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Preliminary research developing a theory of cell phone distraction and social relationships

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ABSTRACT

Motor vehicle crashes remain the leading cause of death and injury for people aged 5–34, accounting annually for over 3000 deaths, and 100 times as many injuries. It is well established that distracted driving, and cell phone use while driving in particular, pose significant crash risk to drivers. Research has demonstrated that drivers are well aware of this danger but over 90% of drivers report using a cell phone while driving. Given the likely role that social influence plays in how people use cell phones while driving surprisingly little research has been conducted investigating to whom drivers are talking or texting. We report the results of a national survey to determine who drivers are most likely to call or text when behind the wheel and compared these results with general cell phone calling and texting patterns as well as previous findings on the prevalence of calling and texting while driving. The results suggest that social distance is a key factor in cell phone use while driving: Teens are more likely to talk with parents, and adults are more likely to talk with spouses than general calling patterns would suggest. We discuss whether the purpose of calls made while driving, such as coordination, could help explain these patterns. We propose next steps for further examining the role social relationships play in cell phone use while driving to potentially reduce teen driver cell phone use by lowering the number of calls from parents.

1. Driving and cell phone distraction

There is an apparent disconnect between the perception of using a cell phone while driving as dangerous and the persistence of engaging in this behavior. It is well established that distracted driving, and cell phone use in particular, pose significant crash risk to drivers. Epidemiological data from the Fatality Analysis Reporting System (FARS), which includes a code for reporting cell phone use (no distinction between talking and texting) provides a reasonably accurate estimate of whether a cell phone was actually in use at the time of the crash. Results from 2011 indicate that at least 10% of fatal crashes (resulting in 3331 deaths) and 17% of injury crashes (resulting in 387,000 injured) were the result of distracted driving. Of those, 12% of the distraction-related fatal crashes and 5% of distraction-related injury crashes included a driver using a cell phone. In total, 21,385 severe accidents in 2011 involved a driver who was using a cell phone. For teen drivers the rate of cell phone use in fatal crashes was considerably higher with 21% involving a driver between the ages of 15 and 19 using a cell phone (NHTSA, 2013).

A Pew survey conducted in 2009 showed that 43% of teen drivers said they had talked on a cell phone while driving and 26% of teens reported sending texts while driving (Madden and Lenhart, 2009). The Centers for Disease Control and Prevention's 2011 National Youth Risk Behavior Survey reported that 45% of teens over the age of 16 had texted while driving at least once in the past 30 days (Olsen et al., 2013). A 2012 survey of high schools students conducted by Liberty Mutual and Students Against Destructive Decisions (SADD) found that 90% of 11th and 12th grade students reported talking on a cell phone while driving and 78% reported texting while driving. Teens also reported that their parents use cell phones (91%) and text (59%) while driving (Liberty Mutual and SADD, 2012).

Data from experimental studies confirm that cell phone conversations cause inattention blindness and impair driving because drivers withdraw their attention from the road (Strayer and Johnston, 2001; Strayer et al., 2003). Further, texting while driving is associated with increased variability of speed and lane position (Narad et al., 2013; Stavrinos et al., 2013). Whether a phone is hands-free or not, drivers talking on a cell phone are four times as likely to be involved in a crash (IIHS, 2006; Brace et al., 2007)

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and texting is no safer with a hands-free system than holding a cell phone (Owens et al., 2011).

Recent on-road observational studies provide further opportunity for examining cell phone use and driving in a more natural setting. Instrumented vehicles recorded over 1600 teen driver crashes (Carney et al., 2015). Prior to these crashes, 58% of the teen drivers engaged in a distracting behavior, most commonly interacting with a passenger (15%) or using a cell phone (12%). Klauer et al. (2014) studied the relationship between cell phone use and crash risk using instrumented vehicles and found that dialing and reaching for a cell phone and sending and reading text messages significantly increased the risk of a crash or near-crash among newly licensed teen drivers. However, Young (2015) provides an updated analysis of the 100-Car driving study that finds talking on a cell phone was not associated with increased risk of a crash (see also, Victor et al., 2015, for further analysis and discussion of this issue). While there is utility in considering the relative risk of the constituent parts of using a cell phone while driving (e.g., dialing, conversing), the research is clear that the overall act of using of a cell phone while driving compromises the safety of the driver, passengers and other road users, and that teens engaging in this behavior are at higher crash risk than adults.

