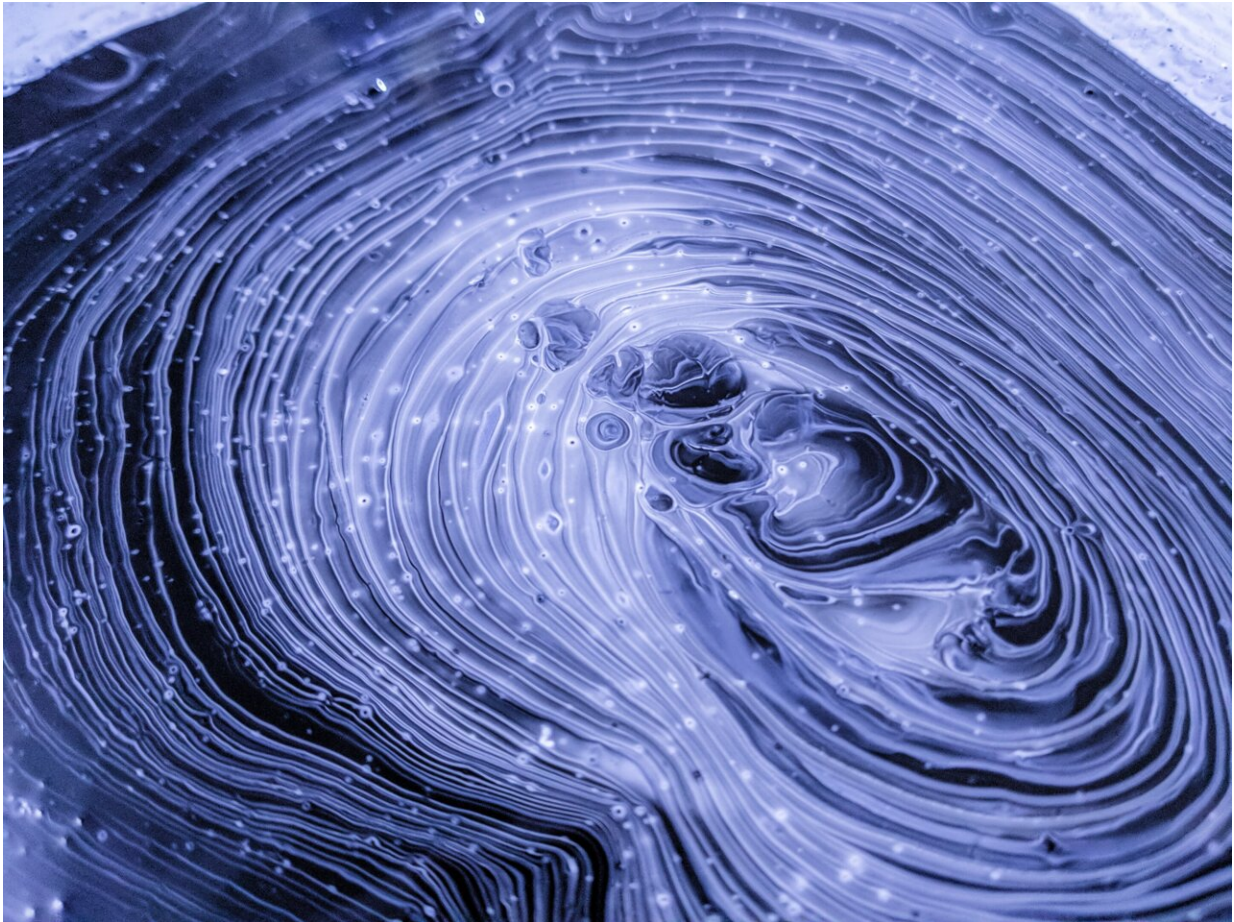


Making bicycling safer for kids with ADHD

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Child development experts have long known that children with attention-deficit hyperactivity disorder are more likely to have an accident while crossing the street on their bicycles.

