Does hearing aid use really affect cognitive ability?

Jason Galster, Ph.D., Justin Burwinkel, Au.D and Katherine Stevens, Ph.D.

The relationship between hearing loss and cognitive ability has been the focus of research across multiple disciplines, causing a convergence among psychology, gerontology, epidemiology and audiology. This work has resulted in meaningful observations, allowing us to determine that people who suffer from untreated hearing loss exhibit greater cognitive impairment than their normal hearing peers or their peers with appropriately treated hearing loss. Many questions remain, including the impact hearing aids have on cognitive ability.

Today, we understand that patients with differing cognitive abilities will demonstrate different hearing aid outcomes. As an example, older adults with reduced cognitive ability are more susceptible to distortions in sound quality from hearing-aid processing (Arehart et al., 2013). These same patients also show mild benefits of slower compression, when compared to faster compression time constants (Souza & Sirow, 2014). In both cases, providing a hearing aid that is less prone to distorting the speech signal when amplifying was beneficial to the cognitively impaired patient.

Amplitude compression in hearing aids isn’t the only signal processing technology that can interact with cognitive ability. Features like directional microphones and digital noise reduction allow patients to perform difficult listening tasks while also efficiently completing secondary tasks. Even in cases where individuals scored 100 percent on a speech-in-noise test, performance of a secondary task might improve when these features are activated (Wilson, 2011; Desjardins & Doherty, 2014).

As with almost any perceptual ability, the details of these interactions are far more complicated than could be addressed in this article. Take the case in which the cognitive demands of listening change with hearing aid experience.

Faculty at the University of Linköping in Sweden have recently completed a study in which cognitive abilities were compared to hearing aid outcomes at the time of hearing aid fitting and incrementally over the following six months. Data collection began four months prior to being fitted with hearing aids, at which time patients completed tests of cognition and speech recognition; the latter were administered again at the hearing aid fitting appointment and at three month intervals afterward. After six months of hearing aid use, speech recognition had improved, but correlations between cognitive measures and speech recognition had declined. In other words, at the time of hearing aid fitting, cognitive ability held a stronger relationship to speech recognition. These observations suggest that the cognitive requires of listening decreased as patients adapted to hearing aid use.

As clinicians we should be prepared to inform patients that our most recent research has begun to confirm that hearing aid use attenuates some negative effects of cognitive decline. Many details of these benefits remain unclear; we can speak of them in generalities but should not take the leap to suggest that hearing aid use affects onset of cognitively-related disorders such as dementia or Alzheimer’s disease.
References


