One of the most important contributions that psychologists have made to audiology is the concept that, in any behavioral task, successful completion of the task requires the allocation of cognitive resources, and that these resources must be drawn from a limited pool. In the case of listening tasks involving linguistic stimuli, either isolated words or sentences, the processes of phonological, semantic, and syntactic analyses require relevant cognitive resources of memory, attention, and speed of mental processing. We have tended to assume, in clinical tests of speech understanding for words and sentences, that these necessary cognitive resources can be readily invoked by the listener. But there is mounting evidence that both aging and hearing loss strain the allocation of these essential cognitive resources in subtle but significant ways.

In this issue of JAAA, investigators Raj Stewart and Arthur Wingfield, of the Volen National Center for Complex Systems at Brandeis University, in their article “Hearing Loss and Cognitive Effort in Older Adults’ Report Accuracy for Verbal Materials,” present an elegant demonstration of the interactions among aging, hearing loss, and linguistic complexity. They tested 48 participants in three groups: young adults, older adults with good hearing, and older adults with mild-to-moderate hearing loss. In each group they measured performance versus intensity functions for words in isolation and for words in sentences in which the syntactic complexity was manipulated by changing from subject-relative to object-relative clause structure.

Results showed that the advantage of sentences over isolated words was greater in both elderly groups than in the young adult group. In addition, the advantage of the syntactically simpler subject-relative clause structure over the syntactically more complex object-relative clause structure was greater in the elderly group with hearing loss. The authors interpret these results to indicate that syntactic complexity imposes a processing challenge to older listeners with relatively normal hearing and that this cognitive challenge is further compounded by the presence of even mild hearing loss.

If we are willing to concede that listening in the real world is more like listening to sentences than listening to isolated words, and that the syntactic complexity of heard sentences may vary, we can begin to understand why performance scores based on lists of isolated words are not always helpful in understanding the listening problems of our elderly clients. Audibility is certainly an important dimension of speech understanding in any individual with hearing loss, but we need to consider as well the additional drain that hearing loss imposes on the already limited cognitive resources of elderly listeners and the extent to which linguistic complexity interacts with hearing loss in real-life listening.

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