



Impairment of a speed management strategy in young drivers under high cognitive workload

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ABSTRACT

Background: A training method known as Episodic training has shown promise in reducing speeding behavior in young drivers (Prabhakaran and Molesworth, 2011). The present study aimed to investigate how cognitive resources are utilized to implement this behavioral change.

Method: 60 participants were randomly divided into four groups and completed a simulated training drive in Week 1 followed by a 10 km simulated test drive in Week 2. As part of the test drive, two groups were asked to complete a secondary task (mental arithmetic task) in addition to the test drive.

Results: The results indicated that implementing a speed management strategy elicited by Episodic training was successful in isolation, but came at a cognitive trade-off when performed in conjunction with a secondary task.

Conclusion: From an applied perspective, these results suggest driver training programmes should compartmentalize driver training in order to reduce the cognitive load experienced by trainee drivers, and hence facilitate in driver skill acquisition.

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1. Introduction

Despite constituting about only 15% of the driving population, young drivers account for approximately 25% of all road fatalities in Australia (Australian Transport Safety Bureau, 2004; Road and Traffic Authority, 2010). According to the World Health Organisation (2007) this 'young driver problem' is not limited to Australia as many developed countries such as the United Kingdom, Canada and the United States experience a similar problem. Young drivers' willingness to engage in risky driving practices such as speeding is thought to be a leading contributing factor to this high fatality rate. However, employing a training technique that actively demonstrates the limits on an individual's ability, in terms of speed management has proven successful in overcoming this excessive risk-taking behavior, albeit in a simulated environment (Prabhakaran and Molesworth, 2011). The aim of the present study was to investigate the cognitive implication of such a training method, termed Episodic training.

1.1. Episodic training

Episodic training involves a technique where trainees are required to make active cognitive decisions about their behavior. This is achieved by facilitating the accurate appraisal of risky driving behavior and how it can negatively impact the driver. This type of training is encompassed in the "Goals for Driver Education" (GDE) framework proposed by Hatakka et al. (2002). Their review highlights a need to shift from traditional low order skill-based training methods to high order skill-based training methods where the emphasis is placed on self-evaluation and reflective thinking of one's driving behavior. Studies by Molesworth et al. (2003, 2006, 2011) have repeatedly demonstrated the benefits of Episodic training in improving general aviation pilots' risk management skills. Similar results have been obtained in the road environment in managing speeding behavior in young drivers. Moreover, Prabhakaran and Molesworth (2011) demonstrated that providing personalized feedback about a simulated driving episode significantly lowered speeding behavior when tested one week later. In fact, employing this technique saw speeding behavior cut by more than two-thirds when compared to control. Similar results were evident in terms of the number of violations committed during the test drive. However, what remains unknown is how this new or modified behavior impacts upon performance on other related tasks. Specifically, how the implementation of this behavioral change impacts upon other tasks from a cognitive resource perspective.

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