

ACCELERATING TEEN DRIVER LEARNING: ANYWHERE, ANYTIME TRAINING

INTRODUCTION

Novice teen drivers have highly elevated crash rates during the first few months of independent driving. Rear-end, intersection and run-off-road crashes account for the majority of these crashes. Their high crash involvement may be due to underdeveloped skills in anticipating hidden or latent hazards, avoiding or mitigating hazards, and dividing attention between in-vehicle glances and the roadway. Recent novice driver training programs have not comprehensively trained all of these skills nor the aforementioned crash types in which teens are overinvolved.

The purpose of this study was to develop a novice driver training program to target skills needed to avoid crashes in the riskiest scenarios and to evaluate its effectiveness in improving critical skills among novice teen drivers.

KEY FINDINGS

The researchers developed Accelerated Curriculum to Create Effective Learning (ACCEL), a computer-based training program that can be downloaded from the internet on any personal computing device (e.g., laptops, smartphones, and tablets).

The program targeted six skills in the context of specific crash types based on a literature review of factors linked to novice driver crash risk including:

- Strategic hazard anticipation – recognizing when there may be latent hazards ahead.
- Tactical hazard anticipation – recognizing upon immediate approach that a hazard may emerge.
- Strategic hazard mitigation – recognizing when there may be latent hazards ahead and searching where the hazards are likely to emerge.
- Tactical hazard mitigation – maneuvering the vehicle upon immediate approach to avoid a latent hazard.
- Strategic attention maintenance – avoiding looking away from the forward roadway when a potential or immediate latent hazard is likely to emerge.
- Tactical attention maintenance – avoiding ever glancing away from the forward roadway for more than two seconds at a time.

At post-training evaluation, the ACCEL training group performed better than the placebo training group in five of the six skills. Tactical hazard mitigation performance was marginally better in the ACCEL group as compared to the placebo group.

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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The researchers further evaluated the durability of improvements three to six months post-training and the effects of a second ACCEL training session, but findings were limited due to high participant attrition.

Overall, the ACCEL training program accelerated the development of novice drivers' strategic and tactical hazard anticipation and attention maintenance skills across the riskiest crash scenarios. Further research is warranted to evaluate the effectiveness of ACCEL to reduce crashes in novice drivers and to evaluate whether training effects endure.

METHODOLOGY

Participants included 75 novice drivers aged 16 to 18 who had between 10 days and six months of independent driving experience and 25 experienced drivers aged 28 to 55 who had at least four years of independent driving experience.

The ACCEL training program consisted of three modules of error training: mistakes (placing drivers in unfamiliar situations and observing their mistakes), mentoring (providing drivers with feedback on mistakes) and mastery (allowing drivers to correct their mistakes). The six aforementioned skills were trained within potential rear-end, intersection and run-off-road crash scenarios, resulting in 18 unique scenarios. The training lasted approximately 120 minutes.

The placebo training program consisted of video tutorials on vehicle maintenance for an approximate duration of 70 minutes.

All participants were evaluated on the driving simulator with an eye tracker. The 21 total driving simulator scenarios were identical to those in the ACCEL training program, 18 of which were drives to evaluate strategic and tactical hazard anticipation and mitigation while the remaining three evaluated strategic and tactical attention maintenance. The eye tracker recorded the driver's point of gaze during the driving scenarios. The simulator evaluation lasted approximately 60 minutes.

Participants in the novice driver group were randomly assigned to either ACCEL training (n = 50) or the placebo training (n = 25). Immediately after the ACCEL or placebo training, participants underwent the driving simulator evaluation and were fitted with the eye tracking apparatus. The 25 experienced drivers were evaluated once they arrived at the lab and remained untrained throughout the study. All novice driver participants were invited to a second evaluation three to six months post-training. A subsample of the ACCEL trained participants underwent a second dose of training either at home or in the lab.

Cross-sectional comparisons were conducted between the ACCEL and placebo trained subjects to determine the immediate post-training effectiveness of ACCEL. To determine whether training effects endured and whether a second dose of ACCEL training enhanced performance, post-training effects were compared across the ACCEL first dose, ACCEL second dose, and placebo training groups three to six months post-training.

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