

Older adults no slower than young adults at taking control of semi-autonomous vehicles

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Young driver in the semi-autonomous driving simulator. Credit: Jing Feng

New research from North Carolina State University finds that older adults have comparable response times to young adults when tasked with taking control of a semi-autonomous vehicle.

"Before we see fully autonomous cars enter the marketplace, we are likely to see semi-autonomous vehicles on the road; to a certain extent, we're seeing hints of this already," says Jing Feng, an assistant professor of psychology at NC State and senior author of a paper on the work.

"These cars will handle the driving most of the time, but will require drivers to take control of the vehicle under certain circumstances – such as when the weather affects visibility.

"We wanted to know whether and how a driver's age affects his or her ability to take control of the vehicle, and what sort of notification from the computer is most effective at getting drivers to take control in a safe and timely way," Feng says. "For example, are there changes in driver response time as a result of age?"

To explore this issue, researchers performed an experiment with 35 drivers: 17 drivers between the ages of 18 and 35, and 18 drivers between the ages of 62 and 81.

Study participants were placed in a driving simulator and the concept of semi-autonomous vehicles was explained. Participants knew they would need to take control of the vehicle at some point, but were otherwise allowed to choose how to occupy themselves.

Driver behavior was observed by four video cameras, as well as via the simulator itself. The researchers also used two types of warning indicators, to tell drivers when they needed to take [control](#) of the vehicle: one type of indicator gave drivers a warning 4.5 seconds before the autonomous system shut off; the second type of indicator gave drivers a warning 7.5 seconds before the system shut off.

After analyzing the results of the experiment, researchers found that younger drivers primarily made use of electronic devices, while [older drivers](#) predominantly engaged in conversation. The researchers also

found that older drivers responded to the warnings as quickly as younger drivers, though older drivers fared slightly better with the earlier, 7.5 second warning. There was also some discrepancy in post-takeover behavior.

Older drivers, for example, tended to brake harder than young drivers.

"While this sort of braking behavior could cause traffic problems, ultimately both age groups were capable of taking over the vehicle in a safe and timely way," Feng says.

"That is despite the fact that we found older drivers engage in secondary, non-driving activities more than we expected – though it was still less than the younger group," Feng says.

More information: Age differences in the takeover of vehicle control and engagement in non-driving-related activities in simulated driving with conditional automation, *Accident Analysis & Prevention*.

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