Cognitive Capabilities

Today, it is very common to pick up a journal or attend a continuing education session where the topic of dementia and its association with hearing loss is discussed. Harvey Abrams, Ph.D. recently interviewed Kathy Pichora-Fuller, a leading authority on the subject, to see how clinicians may make use of concepts in diagnosis and treatment of patients with hearing difficulty.

**IN (Innovations):** Why do you think there has been so much recent attention devoted to the relationship between auditory and cognitive aging?

**KPF (Kathy Pichora-Fuller):** The population is aging, so audiologists will be seeing older patients and more of them, than ever. By 70 years of age (typical age of first-time hearing aid users), about 1 in 20 will have mild cognitive impairment, and 1 in 10, dementia. People with hearing loss are at even higher risk of cognitive decline (Albers et al., 2015).

**IN:** You often refer to “successful aging” in your writings and presentations. Can you explain that with respect to the role of hearing loss and hearing rehabilitation?

**KPF:** A basic idea about aging is that there are both losses and gains. Successful aging happens when there is a positive balance of gains versus losses. Effective hearing rehabilitation to counteract age-related hearing loss is an excellent way to promote successful aging (Pichora-Fuller, 2014). By helping older adults to maintain good communication and remain socially active, audiologists can help them to stay healthier for longer.

**IN:** You’ve written about the Selective Optimization with Compensation model. How does that model relate to hearing loss?

**KPF:** The Selective Optimization with Compensation (SOC) model (Baltes & Baltes, 1990) provides a framework for successful aging that is highly compatible with hearing rehabilitation. First, individuals select the goals they wish to prioritize. For example, audiologists can help patients identify listening goals by using tools such as the Client-Oriented Scale of Improvement (COSI) (Dillon, Birtles, & Lovegrove, 1999). Then, individual patients optimize by practicing skills to achieve their selected goals, e.g., they might use a hearing aid, do auditory training or learn conversational strategies. They compensate by drawing on other relatively intact abilities to offset declines so that selected goals can be achieved, e.g., vision could be used to lip-read or read captions. The SOC model provides a way to frame hearing rehabilitation in the context of successful aging.

**IN:** What mechanisms might explain the relationship between auditory and cognitive impairment, and could hearing rehabilitation make a difference?

**KPF:** The mechanisms are not yet known; they might be social, cognitive and/or biological (Pichora-Fuller, Mick, & Reed, 2015). Insofar as cognitive declines are associated with social isolation and reduced social participation, hearing rehabilitation could help by maintaining social participation and preventing social isolation. Hearing rehabilitation could also reduce some of the long-term negative consequences of cognitive decline.
overload by making it easier for older adults to process auditory information. If the mechanisms are biological, then it seems unlikely that hearing rehabilitation could alter the course of dementia; however, it could still be advantageous to take the greater risk of dementia in those with hearing loss into consideration (Dupuis et al., 2015).

**IN:** Why is it important that audiologists and other hearing healthcare providers assess the cognitive status of their patients?

**KPF:** For patients who have normal cognition and similar audiograms, cognitive measures (e.g., working memory span) could provide new insights into why some listeners experience more difficulties than others. Such information about individual differences in cognitive processing that affect everyday listening performance could guide recommendations about rehabilitation options. Cognitive measures also offer promise as new outcome measures that could enable audiologists to evaluate if interventions have increased a patient’s ease of listening (e.g., by showing pre- versus post-intervention improvements in a patient’s ability to understand and/or remember more of the words he or she heard). Of course, when planning hearing rehabilitation programs, it is also important to consider the possible influences of many nonauditory factors, including comorbid health conditions such as impairments in vision, dexterity and cognition.

**IN:** What tools should the audiologist be using to assess cognition in a busy practice?

**KPF:** To date, a number of tests assessing working memory have been used in much of the research investigating the connections between auditory and cognitive processing. Tests suitable for clinical use to evaluate working memory in patients with hearing loss are being developed, but more research is needed before these experimental measures will become available as standardized tests. Information about comorbid health issues, including information about dementia, could be provided in referral documentation, obtained from the patient or family members during history-taking, observed by the audiologist during appointments, or possibly discovered by conducting one of the widely used tests that have been developed to screen for dementia.

**IN:** Should there be specific training requirements for audiologists and other hearing professionals in order to properly assess cognitive function for the purpose of developing an appropriate treatment plan?

**KPF:** Let’s assume that testers would learn and follow standardized methods for conducting cognitive tests, including carefully controlling noise in the test environment and the audibility of test materials because the accuracy of cognitive
assessment can depend on how well the patient is able to hear during testing. More importantly, audiologists and other hearing professionals would need to learn how to use the results to plan treatments. Specifically, awareness of the patient’s cognitive status would need to be considered in relation to the goals of the patient and the potential of the patient to optimize and compensate to achieve those goals. In particular, rehabilitation for those who have both hearing and cognitive losses will need to be customized to meet the needs of the individuals and their caregivers (e.g., patients may need simpler technologies or assistive devices, more support from family or other caregivers, and more follow-up appointments to ensure success).

**IN:** How do patients react to cognitive testing? Could frustration during testing affect their attitude toward the clinician and treatment?

**KPF:** Audiologists often conduct difficult tests (e.g., speech-in-noise threshold testing), so they should be able to extend this expertise to other potentially difficult testing situations. Patients need to know why and how test results will be used to help them be more successful. Relating testing back to the patient’s problems should help to explain the relevance of cognitive testing. Patients often report that they can “hear” but cannot understand easily, experience difficulty following rapid speech, have trouble keeping track of multiple talkers during group conversations or have difficulty listening while multitasking. Patients who have these complaints are already on their way to realizing that the brain is working hard to understand, focus attention and remember what was said when they are struggling to hear.