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Review

Is there a case for driver training? A review of the efficacy of pre- and post-licence driver training

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ABSTRACT

Although driver training programs are currently popular, the degree to which they reduce crash involvement remains ambiguous. This paper aims to determine how effective driver training has been in improving young novice drivers' on-road safety and to identify key research limitations. A literature review was undertaken examining evaluations of driver training programs, primarily those published within the past decade (2001–2011). The review utilised peer-reviewed journals, conference proceedings, books, government reports and consultant reports. Both pre- and post-licence training programs were considered. Pre-licence training programs aim to develop the skills that are required to obtain a driver's licence and drive safely, such as basic vehicle control and traffic assessment. Post-licence training programs aim to enhance skills that are considered relevant to crash prevention including skid control, hazard perception and advanced vehicle control skills. The results of the review indicate that some forms of training have been effective for procedural skill acquisition and other programs have been found to improve drivers' hazard perception. Conversely, evidence suggests that traditional driver training programs have not reduced young drivers' crash risk. Caution is urged when interpreting this finding as major methodological flaws were identified in previous evaluation studies, including: no control group; non-random group assignment; failure to control or measure confounding variables; and poor program design. Further, the validity and usefulness of crash rates as an outcome measure is questionable. More robust research should be undertaken to evaluate driver training programs, using more sensitive measures to assess drivers' on-road safety.

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1. Introduction

A long-standing challenge for road safety research is that young novice drivers, aged 25 years or younger, have disproportionately high crash involvement (Elvik, 2010). Although people aged 17–25 comprise just 13% of Australia's population (ABS, 2010), they account for over 24% of road fatalities (BITRE, 2011) and similar patterns are evident in other countries (Toroyan and Peden, 2007). During the first 6 months of unsupervised driving novice drivers of all ages have an elevated crash risk, although the problem is greatest for teenage drivers (Mayhew et al., 2003). Involvement in crashes and near-crashes declines significantly after the first 6 months, but remains high; after 18 months of licensure teenagers' crash involvement is approximately three times that of their parents (Lee et al., 2011; Simons-Morton et al., 2011). The fact that all novice drivers have elevated crash risk suggests that the problems observed among young novices are due largely to inexperience, but are exacerbated by age (which determines emotional, cognitive and neurological development; see Steinberg, 2007).

Various strategies have been attempted to reduce young novice drivers' crash involvement, including limiting their exposure to high-risk situations such as night-time driving or driving with teenaged passengers. Many jurisdictions now use graduated driver licensing systems (GDLSs) in which young drivers first gain supervised driving experience on a learner's permit, then progress to unsupervised but restricted driving on a provisional or probationary licence, and finally attain a full unrestricted licence. The introduction of GDLS was associated with significant reductions in young driver crash rates in most jurisdictions (for a review see Russell et al., 2011); however, crash rates remain disproportionately high and some research suggests that strengthening existing GDLS restrictions does not result in significant further reductions in crash rates (Masten and Hagge, 2004). It is therefore necessary to explore additional means of reducing novice driver crash rates, such as driver training.

Conducted pre- or post-licensing, *driver training* focuses on the development of specific skill sets. It initially focused exclusively on procedural skills such as vehicle manoeuvring (Horneman, 1993) but has recently been extended to higher-order cognitive skills including hazard perception (e.g., Isler et al., 2011). The term "driver training" is often used interchangeably with "driver education", although the two terms have distinct definitions. *Driver education* is broader and often longer-term, typically focusing on the acquisition of knowledge about driving and road safety (Christie, 2001). Driver education can include driver training, as in school-based driver education programs that incorporate on-road training.

Although various studies have evaluated driver training programs, questions remain over their effectiveness at enhancing driver safety; some research has suggested that making people more skilled drivers does not make them safer drivers. The current paper aims to critically evaluate whether driver training is, or could become, an effective means of improving young novice driver safety, based on a literature review of recent research. In particular, the review distinguishes between pre- and post-licence driver training and considers which forms of driver training are most likely to be effective at each licensing stage. The review utilised peer-reviewed academic journals, conference proceedings, books, government reports and consultant reports, in which driver training programs were evaluated. The keywords "driver training" and "driver education" were used as search terms, since both are used to describe driver training programs. The literature search was primarily restricted to evaluations published in the past decade (2001–2011), given recent changes in licensing systems and requirements, although some earlier seminal work was included. The review focused on key details of the evaluation, specifically type of training, course content, sample size and composition, evaluation methods and outcome measures, but in some cases not all of these details were included in the original source.

The current paper focuses on pre- and post-licence driver training for young novice drivers. *Pre-licence training* involves teaching basic driving skills to learners before they obtain a driver's licence. Although the need for pre-licence driver training has long been recognised, most countries do not have compulsory training requirements for learner drivers. *Post-licence training* aims to extend existing driving skills for already licensed drivers, including provisional drivers. Post-licence training often involves instruction on managing difficult situations, such as skid handling or advanced braking, which are not typically covered in pre-licence training.

While this review focuses on young novice drivers, driver training programs can target other populations. Many evaluations have examined groups with higher crash rates, including teenagers (Stock et al., 1983), older drivers (Cassavaugh and Kramer, 2009) or repeat offenders (Ker et al., 2005). Although these groups may have similar crash rates the reasons underlying their elevated crash risks varies between groups (Sjögren et al., 1996). Novice drivers' problems are typically attributed to inexperience, risk-taking and overconfidence (Jonah, 1986), whereas problems experienced by older drivers are often attributed to deteriorating physical or cognitive capabilities (Lundberg et al., 1998; Owsley et al., 1998). Given this the review focused on training programs for novice drivers, particularly those aged 25 and younger.

2. Pre-licence driver training

Pre-licence training involves teaching basic driving skills to learners, although the skills targeted can vary substantially between programs. Driving demands both procedural skills and higher-order cognitive skills. *Procedural skills* involve executing a sequence of actions, which may become automated with extensive practice (Schendel and Hagman, 1982), such as vehicle manoeuvring or manipulation of vehicle controls. *Higher-order cognitive skills* involve situation monitoring, assessment, response planning and execution (Pollatsek et al., 2011). Most pre-licence training programs combine procedural and cognitive skills training, but predominantly focus on procedural skills relating to vehicle control. Pre-licence driver training covers many formats, including professional driving instruction, school-based driver education and simulator training.

2.1. Professional driving instruction

Professional driving instruction involves learner drivers receiving individualised training from an accredited instructor. Most people learn to drive through a combination of professional training and supervised practice with a relative or friend (Hirsch et al., 2006; Nyberg et al., 2007). This combination is beneficial; learners who receive both professional and lay instruction are more likely to pass their practical driving test (Nyberg et al., 2007). For skill development, evidence suggests it is optimal to have professional