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Review article

Young Driver Distraction: State of the Evidence and Directions for Behavior Change Programs

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A B S T R A C T

Adolescent drivers are overrepresented in distraction-related motor vehicle crashes. A number of potential reasons for such an elevated risk include driving inexperience, high adoption of communication technology, increased peer involvement, and tendency to take risks, which render young drivers particularly vulnerable. Major legislative efforts in Graduated Licensing Systems that include passenger restrictions have shown positive effects. Restrictions on cell phone use are also being introduced; however, it is challenging to enforce such regulations. This article argues that such contextual, legislative interventions are an essential prevention strategy, but there is an unfilled need to introduce behavior change programs that may target adolescents, parents, and friends. A theoretical framework is applied in which risk and protective factors are identified from research within the contexts of community and jurisdiction. In the literature on distraction, social context and normative influences are key elements used to inform program design for adolescent drivers, with parental monitoring informing interventions targeting parents. Following from this assessment of the message content assessment, the design of strategies to deliver the messages is reviewed. In the current literature, school-based programs, simulations, and Web-delivered programs have been evaluated with supplementary strategies delivered by physicians and parents. Such developments are still at an early stage of development, and ultimately will need controlled implementation and evaluation studies. Of course, there is no likely single approach to prevent adolescent driver distraction. Complementary approaches such as the further development of technological interventions to manage phone use are needed.

IMPLICATIONS AND CONTRIBUTION

This article describes the intervention design process and key research in young driver distraction, and includes selecting target behavior and the audience, theoretically derived strategies, and delivery strategies. Currently graduated driver licensing and technology use and acceptance and parent–adolescent and adolescent–peer interactions are opportunities for further research and exploration.

Young drivers appear to be most susceptible to distraction-related crashes; 16% of all distraction-related fatal crashes in 2008 in the United States (US) are attributed to drivers < 20 years of age, the highest proportion of all drivers [1]. Distraction has been defined as "a specific type of inattention that occurs when drivers divert their attention from the driving task to focus on some other activity" ([2], p. 1). Young drivers are inexperienced compared with older drivers, and this inexperience potentially extends to a reduced ability to judge driving demands in relation to other potentially distracting tasks [3].

Many reasons are proposed to explain the proportionally higher rate of distraction-related crashes among young drivers. For example, their inexperience means they necessarily allocate

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greater attention to aspects of driving that may later become automatic, which leaves fewer attentional resources available for secondary tasks [4]. In addition, it has been suggested that adolescent inexperience is associated with lower comprehension of driving safety, risk, and consequence, and less fully developed processing capabilities aligning with the stage of development [5]. The development of regulatory competence involving the prefrontal cortex rapidly grows during adolescence [5] and enhances an individual's ability to accomplish tasks despite major distractions [6]. Lee [7] pointed to the adoption of technology, susceptibility to peer pressure, and tendency to take risks, as factors rendering young drivers vulnerable to distracted driving situations. Despite these risks, research has also shown that young drivers express greater willingness to undertake distracting tasks while driving than do older adults [8]. Such effects may be compounded if the driver is impaired, perhaps by fatigue, alcohol, or drug use.

The behavioral science approach to intervention identifies a number of components for effective program design, including the selection of target behaviors, target individuals, risk and protective factors that underpin such target behavior (theoretically derived), and implementation strategies appropriate to the target audience [9,10]. The program design components are followed by implementing, evaluating, and monitoring the newly constructed behavior change program [10]. This review describes the application of this process specifically applied to reducing adolescent distracted driving. Figure 1 provides an overview of the process.

Identifying the Target Behavior and Identifying the Target Individual

To begin the process of identifying the target behavior for change, an initial objective is clearly specified. A clear objective enables program material to be designed with a common purpose and outcomes measured against the objective. After a broad objective is specified, specific goals are identified that are related to the objective. For example, from the broad objective of "reducing injury from motor vehicle crashes to adolescent drivers who were engaged in a secondary, distracting task" a behavioral goal could be "preventing adolescents from sending text messages while driving." The specific goal or goals are selected based on evidence supporting the link between the goal behavior and the broad objective [10], and are thus measurable. Related to the specification of a target behavior is specification of the target group of individuals who perform such a behavior. Much research on adolescents driving while distracted has focused on distractions by peer passengers and cell phone use.

Extensive research literature has identified an increased safety risk for adolescent drivers associated with carrying peer passengers [11,12]. Carrying young passengers is generally associated with an increased crash risk among adolescent drivers [13]. However, carrying adult passengers is associated with a reduced risk of crashes [14]. Observations of vehicles exiting high school parking lots showed that the adolescent male driver–male passenger combination had greater than double the rate of risky driving than a general traffic group [15]. Self-report studies involving young drivers have shown that many admit to finding their friends a distraction in the car. One study found that almost all adolescents (94%) from a large sample of high school students across the US reported being distracted by passengers [16]. There are sub-groups of young drivers who may be more likely to be distracted than others: for example, males [11]. An examination of sex differences using data from the National Motor Vehicle Crash Causation Survey of crash data showed that distraction, both external and internal (with female passengers), and passengers' risk-promotion were implicated in young male driver crashes. Female young drivers were primarily influenced by distractions such as turning to look at their passengers and other internal distractions [17]. Adolescents who demonstrate impaired attention in other areas of life, such as those diagnosed with attention-deficit hyperactivity disorder, also show impaired driving behaviors [18].

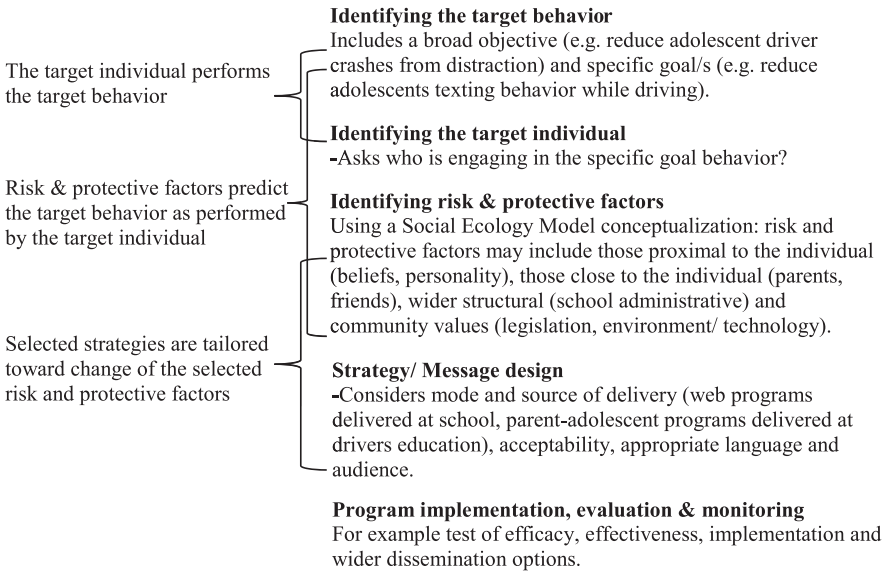

Figure 1. Design process of a behavior change program.