCAN, SSW, Dichotic Digits, and DSI have been used for decades both as screening tools and as diagnostic tests in APD evaluation. Two separate rationales have motivated the use of DL tests.

The first derives from the structural model of dichotic listening first proposed by Doreen Kimura. The model proposes that the right-ear advantage/left-ear disadvantage in dichotic listening is based on the essentially hard-wired connections among the two ears, the crossed and uncrossed auditory pathways, the specialization of the left hemisphere for linguistic processing, and the interhemispheric connections via the corpus callosum. The rationale for the use of DL tests in the evaluation of suspected APD follows from the assumption that disorders of these unique central auditory neural connections may underlie problems in auditory processing. Such a defect would be revealed as an abnormally large left-ear disadvantage on a dichotic task.

The second rationale derives from the fact that auditory processing deficits consequent on known neurological disorders may be revealed on behavioral tests only when the tests have been "sensitized," that is, purposely designed to represent a high level of difficulty. Dichotic listening is one such sensitized test, a paradigm inherently difficult for any listener. Here the argument is that the mere difficulty of the listening task will reveal deficits in auditory processing. The effect may be revealed either as an abnormal left-ear deficit or as poor performance on both ears.

Complicating both of these rationales is the fact that behavioral performance on dichotic tests may be influenced by a number of factors apart from auditory processing per se. They include, but are not limited to, short-term memory, speed of mental processing, allocation of cognitive resources, report strategy, and facility with linguistic materials.

In this issue of the journal, author Jeffrey Martin and colleagues at the University of Texas at Dallas report results of a study in which they attempted to evaluate the extent to which such confounding factors contribute to performance on a series of dichotic tests in children at risk for auditory processing problems. They compared two groups of children on a clinical dichotic listening test. One group showed abnormal performance, generally in the form of a significant left-ear deficit, whereas the other group showed performance within normal limits. Both behavioral and electrophysiological measures were gathered while the children were tested under three conditions: (1) diotically, (2) dichotically with attention directed to one ear, and (3) dichotically with attention divided between ears.

Group differences were more robust in the divided-attention condition than in the directed attention condition. They were revealed in the behavioral accuracy scores and in both the N400 and LPC components of the late ERPs. The authors interpret these results as consistent with a processing disadvantage primarily in the cognitive domain. Specifically, they suggest that children with suspected auditory processing disorder may be unable to allocate attentional resources effectively. This may prevent the separation of competing stimuli spatially, a critical factor enabling the suppression of the irrelevant competing word.

A strong implication of these findings is that dichotic testing should be carried out in both the directed-attention and divided-attention modes in order to differentiate generalized cognitive impairment from specifically auditory processing disorder.

*James Jerger*
*Editor-in-Chief*