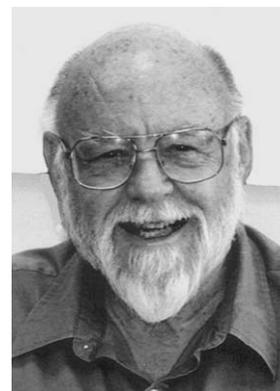


Editorial

The Complexities of Research in Aging



Research designs in the study of auditory aging can take many forms: by far the most common, however, is the comparison of group means. The typical study in auditory aging compares mean performance among groups, for example, young adults with normal hearing, young adults with mild sensorineural loss, elderly persons with mild sensorineural loss, elderly persons with moderate sensorineural losses, and so on. Often lost in such designs, however, is the occasional individual who is not really representative of the group. In group comparisons the assumption is always made, consciously or unconsciously, that each member of the group is representative of the group as a whole and that variation within the group is due either to normally distributed variation in the measure under consideration or to error of measurement.

This may very well hold for young adults with normal hearing, but it does not square with a good deal that has been learned about the effects of aging on auditory function. We know, for example, that, in addition to loss of sensitivity in the high-frequency region, there are age-related changes in central auditory processing and age-related changes in the cognitive dimensions of memory, attention, and speed of mental processing. We know, moreover, that these changes are not necessarily correlated with degree of audiometric loss. Two elderly persons with similar audiograms may differ substantially in a variety of factors impacting performance on auditory measures. Thus, defining an elderly group by its age decade or by its audiometric characteristics does not necessarily guarantee a homogenous group of individuals.

This point is vividly illustrated in the paper “Dichotic Word Recognition in Young and Older

Adults” by Christina Roup of The Ohio State University, Terry Wiley of Arizona State University, and Richard Wilson of the VA Medical Center in Mountain Home, Tennessee. In a study of dichotic word recognition, these investigators tested 18 young males with normal hearing, 18 elderly males in the 60–69 year age decade with sensorineural loss, and 18 elderly males in the 70–79 year age decade, also with sensorineural loss. Three conditions were evaluated: (1) free recall, (2) attention directed first to the right ear, and (3) attention directed first to the left ear.

Not unexpectedly, the group mean for the right-ear advantage for dichotic word recognition was greatest when attention was directed first to the right ear, least when attention was directed first to the left ear, and intermediate in the free-recall condition. Indeed, average performance favored the right ear in the directed-right and free-recall conditions, but favored the left ear in the directed-left condition. And also not unexpectedly, the average interaural asymmetry favoring the right ear was greater in both elderly groups than in the young adult group.

But Roup et al wisely looked beyond the group means and examined the scatterplots of the individual data (see their figure 1). They observed that, although most of the participants reflected the effect of systematic manipulation of attention, from directed right through free recall to directed left, three elderly participants appeared to be exceptions. In these three individuals, the left ear score was severely depressed no matter how attention was manipulated.

Data extracted from their table 3 (see Table 1 below) show the consistency of the substantial left-ear deficit in these three elderly participants in spite of manipulation of attention. In the

Table 1. Data from Three Elderly Listeners (extracted from Roup et al table 3)

	Free Recall RE	Free Recall LE	Attend Right First RE	Attend Right First LE	Attend Left First RE	Attend Left First LE
S1	79%	1%	84%	0%	87%	0%
S2	67%	0%	81%	0%	78%	0%
S3	65%	3%	63%	3%	73%	2%

context of a design comparing group means, these three individuals would be considered “outliers” and might even be discarded. But in terms of understanding the complexity of age-related changes in audition, their data introduce a new dimension. Whereas the right-ear advantage can be systematically manipulated by directing attention in many elderly persons, there appears to be a subset in which a substantial left-ear deficit seems unaffected by such attentional manipulation. Roup et al concluded that, in these three

elderly individuals, the consistently poor left-ear scores may be related to a serious compromise in central auditory processing rather than to an attentional bias.

This study dramatically illustrates the importance of understanding the sources of variability within a group. There may be subsets warranting separate analysis.

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