# Editorial

## Aging: Fact or Fiction?

Why do we lose high-frequency sensitivity as we get older? This question has challenged experimenters and theoreticians since the advent of audiometric measurement. The problem can be considered from at least two perspectives. One suggests that we are programmed to lose sensory elements in the auditory periphery, that it is an inevitable biological consequence of growing old. The other holds that there is no aging effect per se but that we lose sensory elements as a result of years and years of wear and tear on the auditory periphery from the damaging effects of the many environmental insults known to affect auditory structures.

The issue is not easily resolved because of the many interacting and covarying factors involved in any study of the phenomenon. We can never really know, for example, what a given individual's exposure to environmental risk factors has actually been, nor can we always be sure about the accuracy of chronological age estimates, as investigators of primitive peoples quickly learned.

In this issue of *JAAA,* however, authors Wiley, Torre, Cruickshanks, Nondahl, and Tweed, of the University of Wisconsin, present the results of a study, " Hearing Sensitivity in Adults Screened for Selected Risk Factors," in which exposure to environmental agents has been more directly controlled than in previous studies. A popular past approach, for example, has been to compare the audiograms of primitive tribes living in relatively noise-free environments with the audiograms of unselected groups living in the noisier environments of Europe and the United States. The Wisconsin group took a more direct approach. They assembled from their large pool of subjects in the Wisconsin Epidemiology of Hearing Loss Study a group of 355 participants in ages ranging from 48 to 65 years. Every subject in this cohort had been screened, by questionnaire, to rule out a positive history on any of the following risk factors: otologic disorder, noise exposure, cardiovascular disease, ototoxic drug use, smoking, family history of hearing loss, and abnormal middle ear function.

The cohort was then divided into two groups: those in the age range of 48 to 55 years and those in the age range of 56 to 65 years. Now the investigators could ask the question, "Is there any difference in the average hearing sensitivity of the two groups?" Since all subjects have been screened, not just for noise exposure but also for six other risk factors, any difference between the younger and older groups must be attributed to a pure age effect. And that is, indeed, what they found. In both men and women, the average audiogram was significantly poorer in the older group. As expected, the difference increased with frequency, ranging from about 4 dB at 500 Hz to about 12 dB at 8000 Hz. Although these differences are relatively small, they occur over a relatively small age range. They are an elegant demonstration of a residual age effect on auditory sensitivity after known risk factors have been controlled.

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