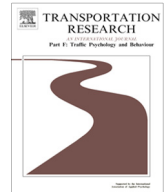




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## Self-reported engagement in driver distraction: An application of the Theory of Planned Behaviour



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### ABSTRACT

Driver distraction is a significant concern for roadway safety. As drivers often engage willingly in secondary tasks, it is crucial to understand the social-psychological factors underlying these behaviours. A useful framework for understanding these factors is the Theory of Planned Behaviour (TPB). This paper investigates the efficacy of TPB in predicting self-reported engagement behaviour in a number of distraction tasks through the assessment of attitudes, perceived behavioural control, descriptive norms, and injunctive norms. This work also investigates the relation of self-reported distraction engagement with personality traits and other unsafe driving behaviours. Data collection utilised the Susceptibility to Driver Distraction Questionnaire (SDDQ), which was built with TPB as the framework, as well as the Manchester Driver Behaviour Questionnaire (DBQ) and various personality questionnaires. A total of 578 drivers, both genders, ages 18+, were surveyed. Self-reported distraction engagement was associated with impulsive, venturesome, and sensation seeking personalities, and with reportedly higher level of unsafe driving behaviours. Further, attitudes, perceived behavioural control, and descriptive norms were found to be significant predictors of self-reported engagement after controlling for age group and gender. Injunctive norms, which describe the perceived expectations of what the driver ought to do, were not significant. Gender was not significant in predicting engagement, but older drivers (60+) reported a marginally lower level of engagement than drivers between the ages of 26 and 39. Our findings demonstrate the usefulness of TPB for analysing self-reported distraction engagement, and suggest that drivers may be more heavily influenced by what other drivers do on the road, rather than what they perceive they ought to do, when it comes to engaging in distractions.

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### 1. Introduction

The National Highway Traffic Safety Administration (NHTSA) reported that approximately 3154 crash-related fatalities (10% of all fatal crashes) and 424,000 injuries (18% of injury crashes) in 2013 were distraction affected ([National Highway Traffic Safety Administration, 2015](#)). Furthermore, an Australian national crash study identified over 70% of distractions to be voluntary, including the use of mobile phones, adjusting in-vehicle systems, and interacting with passengers

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(Beanland, Fitzharris, Young, & Lenné, 2013). It is therefore important to understand the social and psychological aspects that guide drivers' willingness to engage in these voluntary distractions. However, these aspects remain relatively little studied despite the mounting evidence of detrimental effects of distractions on driver performance (e.g., Beanland et al., 2013; Horberry, Anderson, Regan, Triggs, & Brown, 2006; Ranney, 2008; Wierwille, 1993; Young, Regan, & Hammer, 2007).

Horrey and colleagues led the efforts in understanding social-psychological factors associated with voluntary distractions by conducting surveys as part of a laboratory study, which evaluated training as a means to mitigate driver distraction (Horrey & Lesch, 2008; Horrey, Lesch, Kramer, & Melton, 2009). In this study, 40 participants were surveyed on their willingness to engage in driver distractions before and after receiving a video-based training intervention. The researchers collected data on demographics, personality (sensation seeking, impulsivity, and anger), cognitive failures, and opinions regarding various in-vehicle distractions. The study found that self-reported willingness to engage in driver distraction was associated with past behaviour, confidence in dealing with distractions, perceived risk of distractions, and tendencies towards sensation seeking (Horrey & Lesch, 2008). Drivers in the training group, but not the control group, showed a decline in their self-reported willingness to engage in distracting activities along with a corresponding increase in perceived risk (Horrey et al., 2009). These findings provide important insights towards the psychology of drivers around distractions.

In this paper, we aim to further investigate the social and psychological factors that underlie voluntary driver distractions. To this end, we report a survey study with a sample size of 578 respondents and data collected on demographics, personality, engagement in risky driving behaviours, and perceptions and behaviours about distractions. In this survey, we adopted the Theory of Planned Behaviour (Ajzen, 1991), a widely used framework from the social sciences, for understanding perceptions and behaviours about driver distractions.