Using a cell phone while driving is perceived by many drivers as socially acceptable despite the recognized dangers of distracted driving. The AAA Foundation for Traffic Safety's most recent traffic culture survey showed strong social disapproval for using a phone while driving with 66% of respondents saying it is somewhat or completely unacceptable (AAAFTS, 2013). Many drivers believe that talking on a cell phone is dangerous and that other drivers who do this are a threat to their safety (AAAFTS, 2013, 2010). Drivers also feel that texting and emailing is more dangerous than talking on a cell phone with 92% saying it is unacceptable to text or email while driving. Despite this, 27% said they had personally texted or emailed while driving in the last 30 days and 34% said they had read a text or email while driving in the last 30 days. And among a sample of young drivers with high rates of phone use while driving the perception of risks associated with texting and driving only weakly predicted avoiding this behavior (Nelson et al., 2009).

In order to understand the relationship between cell phone use and driving we need to first consider the relationship between a driver and the person they are communicating with. Normal call patterns, regardless of driving, show 30 percent of teens ages 12–17 who own a cell phone make calls several times a day to their friends, parents, and boyfriends/girlfriends (Lenhart et al., 2010). The majority of teens (68%) call their parents every day while just half of these teens call friends every day. Teens report sending texts several times a day to friends (75%), boyfriends/girlfriends (40%) and parents (24%). Teens are more likely to call parents than text them and are more likely to text friends than call them. Blackman (2010) examined cell phone patterns in a sample of college students ages 18–21 using call logs recorded in the students' cell phones over the course of one week. Overall students called and texted their friends the most, followed by boyfriends/girlfriends, and finally parents. Similar to teens, college students were more likely to call parents than text them. However there were no differences in whether students called or texted friends and boyfriends/girlfriends. Not surprisingly, adults also call and text friends and family the most (Wajcman et al., 2008). Analysis of actual calling records indicate that 26% of calls and texts are with their friends, 18% with their spouse, 12% with their parents, and 11% with their children. Work-related contacts make up 16% of adult cell phone calls and texts.

While it may be reasonable to expect similar calling patterns whether or not a person is driving, this issue has been largely ignored. Research has shown that college students are more likely to answer a call when driving if they feel it is important (Nelson et al., 2009). Similarly, Atchley and Warden (2012) found that young adult drivers were very reluctant to delay responding, particularly to calls and texts from people to whom they are socially close. Neither of these studies provides a detailed look at who drivers are calling and texting and their social relationships. Thus, it is unknown whether calling and texting patterns vary from normal patterns during driving. Similarly, relatively little is known about who drivers communicate with while driving. As a result there is insufficient data to develop a psychological explanation about social relationships and cell phone distraction while driving. Such a theory is sorely needed to form useful, testable hypotheses and to provide a foundation for effective interventions.

We set out to describe calling patterns among both novice teen drivers and experienced adult drivers because these groups show differences in their use of cell phone technologies while driving (Madden and Lenhart, 2009; Olsen et al., 2013; Liberty Mutual and SADD, 2012), calling patterns (Lenhart et al., 2010; Wajcman et al., 2008) and driving safety (NHTSA, 2013). As a first step we designed an exploratory study to investigate with whom teens and adults are most likely to talk and text while driving. Interviews with a small sample of drivers were used to define a short list of the most common relationships between drivers and the people with whom they talk/text. The results of the interviews informed the design of a survey administered to a national sample of teens and adults. The results from the survey showed different calling patterns while driving than are expected from general patterns of cell phone use.

2. Method

A mixed methods design, including in-person interviews and a survey, was used to investigate with whom drivers talked and texted while driving. Because little is known about whom they actually communicate with while driving we began with in-depth interviews exploring the patterns of texting and talking with a small sample of teens and adults. The results from the interviews were used to define a comprehensive set of appropriate questions for the larger survey.

2.1. Interviews

Semi-structured interviews were conducted to investigate how often drivers used their cell phone while driving and with whom they talked. Separate instruments were designed for teen drivers and adult drivers because driving experience was expected to impact the use of cell phones and we anticipated that teens and adults may have different social relationships and communication patterns. The goal of the interviews was to determine the prevalence of cell phone use while driving and to identify the people drivers reported talking to or texting with while driving (e.g., spouse, friend, parent).

The teen and adult interview instruments included questions about whether the driver ever used a cell phone to talk or text while driving. Drivers who reported talking or texting while driving were then prompted to describe a recent drive where they engaged in either or both of these behaviors, particularly who they were communicating with.

2.1.1. Participants

Thirteen teens participated in interviews. Four were learner's permit holders (age 15–16), five had a restricted license (age 16–17), and four had an unrestricted license (age 17). Five adults participated in interviews. All adults had an unrestricted license and were between 35 and 62 years of age. All participants lived in California.