

BUFFALO, N.Y. -- Using the bells and whistles of a state-of-the-art entertainment arcade, a University at Buffalo Graduate School of Education project aims to improve the driving habits of teenagers at the very top of the risk pool, and at the same time bring child and parent together for a happier, better functioning family.

The population identified as risky drivers: teenagers with ADHD or attention-deficit hyperactivity disorder.

The method: a high-tech and newly improved driving simulation program complete with real sounds and computer-generated highways based on actual streets and busy intersections around UB's North (Amherst) Campus.

The innovation researchers believe will make the study more authentic and effective: While keeping many of the flashy attractions of the old driving simulator, the new setting is the actual front half of a real car. When the teenagers and their parents participating in the study climb into the shell of the Ford 1999 Contour, they can't help but feel they're actually driving, not putting tokens into a multiplex arcade game.

It has been long known that teenage drivers are the most at risk for just about every negative driving outcome you can imagine -- moving violations, accidents, accidents with injury/death, drunk driving -- it goes on and on, says Gregory A. Fabiano, assistant professor in the Department of Counseling, School and Educational Psychology in UB's Graduate School of Education, and lead investigator for the project. Recent research has shown that a teenager with ADHD is significantly more at risk than this already highly at-risk group.

The effect ADHD has on already at-risk drivers makes sense logically, Fabiano says. Impulsive behavior and inattention to the task at hand -- both common symptoms of teens with ADHD -- run contrary to the caution and continuous focus needed to be a safe driver. When ADHD teens get behind the wheel to learn to drive, it's often a recipe for an acrimonious encounter with a parent doing the driving lessons.

The teen that needs the most instruction gets the least because of ineffective parental and teen communication, says Fabiano.

Fabiano's study, which comes with a \$36,000 grant from the UB 2020 Interdisciplinary Research Development Fund from UB's Office of the Vice President for Research, seeks to change that, all of it. Students and parents participating in the program first meet individually with a clinician to work on specific skill building related to effective communication and driving.

For the second part of the session, the teenager and parent take part in a joint activity. Often the teenager practices on the driving simulator while the parent, sitting in the passenger seat, practices a parenting skill. If the parent intends to work on noticing the child's positive

behavior, the parent compliments the teenager's good driving skills. Each week the parent and teen also set up a contract to work on a specific behavior related to driving or another issue at home.

Throughout the sessions, those in the study (Fabiano says about 10 families will take part) face a state-of-the-art driving simulator that emphasizes what engineering researchers call an authentic highway experience.

The driving simulator comes complete with screeching noises when the driver speeds or turns too abruptly, deer crossings, slippery roads, a construction zone with hazards, horns and situations related to dealing with aggressive drivers. Drivers and passengers can hear the hum of the car engine or hear the revving noises as the engine accelerates. And since the computer program is based on actual local highways, the teenager/parent team can retrace the path on the actual streets featured on the driving simulator.

Previously, our motion simulator used a generic passenger cabin which seated two people, said Kevin F. Hulme, research associate for the New York State Center for Engineering Design and Industrial Innovation (NYSCEDI), who designed and operates the driving simulator. It was 'open air' (no roof), and it had an 'entertainment' feel to it. So, if we were going to simulate a roller coaster, it served its purpose, but for more serious research applications (i.e., flight, driving and training applications), it just didn't feel authentic enough.

Now, with our latest cabin, participants are actually sitting in a car -- a real car. You cannot get any more authentic than this, because it truly is the real thing. Real seats, a real console, a real windshield, and a real (closed) vehicle shell. Along with the on-board steering wheel and pedals (both of which are well-engineered, and have a realistic feel to them), we are giving our riders the next-best thing to being inside a real vehicle on an actual roadway.

The project aims to give ADHD teenagers and their families an alternative to drug treatment. Fabiano says the most common treatment for ADHD -- stimulant medication -- often does not eliminate the risk of driving. Teens often do not like to take medicine, and even when they do, typical medication is not active during the early morning or evening, which are the most risky times for teen drivers.

There are some well-developed psychological treatments for ADHD, but none focus specifically on teen driving behaviors, Fabiano says. So our team worked to develop a parent-teen driving program that helps parents work on their monitoring and parenting skills with the teen, teaches the teen better communication skills and driving behaviors, and that uses innovative technology to support treatment efforts.