



The effect of male teenage passengers on male teenage drivers: Findings from a driving simulator study

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ABSTRACT

Studies have shown that teenage drivers are less attentive, more frequently exhibit risky driving behavior, and have a higher fatal crash risk in the presence of peers. The effects of direct peer pressure and conversation on young drivers have been examined. Little is known about the impact on driving performance of the presence of a non-interacting passenger and subtle modes of peer influence, such as perceived social norms. The goal of this study was to examine if teenagers would engage in more risky driving practices and be less attentive in the presence of a passenger (vs. driving alone) as well as with a risk-accepting (vs. risk-averse) passenger. A confederate portrayed the passenger's characteristics mainly by his non-verbal attitude. The relationship between driver characteristics and driving behavior in the presence of a passenger was also examined. Thirty-six male participants aged 16–17 years old were randomly assigned to drive with a risk-accepting or risk-averse passenger. Main outcomes included speed, headway, gap acceptance, eye glances at hazards, and horizontal eye movement. Driver characteristics such as tolerance of deviance, susceptibility to peer pressure, and self-esteem were measured. Compared to solo driving, the presence of a passenger was associated with significantly fewer eye glances at hazards and a trend for fewer horizontal eye movements. Contrary to the hypothesis, however, Passenger Presence was associated with waiting for a greater number of vehicles to pass before initiating a left turn. Results also showed, contrary to the hypothesis, that participants with the risk-accepting passenger maintained significantly longer headway with the lead vehicle and engaged in more eye glances at hazards than participants with the risk-averse passenger. Finally, when driving with the passenger, earlier initiation of a left turn in a steady stream of oncoming vehicles was significantly associated with higher tolerance of deviance and susceptibility to peer pressure, while fewer eye glances at hazards was linked to lower self-esteem. While the results of this study were mixed, they suggest that the presence of a teenage passenger can affect some aspects of teenage driver behavior even in the absence of overt pressure and distraction. Results are discussed in relation to theoretical concepts of social influence and social facilitation models.

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1. Introduction

Teenagers are over-represented in a variety of risky behaviors (Arnett, 1996; Jonah, 1990), and peer presence and influence have often been associated with higher involvement in these behaviors. For example, smoking (Simons-Morton and Farhat, 2010) and drinking (Borsari and Carey, 2001) are more common among teenagers and young adults when their friends engage in these behaviors. Also, teenage drivers accompanied by teenage passengers are more frequently involved in fatal crashes (Chen et al., 2000;

Ouimet et al., 2010). Traffic crashes represent the main cause of morbidity and mortality for teenagers (World Health Organization, 2009) and are one of the most serious consequences of negative peer influences. A better understanding of teenage passenger and driver interactions could help guide development of traffic injury prevention efforts.

Risky driving and inattention (due to distraction), which can be affected by teenage passengers, are two of the main behaviors preceding crashes among young drivers (Curry et al., 2012; McKnight and McKnight, 2003). While peer presence is commonly associated with risky behavior, its effect on inattention is probably unique to driving compared to other types of risky behavior. Most observational and experimental studies have shown that the presence of teenage passengers is associated with higher

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involvement in: (i) risky driving practices such as speeding (Shepherd et al., 2011; Simons-Morton et al., 2005; Toxopeus et al., 2011), shorter headway (Simons-Morton et al., 2005), lower safety belt use (Williams et al., 2003); and (ii) inattention such as higher “looked-but-failed-to-see” driving errors (White and Caird, 2010), lower identification of and reaction time to hazardous situations (Gugerty et al., 2004), and more driving errors (Rivardo et al., 2008; Toxopeus et al., 2011). Some epidemiological and observational studies have found stronger negative effects when both the driver and passenger were males (Chen et al., 2000; Ouimet et al., 2010; Simons-Morton et al., 2005). Other studies, however, have indicated beneficial or no effects of passengers. Lower risky driving practices were found for teenage drivers traveling with peer passengers in a naturalistic study (Simons-Morton et al., 2011) and faster reaction times were observed during simulated driving (Toxopeus et al., 2011). Some experimental studies focusing on distraction found no difference between driving with a passenger and driving alone (Drews et al., 2008) or performance deterioration when young drivers were accompanied by a passenger who was talking to them, but not when the passenger was silent (Rivardo et al., 2008; Toxopeus et al., 2011). While many studies demonstrate elevated risk in the presence of teenage passengers, the existence of mixed results suggests that there might be specific conditions under which teenage driving risk is increased or decreased in the presence of passengers.