### 1.1. Theory of Planned Behaviour

The Theory of Planned Behaviour (TPB) stipulates that behaviour extends from intent, which in turn is a product of social-psychological constructs of attitudes, subjective norms, and perceived behavioural control (Ajzen, 1991). More specifically, *attitudes* refer to the (positive or negative) evaluation of the expected outcomes following the behaviour in question. *Subjective norms* describe the perceived pressure or expectation from others to commit the particular behaviour. *Perceived behavioural control* is the belief of how well one is able to carry out the particular behaviour. Ajzen's theorized relationships between behaviour, intention, and these three social-psychological constructs are shown in Fig. 1a (Ajzen, 1991).

As a model for predicting social behaviour, TPB has been widely applied in fields as diverse as preventive healthcare, such as smoking (e.g., Conner, Sandberg, McMillan, & Higgins, 2006) and alcohol consumption (e.g., Huchting, Lac, & LaBrie, 2008), as well as education (e.g., cheating, Mayhew, Hubbard, Finelli, Harding, & Carpenter, 2009) and marketing research (e.g., customer satisfaction, Liao, Chen, & Yen, 2007). TPB has also received increasing attention in road safety, where driving violations are often intentional. For instance, TPB has been found useful for understanding speeding (e.g., Paris & den Broucke, 2008; Warner & Åberg, 2006), drinking and driving (e.g., Chan, Wu, & Hung, 2010; Moan & Rise, 2011), and aggressive driving behaviours (e.g., Forward, 2009; Iversen, 2004; Parker, Manstead, Stradling, & Reason, 1992).

Forward (2009) sampled 275 drivers to study their intentions to commit two driving violations: speeding in an urban area and dangerous overtaking. In addition to the TPB constructs, the author included another norm-related variable in her study: descriptive norms. In contrast with injunctive norms ("What I think others expect me to do") prescribed in TPB, descriptive norms describe an individual's beliefs about other people's behaviour (what is done) rather than what ought to be done. The study found descriptive norms to make a unique contribution towards the prediction of the two driving violation intentions. Both forms of norms have also been studied in the context of driving violations, outside the TPB framework (e.g., for injunctive norms, see Elliott, Armitage, & Baughan, 2003; for descriptive norms, see Åberg, Larsen, Glad, & Beilinson, 1997 and Haglund & Åberg, 2000; for discussions of both, see Cestac, Paran, & Delhomme, 2011 and Paris & den Broucke, 2008). However, it should be noted that literature often does not differentiate between the two types of norms and the term social norms may refer to either, depending on the study. In our survey, we explicitly defined and included both injunctive and descriptive norms in order to differentiate their potential influence on driver distraction engagement.

Compared to driving violations such as speeding, the use of TPB is relatively new for driver distraction research, and majority of the work in this area focuses on cell phone usage while driving, such as the work by Walsh and colleagues (Walsh, White, Hyde, & Watson, 2008; White, Hyde, Walsh, & Watson, 2010). Among other findings, these authors found that attitudes and pressure from significant others (injunctive norms) regarding the use of cell phones (i.e., calling and texting) while driving were significant predictors of a driver's intention to do so. In this paper, we apply TPB to a broader range of distractions using an online survey.

### 1.2. The present study

Lee, Young, and Regan (2008) define driver distraction as the diversion of attention away from activities critical for safe driving toward a competing activity. This definition suggests that competing activities become distractions only when they interfere with safe driving. In this paper, we adopt a broader definition of driver distraction given by the U.S. Department of Transportation, which states that driver distraction is "any activity that could divert a person's attention away from the primary task of driving" (National Highway Traffic Safety Administrations, n.d.). It is important to note that while distraction is a concern for driver safety in general, within our adopted definition, not all distractions necessarily lead to an increased crash

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