

# Driving May Help Prevent Cognitive Decline

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Driving a car is one of the most cognitively complex tasks we engage in on a daily basis. Driving requires an assortment of cognitive skills including executive functioning, information processing, visual processing, and memory. As we age, these cognitive skills tend to decline, making driving more difficult and dangerous over time.

However, a recent research suggests that the cognitive demands of driving may actually help reduce declines in cognition caused by aging.

Additionally, driving (or at least easy mobility) may also play a role in keeping seniors healthy, active, and socially engaged. People who are unable to drive safely should relinquish their keys, but several previous studies have demonstrated that driving cessation is associated with declines in both emotional and physical health for seniors.

A recent epidemiological study conducted by behavioral scientists Moon Choi (University of Kentucky) Matthew C. Lohman (University of Kentucky), and Brian Mezuk (Virginia Commonwealth University) concluded that driving may be positively linked to maintaining cognitive function.

“Prior research has indicated that poor cognitive functioning is associated with risk of driving cessation,” Choi and colleagues write. “However, our findings suggest that it may also be the case that driving cessation itself is a risk factor for accelerated cognitive decline over time. This suggests that the relationship between driving cessation and cognitive functioning may be bidirectional.”

Choi and colleagues analyzed data from over 9,000 seniors collected over a 10-year period, from 1998 to 2008. At each wave of the study, participants completed an over-the-phone cognitive battery that included measures of memory, speed of mental processing, knowledge, and language. Participants were also asked about their current driving status: whether they were active drivers, former drivers, or had never driven.

The researchers found that participants who ceased driving – i.e., former drivers – showed accelerated cognitive decline over the subsequent 10 years compared with active drivers even after controlling for baseline cognitive functioning and health status.

“This study suggests that older adults without independent driving mobility may be a high-risk group for accelerated cognitive decline and may benefit from targeted interventions that promote social, psychological, and cognitive engagement,” the researchers argue.

In one such intervention, a team of psychological scientists led by Jerri Edwards (University of South Florida) designed a cognitive training program targeting seniors at risk for cognitive decline and car accidents.

Edwards and colleagues recruited around 500 seniors (60 years and older) to participate in the study. All participants completed a visual processing speed task — poor performance on this task indicates an increased risk for car crashes. The 134 participants who received poor scores on this test were randomly assigned to either a cognitive training intervention or a computer training control group.

Participants in both interventions met with a trainer in small groups for 10 one-hour sessions. Those in the cognitive training group completed computer exercises designed to enhance information processing speed, such as identifying and localizing visual (cars and trucks) and auditory (series of tones) targets. Participants in the computer training condition completed training exercises on basic computer usage, such as using e-mail.

The 366 participants who did not show signs of cognitive slowing on the visual processing speed task served as a reference group.

At a follow-up 3 years later, the researchers found that at-risk older drivers who had received cognitive processing training were still driving at the same rates as low-risk older drivers. In comparison, participants in the computer training group experienced self-reported declines in driving difficulty and frequency.

“Cognitive speed of processing training can not only improve cognitive performance but also protect against mobility declines among older drivers,” Edwards and colleagues write. “Scientifically proven cognitive training regimens have the potential to enhance the everyday lives of older adults.”

Both groups of researchers acknowledge caution that their studies have limitations. Beyond cognitive or health issues, seniors also frequently report financial difficulties as one reason they stop driving. Seniors living in more densely populated areas may have more access to alternative means of transportation, and may thus have different cognitive outcomes than seniors living in more isolated or rural areas.

## **References**

Choi, M., Lohman, M. C., & Mezuk, B. (2014). Trajectories of cognitive decline by driving mobility: evidence from the Health and Retirement Study. *International Journal of Geriatric Psychiatry*, 29(5),

447-453. doi: 10.1002/gps.4024

Edwards, J. D., Myers, C., Ross, L. A., Roenker, D. L., Cissell, G. M., McLaughlin, A. M., & Ball, K. K. (2009). The longitudinal impact of cognitive speed of processing training on driving mobility. *The Gerontologist*, 49(4): 485–494. doi: 10.1093/geront/gnp042