Another important question is whether both peer influence and distraction affect teenage driving while in the presence of teenage passengers. Most experimental studies have assumed that either peer influence leads to risky driving practices (Oei and Kerschbaumer, 1990; Shepherd et al., 2011) or that distraction results in inattention (Gugerty et al., 2004; Rivardo et al., 2008; Toxopeus et al., 2011; White and Caird, 2010). Both peer influence and distraction could occur under the same circumstances, however. For example, in research on the effects of distraction on driver performance during which study confederates engaged participants in a conversation (Gugerty et al., 2004; Rivardo et al., 2008; Toxopeus et al., 2011; White and Caird, 2010), effects on driver behavior could also be attributed to perceived social norms conveyed by the passengers. Similarly, if the confederate applies direct peer pressure on the teenager to engage in a risky behavior (Shepherd et al., 2011), there could also be an effect of distraction. It appears that both peer influence and distraction can play a role and their effects could be addressed in the same research design.

Finally, most experimental studies have focused on the effect of peer pressure, though other modes of peer influence may be involved. In general, peers can influence behavior by directly encouraging or discouraging it or by modeling the behavior. They can also influence behavior through their general attitude, expectations, and judgments by suggesting how normative and acceptable a behavior is (or perceptions of peer social norms) and thereby promoting or discouraging a particular behavior. The intensity of these modes of peer influence can also vary. Influences can be direct, such as through verbal and overt non-verbal expressions of encouragement (or discouragement). Influences can also operate indirectly through social norms, which can be transmitted through modeling and verbal and non-verbal actions. In the adoption of smoking, the indirect effect of peers appears to be more important than direct pressure (Nichter et al., 1997), but both processes have been demonstrated in other studies (Simons-Morton and Farhat, 2010). With respect to driving, a pilot study conducted by our research group indicated that 70% of the participants reported that the presence of a teenage passenger (who is in the vehicle, but not talking) impacted their driving performance compared to 25% who reported that direct peer pressure (comments made to the driver) played a role (Ouimet, 2009). These results contrast with those of experimental studies showing no effect of a silent

passenger (Rivardo et al., 2008; Toxopeus et al., 2011) but significant effects on increased risky driving behavior of a confederate expressing peer pressure verbally before the driving session (e.g., Oei and Kerschbaumer, 1990). If most of the influence of peer presence leading to increased risk is through perceived social norms and less through direct peer pressure, more research is needed on the role of subtler modes of peer influence on increased risky driving practices and inattention, such as social norms conveyed by a non-interacting passenger.

Some models, such as peer influence and social facilitation, can help explain the required conditions for increased or decreased risky driving practices and inattention in the presence of a passenger and reconcile some of the discrepant findings in the literature. The conceptual model of peer influence proposed by Brown et al. (2008) suggests that four elements are involved in peer influence in teenagers: an event, activation of peer influence, a response, and generation of a measurable outcome. Thus, when applied to the passenger effect, the presence of a teenage passenger in a vehicle driven by a teenager would activate peer influence that can be accepted/acceded, rejected/ignored, or countered by the driver. The selected response may affect risky driving and inattention. The effect of peers on risky driving practices and inattention can also be explained by social facilitation models, which posit that, in the presence of others, the performance of an easy and familiar task is enhanced whereas the performance of a complex and unfamiliar task is degraded (Zajonc, 1965). A meta-analysis of the evidence in support of this perspective concluded that the presence of others is associated with higher speed and accuracy for the completion of simple tasks and lower speed and accuracy for complex tasks (Bond and Titus, 1983). The effect of the presence of others is postulated to be due to increased arousal (Guerin, 1986; Zajonc, 1965) that can be generated by apprehension of being evaluated by others (Cottrell et al., 1968) or increased cognitive load and distraction if the participant's attention is divided between the demands of the task and the social situation (Baron and Kenny, 1986; Sanders and Baron, 1975). The presence of others can also have an effect if a person's attention is focused on reducing the difference between their behavior and perceived conformity to norms (Carver and Scheier, 1981). Applied to driving, it could mean that if the presence of a passenger is meaningful to the driver, it could affect risky behavior and attention as a function of the difficulty and complexity of the task. In summary, the effect of the presence and influence of peer passengers might be more complex than previously known.

Both peer influence and social facilitation models have often ignored individual factors in their explanation of the effects of peers (Brown et al., 2008; Uziel, 2007). Nevertheless, a systematic review of social facilitation models found that participants' characteristics were more important moderators of the effects of the presence of others on performance than the complexity of the task (Uziel, 2007). This review also pointed out performance improvement for people with positive-self-assured attributes (e.g., high self-esteem) and performance impairment for those with negative-apprehensive attributes (e.g., low self-esteem). From the peer influence purview, both driver and passenger factors are considered to moderate the response to peer influence (e.g., accepting and refusing). These factors include male sex (Cooper et al., 1979; Simons-Morton et al., 2005), high sensation seeking (Slater, 2003), openness or susceptibility to peer influence (Brown et al., 2008), peer characteristics such as sociability (Collins et al., 1985), and having friends who are involved in risky behavior (Shope et al., 2003; Simons-Morton et al., 2011). It is then important to investigate the influence of driver and passenger individual characteristics on driving performance.

In summary, a better understanding of how peers affect teenage driver behavior, the nature of the processes underlying the effects of peers, and the role of teenagers' characteristics could help guide the

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