DEVELOPMENT OF A NOVICE DRIVER TRAINING MODULE TO ACCELERATE DRIVER PERCEPTUAL EXPERTISE

INTRODUCTION

Numerous studies have shown that newly-licensed drivers' crash rates rise sharply when they begin driving independently, and take several years to fall to the levels of experienced drivers. The development of perceptual expertise via more on-road experience may account for this gradual improvement in crash rates. Perceptual expertise in driving refers to the ability to recognize and respond to road hazards under time pressure. Current driver training programs have focused on vehicle control and rules of the road, but programs on acquiring perceptual expertise in novice drivers have garnered little attention.

The purpose of this study was to develop a self-administered training module to accelerate the development of perceptual expertise in identifying road hazards and to evaluate its feasibility and usability with a small sample of young novice drivers.

HIGHLIGHTS

The research team developed a training module that does not require any specialized equipment or facilities other than a display monitor, can be self-administered, and focuses on the acquisition of perceptual expertise in identifying road hazards.

Participants reported little difficulty in using the module and a strong sense of improvement in recognizing potential driving hazards. The driving scenarios appeared realistic. All participants reported that they would recommend the program to other novice drivers. Experimenters reported that all participants appeared engaged and highly motivated; however, some participants read instructions carefully while others skipped through them quickly.

Five out of the six pilot-study participants demonstrated robust improvements in all of the learning categories included in the training (path conflict, stopping vehicle, roadside incursion, forced path change, obscured potential hazard, and emergency vehicle effects). The participant who did not show improvement exhibited a ceiling effect with an average of 92% accuracy in earlier trials of the training module. The learning categories were not uniformly difficult for participants. The roadside incursion category showed the highest early trial accuracy whereas forced path change showed the lowest early trial accuracy. Three participants achieved mastery criteria within two sessions.

While this approach to training appears highly promising, the study did not examine the effects of the training on actual driving skills or crash risk and whether these effects are long-lasting. Further research is needed to evaluate the real-world-impact of the training model on actual driving safety in young novice drivers.

ABOUT

Established in 1947 by AAA, the AAA Foundation for Traffic Safety is a not-for-profit, publicly funded, 501(c)(3) charitable research and educational organization. The AAA Foundation's mission is to prevent traffic deaths and injuries by conducting research into their causes and by educating the public about strategies to prevent crashes and reduce injuries when they do occur. This research is used to develop educational materials for drivers, pedestrians, bicyclists and other road users. Visit www.AAAFoundation.org for more information.

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AAA FOUNDATION FOR
TRAFFIC SAFETY
607 14th Street, NW, Suite 201
Washington, DC 20005
202-638-5944

METHODOLOGY

Participants included a convenience sample of six young drivers (three females and three males) recruited online. All participants had normal vision or normal vision with correction and a verified provisional license. Participants were scheduled for up to three one-hour sessions in which the training module was self-administered and were compensated upon completion of the study. During each session, participants were seated five feet away from a 60-inch monitor equipped with a keyboard and mouse.

The research team developed a prototype training module based on the principles of perceptual and adaptive learning, an approach that has been applied successfully in many other fields (e.g., aviation, medicine) but not in driving. The module included six learning categories identified from a review of literature focused on types of crashes in which novice drivers are commonly involved due to factors plausibly related to lack of experience:

- Path conflict - Anticipating when another vehicle on the road may move into your path.
- Stopping vehicle – Anticipating when a vehicle may slow quickly or stop suddenly.
- Roadside incursion – Anticipating when something or someone off the road may move on the road.
- Forced path change – Recognizing that something about the road ahead may force you to change your planned path.
- Obscured potential hazard – Recognizing when something significant is obscured from view.
- Emergency vehicle effects – Recognizing the presence of emergency vehicles may pose conflicts.

Within each of these learning categories were ten video clips representative of driving scenarios each concluding in a crash due to lack of driver response. There were three types of trials: “Watch” trials, “Respond” trials, and “No Event” trials. During the “Watch” trials, the participant viewed a clip, which paused before an impending hazard. Six multiple choice options corresponding to the six learning categories appeared. The participant selected the anticipated hazard depicted in the clip. During “Respond” trials, the participant viewed a video clip and pressed the spacebar when they recognized a potential hazard. The program recorded speed and accuracy during “Watch” trials. During “No Event” trials, the participant viewed a video clip in which not pressing the space bar was the correct response. The training program provided feedback for incorrect responses for all trial types.

Mastery of material was defined as five correct responses out of six presentations of the same category (80% accuracy). The experimenter observed participant behaviors and program functionality during sessions, provided assistance if necessary, and administered questions on subjective sense of improvement, perceived difficulty, likes, dislikes, and suggestions for improvement after each session.

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