Language Proficiency and Lateral Position in the Classroom

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This paper not only makes a contribution to the mosaic of scientific knowledge of the brain and nervous system, but suggests implications of practical value. Observant, experienced teachers know empirically that some youngsters learn best, and perhaps only, when seated front-center, right before the teacher's desk. Such children need to have the eye contact, or to be in quick arm's reach, or to have distractions screened out. Drs. Bakker and Van Rijnsoever give evidence here that, for many children, taking in and remembering the message is dependent on their physical placement to catch most effectively the stream of sound. This is important to consider in the popular open classroom. Although many children can adapt readily to less-than-perfect physical learning conditions, for some we must "re-invent the wall," not to climb, but to provide a place to call "home." The theoretical re-inforcement presented in this paper proves that such boundaries can also provide source and direction for sound as part of some children's currently needed sensory security and enhance the efficiency of their auditory intake.

—Editor

Development of Listening Techniques

Hemispheric asymmetry of function is an important issue in neurology, psychology, and special education. The neurologist may wish to know which hemisphere primarily mediates language in candidates for neuro-surgery. Retarded cerebral lateralization could inform the educational psychologist about the etiology of a reading problem. However, since looking into the black box is not possible one is confined to indirect measures of hemispheric asymmetry. One such measure is hand preference. Orton's well known model of language disability is based on the issue of lagging cerebral dominance which he thought to be reflected in atypical hand preferences. Today we know that hand preference is not the most reliable measure for predicting functional asymmetry of the brain. Some 20 years ago a new instrument was developed to explore hemispheric dominance for lingual and nonlingual functions. Kimura (1961) showed the
usefulness of Broadbent's dichotic listening technique for psychological, neurological, and educational diagnosis. These listening tests provide the subject with different bits of information simultaneously presented to each ear. For instance, the digits 5, 3, 9 can be presented to the right and the digits 2, 6, 1 to the left ear in such a way that the subject hears 5 in his right ear and simultaneously 2 in his left, followed by the pairs 3/6 and 9/1.

Besides digits, meaningful words, nonsense words, consonants and vowels can be used as verbal stimuli in dichotic listening, as well as nonverbal stimuli such as bits of melodies, environmental sounds, and tapped out patterns. Generally right ear advantages are found subsequent to verbal stimulation and left ear advantages following nonverbal stimulation. This is a rule of thumb. Recent evidence indicates that the lateral differences depend not so much on the verbal or nonverbal nature of the stimuli as on the strategies activated to process the information (Bogen 1975; Bever 1975).

In an effort to answer the question of the extent to which auditory asymmetry measures hemispheric asymmetry of function Kimura (1961) related observed ear advantages to the outcomes of unilateral intracarotid sodium amytal injections, viz. the temporary loss of hemispheric functions. For most patients she found right and left ear advantage associated with respectively left and right hemispheric control of speech. It is clear that dichotic listening techniques are valuable tools for examining the nature and development of cerebral asymmetry of function.

It was believed for some time that dichotic stimulation, viz. simultaneous presentation of information to the ears, constitutes a necessary condition to generate ear asymmetry. In case of dichotic stimulation, impulses travel along ipsi- and contralateral pathways since each ear is bilaterally innervated. Rosenzweig (1951) proposed that there is a point of overlap between the two pathways and that at this point the contralateral one, which is functionally stronger, may occlude impulses arriving ipsilaterally.

However, it later became evident that ear asymmetry can be demonstrated subsequent to monaural presentation of information (Bakker 1967; Simon 1967; Bever 1971; Doehring 1972). In monaural listening the ears are stimulated successively; for instance the right ear may be presented a series of digits followed by recall whereupon the left ear is presented a series followed by recall. Since the messages are non-competitive in monaural listening, occlusion mechanisms cannot sufficiently explain the subsequent ear asymmetries. The right ear advantage following monaural presentation of verbal information is most likely due to the contralateral pathway being function-