



Integrating the theory of planned behavior and behavioral attitudes to explore texting among young drivers in the US



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ABSTRACT

The proliferation of cell phones and the growing culture of constant connectivity has introduced a plethora of new challenges for mobile citizens. One of the major challenges transportation professionals desire to address involves the use of cell phones to text while driving, especially for less experienced drivers. In this study, the Theory of Planned Behavior (TPB) in conjunction with psycho-social factors is utilized to explore the intention to text while driving among young drivers. The results of a survey administered to 524 drivers suggest that the TPB constructs (attitude, subjective norm, and perceived behavioral control) along with the perceived disadvantages of abstention and age of the driver explain a significant amount of variance in the intention to send text messages while driving (adjusted $R^2 = 0.71$).

1. Introduction

According to the Pew Research Center, 95% of Americans own a cell phone. The share of Americans who own smartphones is now around 77%, up from just 35% in Pew Research Center's first survey of smartphone ownership conducted in 2011 (Pew Research Center, 2018). The extant literature highlights the diverse benefits of mobile technology (Wareham, Busquets, & Austin, 2009), from increased organizational fluidity (Chatterjee, Sarker, & Siponen, 2017) to more effective health interventions (Carter, Corneille, Hall-Byers, Clark, & Younge, 2015). However, in light of the widespread adoption of smartphones, texting while driving (TWD) has emerged as a significant challenge to law enforcement and transportation safety (Bazargan-Hejazi et al., 2017). Distracted driving has received a lot of attention from both researchers and practitioners. From perceptions on moral norms (Kim, 2018) to the characteristics of college students who text while driving, studies have explored a plethora of challenges associated with driver safety in the digital age (Parnell, Stanton, & Plant, 2018).

While there are many forms of distracted driving (e.g., talking to passengers in the car, manipulating entertainment or navigation system controls, grooming, eating and drinking), TWD is particularly concerning because it involves all three of the primary forms of distraction: manual (taking the hands off the steering wheel to key in characters on

the cell phone keypad), visual (taking the eyes off the road to look at the cell phone screen), and cognitive (taking the mind off the driving task to think about what was or should be communicated in a text). Information systems research has explored the impact of distractions on an individual's cognitive ability and performance (Jenkins, Anderson, Vance, Kirwan, & Eargle, 2016); however, the impact of texting while driving has received minimal attention in the IS domain.

Texting while driving (TWD) continues to be a growing problem among young drivers. AT&T's Teen Driver Survey revealed that 97% of teens agree that TWD is dangerous, yet 43% do it anyway (Thomas, Zuckman, & Beck, 2012). In a study published in Pediatrics in 2013, 44.5% of the teenage survey respondents admitted to TWD at least once during the past month (Olsen, 2013). In a 2015 report published by the AAA Foundation, cell phone use was determined to be the second most common form of distracted behavior teenage drivers were engaged in right before they crashed (Green, 2015). Specific to TWD, Terry and Terry (2015) found that the more college students engage in texting or have thoughts of TWD, the more likely they are to experience near-accidents than college students who engage in such behaviors or have such thoughts less frequently.

Since texting is one of the most common cell phone operations performed by young drivers (Atchley, Hadlock, & Lane, 2012), it is important that the factors influencing their intention to engage in this

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risky behavior be determined. Research indicates that even when legislation is enacted to ban this behavior, young drivers continue to text while driving (Curran, Graham, & Burk, 2019). A better understanding of the factors that influence TWD will help government agencies and private organizations craft campaigns and design messages that effectively deter this behavior. As such, this research is believed to be important for advancing safe driving behavior.

In general, there is an abundance of research on the societal challenges associated with distracted driving (Endsley, 1995; Horrey, Lesch, & Garabet, 2008; Olsen et al., 2013; Rosenbloom, 2006; Walker, Stanton, & Young, 2008). To date, few studies have integrated the Theory of Planned Behavior (TPB) with behavioral attitudes to explore the intention to text while driving among young drivers (Bazargan-Hejazi et al., 2017; Gupta, Burns, & Boyd, 2016). Feldman, Greeson, Renna, and Robbins-Monteith (2011) state that “identifying potential psychological, behavioral, and environmental factors that predict texting-while-driving may help to guide the development of interventions that target relevant processes” (p. 856). Berenbaum, Harrington, Keller-Olaman, and Manson (2019) also highlight the need for more research on predictors that can be used to discourage young drivers from texting while driving.

The theory of planned behavior (TPB; Ajzen, 1991), a theoretical framework and successful model of health behavior, has previously been used to evaluate diverse traffic safety contexts, such as road violations (Castanier, Deroche, & Woodman, 2013) and the precarious road-crossing behavior of pedestrians (Zhou, Horrey, & Yu, 2009). TPB has also been used to explore the psychosocial factors that influence drivers' cell phone use behaviors (Bazargan-Hejazi et al., 2017; Gauld, Lewis, White, Fleiter, & Watson, 2017; Nemme & White, 2010; Walsh, White, Hyde, & Watson, 2008; Zhou, Horrey et al., 2009). Nelson, Atchley, and Little (2009) and Atchley, Atwood, and Boulton (2011) found that younger adults rated distracted driving (talking on a cell phone and texting) as dangerous behaviors, but that rating had little to no impact on their own driving behavior. Based on these findings, TPB is utilized to explain the intention of young drivers to text while driving.

