

The Relationship Between Hearing Ability & Cognition/Dementia

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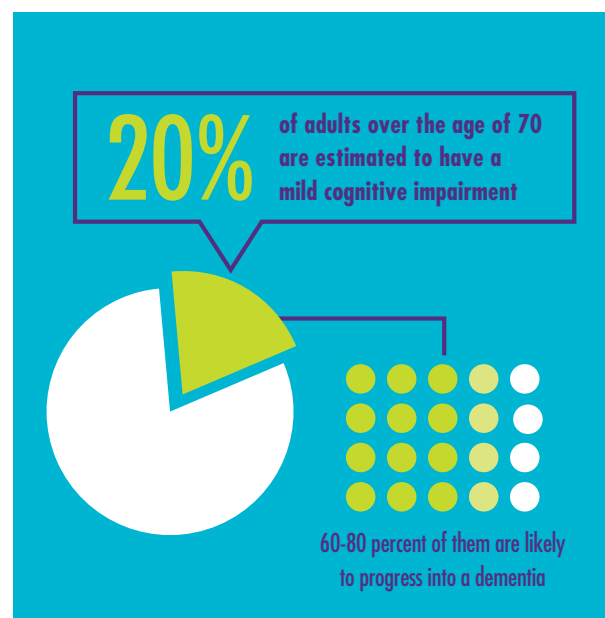
It is well known that older individuals, with or without hearing loss, have difficulty understanding speech in challenging listening environments. Cognitive abilities explain why, in some listeners and in some listening situations, speech is easily and effortlessly understood, while in other situations, understanding speech takes significant effort and consumes significant cognitive resources (Akeroyd, 2008; Rönnberg et al., 2008; Tun et al., 2012).

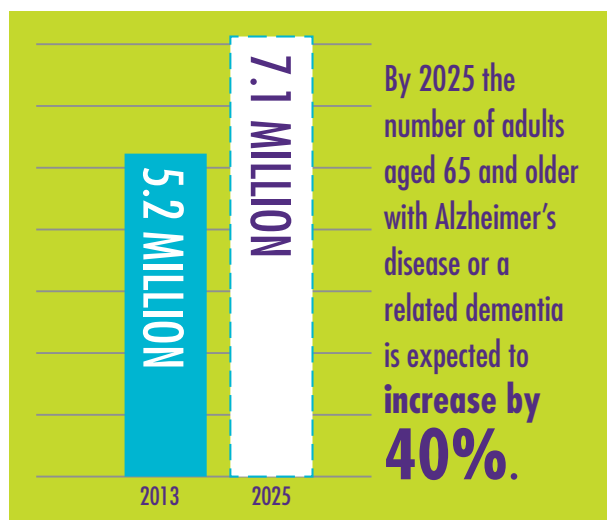
Cognitive abilities are the mental processes involved in crystallized and fluid intelligence. Crystallized intelligence encompasses world knowledge, vocabulary, and long-term memory. Fluid intelligence involves the cognitive constructs of working memory, speed of processing, attention/inhibition, and central executive function (Edwards, 2002). While some decline in cognitive function is normal with aging, when decrements in memory, reasoning, planning and/or behavior become severe enough to reduce a person's ability to perform everyday activities, the diagnosis is dementia (Santacruz & Swagerty, 2001).

Similar to age-related hearing loss, dementia is often progressive, starting out as a mild cognitive impairment (MCI) which can gradually become worse (Petersen, 2004). While over 20 percent of adults over the age of 70 are estimated to have an MCI, 60–80 percent of them are likely to progress into a dementia, including the most prevalent type—Alzheimer's disease (Petersen et al., 2009). Of particular concern to hearing healthcare professionals are the research findings that indicate that older adults with hearing loss are significantly more likely than adults with normal hearing to develop dementia (Lin et al., 2011).

Indeed, in the United States, where age-related hearing loss is the third most common chronic disability, it is estimated that 5.2 million adults aged 65 years and older have Alzheimer's disease or a related dementia. By 2025 this number is expected to increase by 40 percent to 7.1 million (Thies & Bleier, 2013). Given these statistics, there is a critical need to better understand the hearing-cognition relationship and its implications for practice.

Current literature supports the relationship between cognition and hearing (Bush et al., 2015), but why this occurs is unknown. One possibility is that the widespread neural degeneration in the brain that causes cognitive impairment also affects hearing function (Anstey et al. 2001). Another possibility is that as hearing loss occurs, greater resources are allocated to auditory processing, leaving fewer resources available for other cognitive

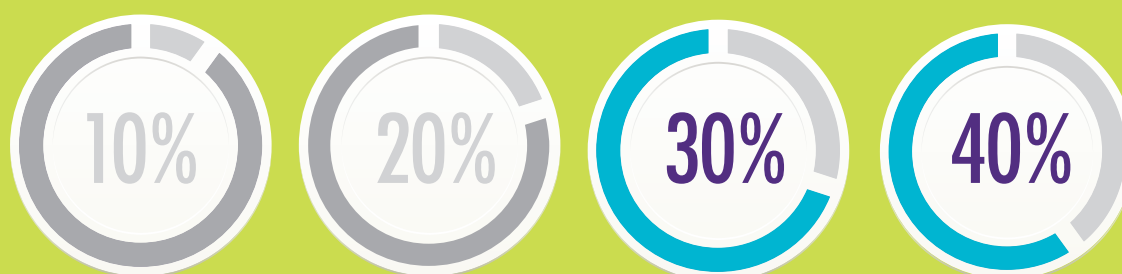




processes (Schneider & Pichora-Fuller, 2000). It may also be that hearing-related communication difficulties result in social isolation, which concomitantly impacts negatively on brain function (Mick et al., 2014). Finally, it is possible that these factors combine to result in the common complaint of older individuals — “I can hear you, but I can’t understand.”

Whatever the cause, the link between hearing and cognition may offer a starting point for intervention, with perhaps the simplest approach being amplification. While the use of hearing aids may not to be a “cure” for dementia, it has been hypothesized that their use may slow the rate of

cognitive decline (Lin et al., 2013) and possibly reduce daily mental fatigue (Hornsby, 2013; Sarampalis et al., 2009). While it is also important to consider how cognitive function may impact the selection of hearing aid parameters (Lunner & Sundewall-Thorén, 2007) and the success of intervention (Pichora-Fuller & Singh, 2006), hearing aid use in adults with dementia reduces caregiver stress (Palmer et al., 1999). In sum, hearing healthcare providers need to consider that their interventions may help preserve cognitive abilities and also the impact of cognitive decline on intervention options.



THOSE WITH UNTREATED HEARING LOSS EXPERIENCE A 30-40% GREATER DECLINE IN THINKING ABILITIES COMPARED TO THOSE WITHOUT HEARING LOSS.

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