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November 16, 2017

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Teens with weak attention skills at greater risk of hazardous driving

PHILADELPHIA – Teenage drivers are three times more likely to be involved in a fatal crash than adults, and one potential contributing risk factor is the ongoing development of a group of attention skills known as “executive function.”

In a new literature review, researchers at the Annenberg Public Policy Center and Children’s Hospital of Philadelphia find that teenagers with weaknesses in certain processes that are part of executive functioning are at a greater risk of poor driving. These teens are more likely to have difficulties such as staying in their lane or driving inappropriately fast, errors that are associated with a greater risk of crashes.

“It seems that limited abilities to inhibit distracting information, and to monitor, update, and integrate task-relevant information in the moment, contribute to poorer driving performance and higher crash-risk in adolescents,” the researchers concluded [in their review](#), which was published in the International Journal of Environmental Research and Public Health.

Executive function develops throughout adolescence and peaks in late adolescence but there are large individual differences in timing and capacity. Studies of these skills have found that they are related both to simulated driving behavior and reports of citations for poor driving.

Executive Function and poor driving

Among the main processes in executive function are “working memory,” or the ability to keep information in mind and utilize it, which underlies the ability to multitask. Working memory is also related to the ability to filter out and suppress irrelevant and distracting information.

“Working memory ability and the ability to ignore or manage distractions show a relationship with driving outcomes in teens,” said the paper’s lead author, Elizabeth A. Walshe, Ph.D., a postdoctoral fellow at the Annenberg Public Policy Center (APPC) of the University of Pennsylvania. “Teens with lower performances on these abilities have more self-reported crashes and traffic citations and engage in more distracted driving.”

The researchers also looked at the role of an executive function process called “set-shifting,” or the ability to shift attention and responses when a task or circumstances change. They did not find a significant relationship between set-shifting and driving outcomes, though the authors said that more systematic research was needed.

The need for better driver training

“The findings indicate that current driver training programs may not be adequate to compensate for these weaknesses,” said review co-author and APPC research director Dan Romer, Ph.D. “There is a great need for compensatory training for young novice drivers who exhibit weakness in attention skills.”

Romer and Walshe suggested that driver training programs could screen for adolescents who show difficulties with executive function. Simulated driver training could help with teaching teenagers to drive under complex conditions or with multitasking, they said. Similarly, teens with poor executive function skills could be trained to drive while exposed to distractions.

The researchers also suggested that new assistive technologies such as lane-departure warning systems can help teens avoid collisions, and cellphone blocking technology can be deployed to help them avoid distractions.

In addition to Walshe and Romer, the review was co-authored by Flaura K. Winston, M.D., Ph.D., scientific director of the Center for Injury Research and Prevention (CIRP) at Children’s Hospital of Philadelphia, and Chelsea Ward McIntosh at CIRP.

[“Executive Function Capacities, Negative Driving Behavior and Crashes in Young Drivers”](#) is published in The International Journal of Environmental Research and Public Health.

[The Annenberg Public Policy Center](#) was established in 1994 to educate the public and policy makers about the media’s role in advancing public understanding of political and health issues at the local, state and federal levels.