This study builds on the existing literature by developing a research model that integrates TPB with Hafetz et al.'s (2010) analytical framework of the perceived advantages and disadvantages of abstaining from cell phone use while driving. The perceived advantages of abstention from TWD construct suggests there are benefits to not TWD (i.e., arriving safely, adhering to laws, pleasing parents, etc.), while the perceived disadvantages construct captures the negative implications of abstention from TWD (in other words, *not* TWD prevents young drivers from interacting with their social circle in a timely manner).

Furthermore, young drivers are the focus of this study as this population is particularly vulnerable to the dangers of distracted driving (NHTSA, 2017; TeenSafe, 2017). Hence, this study makes several important contributions to the literature: 1) utilizing TPB as the theoretical foundation, a parsimonious model of factors that influence TWD is presented; 2) TPB is extended to include user perceptions of the specific advantages and disadvantages of the specific cell phone behavior of interest (TWD); and 3) the proposed model is tested among a particularly vulnerable population, namely young drivers. Young drivers are here defined as individuals between the ages of 15 and 21 years old, inclusively.

2. Conceptual development

One of the most prevalent social science theories utilized to connect beliefs and behavior is the Theory of Planned Behavior (TPB) (Ajzen, 1991). According to TPB, subjective norms, perceived behavioral control, and attitude affect behavioral intention, which in turn affects actual behavior (Fishbein & Ajzen, 1975). Perceived behavioral control refers to the ease or difficulty of an individual to control his/her behavioral performance in a particular domain. Subjective norms refer to

social pressures to conform to certain behaviors. The attitude construct refers to affective feelings toward the behavior in question.

Numerous studies highlight the usefulness of TPB in explaining intention and behavior for various domains (Armitage & Conner, 2001; Nemme & White, 2010). With regards to drivers' cell phone use, Walsh et al. (2008) and Zhou, Wu, Rau, and Zhang (2009) found that TPB explained a significant portion of the variance in the intention to use a hands-free and hand-held cell device, respectively. Bazargan-Hejazi et al. (2017) similarly employed TPB to understand the texting behavior of college student drivers. They found that intention to text while driving mediates the relationship between perceived behavioral control and willingness to text while driving. Atchley et al. (2012) posit that “the intention to perform a behavior, such as using a cellular device while driving, is influenced directly by perceived norms, as well as attitudes and perceived control over the behavior” (p. 280). Perceived behavioral control involves the person's view of how easy or difficult it is to perform the behavior in question. Factors such as previous experiences and obstacles that must be overcome to perform the behavior often influence this view (Gauld, Lewis, & White, 2014). The presence of control suggests that young drivers who maintain an orientation of some degree of control over TWD may be more likely to abstain from TWD.

Subjective norm relates to the social pressure that an individual views to be associated with the performance of the behavior (Ajzen, 1991) as well as the individual's perception of others' expectation that they will follow set standards (Finlay, Trafimow, & Moroi, 1999). As such, young drivers maintain the belief that engaging in TWD is expected among their peer group and that they must adhere to such norms to maintain their status within their group. Therefore, the presence of social pressure would suggest that young drivers will maintain the view that TWD is a behavior to be engaged in.

With regard to the attitude behavioral orientation, this refers to an individual's assessment of how positive (high attitude) or negative (low attitude) the prospective behavior might be (Ajzen, 1991). In the case of TWD, both positive and negative external influences (in terms of parents, peers, etc.) are evaluated against one another to determine in which behavior to engage. Attitude can be perceived through various lenses. In this study, attitude is viewed in terms of whether the individual thought positively or negatively of the behavior in question (i.e., TWD). A low general TWD attitude score would suggest that the individual did not see a problem with TWD, while a high general TWD attitude score would indicate the opposite. Grounded in TPB, the following three hypotheses are proposed:

Hypothesis 1. Perceived Behavioral Control will increase Intention to Text While Driving

Hypothesis 2. Subjective Norms will increase Intention to Text While Driving

Hypothesis 3. General TWD Attitude will decrease Intention to Text While Driving

In addition to TPB, Hafetz et al.'s (2010) perceived advantages and disadvantages of abstaining from cell phone use while driving are included to present a more comprehensive view of this phenomenon. According to Hafetz, Jacobsohn, Garcia-Espana, Curray, and Winston (2010), “uncovering the factors that lead to engaging in or abstaining from [cell phone use while driving] can be helpful in designing effective health promotion strategies. For example, health messages could be designed to communicate positive alternatives or negative consequences, to debunk myths, or to pursue other persuasion strategies, as needed. Such messages should focus on the areas with the strongest association with the target behavior(s) (p. 1571).” Hafetz et al. (2010) used the National Young Driver Survey (Ginsburg et al., 2008) to investigate the relationship between prominent behavioral factors and cell phone use while driving among young drivers. They found that stronger beliefs about the benefits of abstention from cell phone use

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