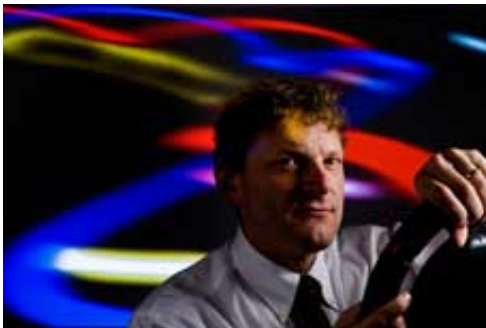


Bad driving may have genetic basis, study finds

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UCI neurologist Dr. Steven Cramer, who studies brain repair after stroke and brain remodeling, published a study suggesting that bad driving may in part be genetically based. Photo by Steve Zylus / University Communications

Bad drivers may in part have their genes to blame, suggests a new study by UC Irvine neuroscientists.

People with a particular gene variant performed more than 20 percent worse on a driving test than people without it - and a follow-up test a few days later yielded similar results. About 30 percent of Americans have the variant.

"These people make more errors from the get-go, and they forget more of what they learned after time away," said Dr. Steven Cramer, neurology associate professor and senior author of the study published recently in the journal [Cerebral Cortex](#).

This gene variant limits the availability of a protein called brain-derived neurotrophic factor during activity. BDNF keeps memory strong by supporting communication among brain cells and keeping them functioning optimally. When a person is engaged in a particular task, BDNF is secreted in the brain area connected with that activity to help the body respond.

Previous studies have shown that in people with the variant, a smaller portion of the brain is stimulated when doing a task than in those with a normal BDNF gene. People with the variant also don't recover as well after a stroke. Given these differences, the UCI scientists wondered: Could the variant affect an activity such as driving?

"We wanted to study motor behavior, something more complex than finger-tapping," said Stephanie McHughen, graduate student and lead author of the study. "Driving seemed like a good choice because it has a learning curve and it's something most people know how to do."

The driving test was taken by 29 people - 22 without the gene variant and seven with it. They were asked to drive 15 laps on a simulator that required them to learn the nuances of a track programmed to have difficult curves and turns. Researchers recorded how well they stayed on the course over time. Four days later, the test was repeated.

Results showed that people with the variant did worse on both tests than the other participants, and they remembered less the second time.

"Behavior derives from dozens and dozens of neurophysiologic events, so it's somewhat surprising this exercise bore fruit," Cramer said.

The gene variant isn't always bad, though. Studies have found that people with it maintain their usual mental sharpness longer than those without it when neurodegenerative diseases such as Parkinson's, Huntington's and multiple sclerosis are present.

"It's as if nature is trying to determine the best approach," Cramer said. "If you want to learn a new skill or have had a stroke and need to regenerate brain cells, there's evidence that having the variant is not good. But if you've got a disease that affects cognitive function, there's evidence it can act in your favor. The variant brings a different balance between flexibility and stability."

A test to determine whether someone has the [gene variant](#) is not commercially available.

"I'd be curious to know the genetics of people who get into car crashes," Cramer said. "I wonder if the accident rate is higher for drivers with the variant."

Source: University of California - Irvine

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