



DISCOVER

ENGAGE

IMPACT



PERCEPTION AT THE WHEEL

To reduce the risk of road and traffic accidents, UQ researchers are training drivers to take a more hazard-conscious approach at the steering wheel, potentially saving countless lives in the process.

As our reliance on road transport increases, so too does the incidence of road accidents. More than 1.25 million people worldwide die each year as a result of traffic crashes – in Australia alone, there were 1226 road fatalities in 2017.

One of the main reasons these accidents occur is drivers' inability to recognise and respond to hazards.

To address this issue, UQ School of Psychology's Professor Mark Horswill, along with Dr Andrew Hill, and Associate Professor Marcus Watson, developed an online program that coaches drivers to be more perceptive of hazards. This latest course is part of research that includes the highly successful hazard perception test that is currently part of the Queensland Government's driver licencing system.

"Since 2008, approximately 440,000 drivers have taken our test as part of the graduated licensing scheme that Queensland drivers need to complete to obtain their open driver's licence," Professor Horswill says.

"Independent data released in 2016 indicate that novice crash rates have reduced by 13 per cent every year as a result of this licensing scheme – which our test is a central component of."

The team's new hazard perception training program complements the hazard perception test. Developed according to psychological

research findings, it can be accessed by anyone, anywhere, as long as they have internet access.

"In traditional driver training, drivers don't get to see the very things that we're trying to train them to avoid – crashes. Our training program shows participants video footage of over a hundred real life Australian crashes, as well as near-misses and other traffic conflicts," Professor Horswill says.

"Given that the average driver crashes once every ten years, trainees are essentially experiencing more crashes than the collective knowledge of over a thousand years of driving experience.

"Expert drivers share their insights into how to anticipate and avoid these crashes, via a number of different evidence-based exercises."

THE PSYCHOLOGICAL ADVANTAGE

So, how does psychology help researchers to train drivers in hazard perception?

The central premise of the research is that drivers with good hazard perception have a more sophisticated mental representation of the traffic environment than drivers with bad hazard perception.

This more sophisticated mental representation provides expert drivers with all sorts of advantages, such as being better able to predict what could happen next in any given traffic situation. The hazard perception test is designed to showcase the

level of sophistication of a driver's mental representation. This is why it is thought drivers who score higher in the hazard perception test have fewer crashes.

The hazard perception training program refines the trainees' perceptions of driving, by showing them various examples of dangerous situations and providing expert drivers' reactions.

"We give each participant an expert's insight in driving environments, so that they learn to see more than the average driver usually would," Professor Horswill says.

Participants therefore improve their own understanding of traffic environments, so they can better anticipate and avoid danger when they are out on the road themselves.

DEFENSIVE DRIVING BY ANY OTHER NAME?

While it may seem similar, this training program shouldn't be confused with defensive driving training.

"One crucial difference with our program is our use of video footage. This means that we can show more rare and dangerous situations than would be possible during a typical on-road driving lesson. We essentially compress a thousand years of crash experience into a little over three hours," Professor Horswill says.

"Our assessments and training are developed and evaluated using scientific evidence, which means we can be more certain that

the training program does what it is intended for – reducing the risk of traffic accidents and road fatalities.

“Compared to others, our program can be easily rolled out at scale, and at minimal cost, because it is automated and online.”

Another crucial difference is that driver training is usually regarded as a ‘one hit wonder’. Although many perceive that one or two days of defensive driver training remains effective for the rest of a driver’s life, evidence suggests that this assumption is unlikely to be true.

“Our approach allows drivers the opportunity to return for regular, low-cost, high-convenience online booster training sessions, maintaining drivers’ hazard perception skills at a high level throughout the years,” Professor Horswill says.

Professor Horswill also found that traditional training often increases drivers’ confidence – which isn’t always a good thing, because it can lead to more dangerous driving as confident drivers take more risks on the road.

“Drivers who have taken our perception training don’t increase in confidence. In fact, evidence suggests that elements of our training reduces risk-taking behaviours such as speeding,” Professor Horswill says.

THE ROAD AHEAD

Although the longer-term project has already influenced so many Queensland drivers’ perceptions for the better, Professor Horswill has an even grander vision for this phase of the training’s future.

“We’re at the stage where we have a working prototype, and are currently running formal evaluations,” Professor Horswill says.

“We have already published evidence that elements of our training program benefit a wide range of drivers, including young novices, drivers with Attention Deficit Hyperactivity Disorder (ADHD) symptoms, mid-age experienced drivers, and drivers aged over 65.

“Our next step is to persuade government and industry to promote and use our new training program.”

With a positive reduction in crash rates from only Queensland drivers taking the 2008 hazard perception licencing test, Professor Horswill’s training program sees further substantial reduction on drivers’ crash rates.

“My ultimate vision would be for all drivers, at all levels of experience and different demographics, to complete some version of this product, which would help reduce crash rates.”

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(Image credit: Getty Images/iv-serg)

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Contact details:

Professor Mark Horswill, School of Psychology

Email: m.horswill@psy.uq.edu.au

Phone: +61 7 3346 9520

Web: UQ Researchers

Progress to date:

1999: Article on hazard perception and its relevance for licensing drivers is published in the *Journal of the International Association of Traffic and Safety Sciences*, Volume 23, Issue 1.

2002: Hazard perception test introduced as part of the UK driver licensing procedure, which is based on a test developed by a lab at which Professor Horswill was a member.

2006: Research on anticipation training affecting risk taking in drivers’ is published in the *Journal of Experimental Psychology: Applied*, Volume 12, Issue 1.

2007: Queensland Government tenders for provision of hazard perception test.

2008: Queensland Government introduces hazard perception test, designed and developed by Professor Horswill, Dr Andrew Hill, and Dr Mark Wetton at UQ.

April 2010: Study on hazard perception and drivers with ADHD is published in the *Australian & New Zealand Journal of Psychiatry*, Volume 44, Issue 6.

January 2011: Research on hazard perception tests for novice drivers is published in *Accident Analysis & Prevention*, Volume 43.

2013: Study on training novice drivers is published in *Accident Analysis & Prevention*, Volume 67.

January 2014: Research on the impact of stereotypes in the performance of older drivers is published in the *Journal of Applied Gerontology*, Volume 35, Issue 6.

March 2015: Research on the long-term effects of hazard perception training in older drivers published in *Psychology and Aging*, Volume 30, Issue 1.

September 2015: Study on video-based hazard perception tests is published in *Accident Analysis & Prevention*, Volume 82.

2016: School of Psychology software and content for hazard perception training program undergoes development by Professor Horswill, Dr Andrew Hill, and Associate Professor Marcus Watson.

2016: Research on hazard perception in driving published in *Current Directions in Psychological Science*, Volume 25.

2016: A book chapter on hazard perception tests written by Professor Horswill is published in *The Handbook of Teen and Novice Driver: Research, Practice, Policy, and Directions*.

November 2016–May 2017: Training program undergoes extensive usability testing and iterative design to create a fully-working prototype.

April 2017: Study on the effects feedback has on drivers’ hazard perception ability is published in *Accident Analysis & Prevention*, Volume 101.

May 2017–December 2017: Training program prototype undergoes pilot testing.

December 2017–October 2018: Formal randomised-control trials of hazard perception training program are conducted.