Now, researchers at the University of Iowa have discovered the reasons why and are hoping this information will help parents teach their [children](#) with ADHD how to better navigate busy intersections.

"Crossing [roads](#) on a bicycle requires decision and action," says Molly Nikolas, an assistant professor in the UI Department of Psychological & Brain Sciences and corresponding author of the study. "What we found is children with ADHD have deficits in both areas."

ADHD is a common, developmentally persistent neurodevelopmental disorder that, according to the Centers for Disease Control and Prevention, affects 5.9 million children between the ages of 3 and 17 in the United States.

UI Researchers studied how 63 children—27 with ADHD—crossed 12 intersections with continuous cross traffic while riding in a real-time bicycle simulator. The children, between the ages of 10 and 14, rode stationary bikes surrounded by three 10-by-8-foot screens that projected images of a typical Midwest town.

They discovered that overall, the children with ADHD selected about the same size gaps between cars as the others in the study, but their timing entering the roadway was less precise. Consequently, the children with ADHD had less time to spare compared to the non-ADHD children.

However, following exposure to heavy traffic with shorter gaps between cars, the children with ADHD struggled to adjust their behavior when the traffic eased up and wider gaps were once again available. Instead of waiting for these larger gaps, the children with ADHD continued to choose the shorter gaps, on average, more than the non-ADHD youth—thus, putting themselves at unnecessary risk.

"What we found is the timing issues were more related to symptoms of

inattention while the decisions about which gaps to cross were related to hyperactivity and impulsivity—all core symptoms of ADHD," Nikolas says.

Children with ADHD also experienced more "close calls" when crossing the intersections, defined as having less than one second to spare when crossing. They also had more "close calls" than non-ADHD youth when crossing the high-density traffic intersections. These intersections can be especially problematic—on average, participants with and without ADHD were hit 16 percent of the time when crossing intersections with high-density traffic.

None of the children with ADHD were on medication at the time of the study.

Researchers say the best way to help children with ADHD cross busy intersections may not be to focus on their timing deficits, but rather teaching them to look for the longer gaps between cars, no matter how dense the traffic.

"Even if their timing remains off, if they have a big enough gap, they will be OK," Nikolas says. "If we can have some intervention or prevention strategies that focus on the decision making, that may help compensate for the timing deficit."

The study, "Risky Bicycling Behavior Among Youth With and Without Attention-Deficit Hyperactivity Disorder," was published this month in the *Journal of Child Psychology and Psychiatry*.

According to the study, "Bicycle crashes are among the most common causes of severe injuries in childhood. Nearly 400,000 children are treated at emergency rooms yearly for bicycle-related injuries in the U.S."

In 2013, the National Traffic Safety Administration reported that a significant number of injuries involving children and [bicycles](#) are due to collisions with motor vehicles, and about one-third of all bicycle fatalities involving collisions with motor vehicles occur at intersections.

Though the UI study looked only at the risks children take while crossing intersections, experts already knew that children with ADHD are twice as likely as others their age to be involved in any type of bicycle crash.

But that's where most of the research has stopped, says Nikolas, who is interested in uncovering why children with ADHD have so many more unintentional injuries than their peers.

"What is it about their disorder, the symptoms that they have, that may increase injury?" says Nikolas. "If we can identify how that works, we can develop more targeted prevention strategies.

"So instead of telling families, 'Hey, watch out, your child has ADHD,'" she adds, "we can give families more skills in terms of what they might be able to do to help their child."

Russell Barkley, a clinical psychologist at the Medical University of South Carolina and author of several books about ADHD, recommends parents gradually expose their children with ADHD to different scenarios while bicycling. He also says ADHD medications also can help some children.

"It has shown to decrease general accidental injury risks in ADHD youth by 31 percent to 43 percent over untreated ADHD populations by age 10 to 12," he says. "It has also improved the driving performance of ADHD teens and young adults."

Nikolas says future studies will look at how children with ADHD, both

on and off medication, perform in the bicycling simulator, as well as the influence of peers while bicycling.

Provided by University of Iowa

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