

Distracted Driving Among College Students: Perceived Risk Versus Reality

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Abstract Although the rate of alcohol-impaired driving among adolescents has declined in the past two decades, distracted driving has become a major public safety concern. The present study compared perceptions of accident risk and social norms related to cell phone use while driving (CPWD), as well as alcohol-impaired driving, with self-reported behavior among a sample of 726 college students. Results indicated that although participants perceived sending text messages while driving as posing a similar accident risk as driving while legally intoxicated, they were much more likely to text behind the wheel. Furthermore, participants perceived their peers as being more accepting of and having more liberal views toward CPWD than their own, suggesting that one factor underlying the discrepancy between perceived risk and risk exposure may be the level of social acceptability attributed to texting while driving. Future interventions may benefit from focusing not only on risk perception, but on social norms, legal consequences, and adaptive alternatives.

Keywords Cell phone use while driving · Risk perception · Social norms

In the past two decades, cell phone use while driving (CPWD) has become a major threat to driver safety in the United States (Redelmeier and Tibshirani 1997; Wilson and Stimpson 2010). The National Safety Council estimated that, in 2011, 21 % of all

crashes (1.1 million car accidents) involved cell phone conversations and an additional 4 % involved texting while driving (213,000 accidents; NSC 2013). Furthermore, drivers younger than 20 years of age currently represent the age group with the highest proportion of distraction-related traffic fatalities (NHTSA 2010).

Although college students acknowledge significant risks related to CPWD, research has suggested that the social norms associated with CPWD have not shifted out of favor as have those related to drinking and driving (Atchley et al. 2012). Furthermore, research using driving simulators has indicated that talking on a hand-held or hands-free cell phone while driving can result in reaction time delays equivalent to those seen in drivers with a blood alcohol concentration (BAC) at the legal limit of 0.08 % (Strayer et al. 2006). As cell phone ownership has become increasingly prevalent among adolescents, so has the habitual use of text messaging (Oulasvirta et al. 2012), which has been shown to present an even greater accident risk than talking on the phone (Drews et al. 2009). A recent study found that 92 % of college students reported reading text messages while driving, 81 % reported replying to them, and 70 % reported initiating text message conversations from behind the wheel (Atchley et al. 2011). Furthermore, drivers under the age of 25 are two to three times more likely to read or send text messages while driving, and are more likely to initiate phone calls due to boredom (Tison et al. 2011).

A growing body of research has sought to explain engagement in unsafe driving behaviors despite awareness of the associated risks. For example, Vanlaar et al. (2008) tested a conceptual model for predicting one's level of concern regarding various unsafe driving behaviors—including alcohol-impaired driving and CPWD—and found that perceived risk and the perceived level of concern of others best predicted one's personal level of concern. This model suggests that raising one's level of concern with regard to a specific risky

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driving behavior requires not only that an individual perceive the behavior as dangerous, but that one perceive others as being sufficiently concerned about the behavior. Research in a number of areas of health behavior, from alcohol and tobacco use to gambling (Borsari and Carey 2003; Larimer and Neighbors 2003; Terry and Terry 2012), has shown that perceived injunctive social norms (i.e., one's perceptions of how others view a health behavior) play an important role in influencing the likelihood of engaging in high-risk behaviors.

The present study had three primary aims. First, we compared college students' level of perceived accident risk related to driving while legally intoxicated with four types of CPWD including hand-held versus hands-free phone conversations and reading versus sending text messages. Second, we examined attitudes toward CPWD including the degree to which students found CPWD to be socially acceptable among their peers (i.e., perceived injunctive social norms). Third, we assessed self-reported driving behaviors including frequency of driving under the influence of alcohol, frequency of CPWD, and use of risk reduction strategies related to CPWD.

Method

Participants and Procedure

Participants included 726 college students, 18 years or older ($M_{age}=19.2$, $SD=2.0$), who had both a driver's license and a cell phone. The mean age at which participants obtained their driver's license was 16.6 ($SD=1.0$) and the mean number of years of driving experience was 2.6 ($SD=2.1$). The sample was predominately female (61.7 %) and was most representative of first-year students (62.5 %); 16.7 % of participants were sophomores, 12.9 % were juniors, and 7.9 % were seniors. Seventy-six percent of participants identified as European American; 9.1 % were Asian American; 5.6 % were Latino/a or Hispanic; 5.1 % were African American; and 4.0 % of participants indicated another race/ethnicity or declined to provide an answer. All participants were recruited from two private colleges in the State of New York and received extra credit for completing a survey that was approved by the institutional review board at each college. In accordance with federal guidelines, the State of New York prohibits driving while intoxicated with a BAC above 0.08 %. New York State enacted legislation prohibiting the use of a hand-held cell phone while driving in 2001 and banned texting while driving in 2009. However, use of a hands-free cell phone is still permitted.

Materials

Perceived Risk Using a 5-point scale ranging from 1 (*very low risk*) to 5 (*very high risk*), participants rated the accident

risk associated with five different driving behaviors: talking on a hands-free phone, talking on a hand-held phone, reading text messages, sending text messages, and driving with a BAC just over the legal limit.

Perceived Injunctive Social Norms Participants were also presented with two 4-point scales accompanied by statements for rating the social and legal acceptability of CPWD. The first scale ranged from low (1) to high (4) social acceptance, with statements including: *People should... (1) never use cell phones while driving, (2) only use cell phones in cases of emergency, (3) only use cell phones when important, (4) use cell phones whenever they want while they're driving*. The second scale concerned laws pertaining to CPWD and ranged from most restrictive (1) to most permissive (4), with statements including: *(1) All forms of cell phone use while driving should be illegal, (2) Talking on the phone should be legal, but only when using a hands-free device, (3) Talking on a hand-held cell phone should be legal, but texting shouldn't be, (4) All forms of cell phone use while driving should be legal*. Participants identified which statement they agreed with most, as well as the statement they thought the majority of students at their college would agree with most.

Cell Phone Use While Driving Three questions were used to assess frequency of CPWD including talking on the phone and reading or sending text messages. Frequency estimates were based on a 5-point scale ranging from 0 (*never*) to 4 (*very often*). From a provided list, participants also endorsed any risk reduction strategies they employed such as avoiding cell phone use during bad weather or heavy traffic, or waiting until stopped to access their phone.

Alcohol Use and Driving Participants' alcohol use patterns were assessed with a series of questions adapted from the Daily Drinking Questionnaire (Collins et al. 1985). Using a 5-point scale ranging from 0 (*never*) to 4 (*very often*), participants also reported how often they drove after drinking enough to feel *buzzed* (i.e., "more relaxed, talkative, slight feelings of euphoria, less self-conscious, etc.") or *drunk* (i.e., "poor motor coordination, impaired judgment, slurred speech, nausea, vomiting, etc.").

Results

Perceived Risk

A repeated measures ANOVA indicated that estimates of risk differed significantly across the five categories of driving behavior, $F(4, 2868)=761.57$, $p<.001$, $\eta_p^2=0.52$. Post hoc comparisons were conducted using the Bonferroni correction. Participants believed that the safest form of CPWD was to

have a voice conversation using a hands-free device ($M=2.35$, $SD=0.94$), which they perceived as presenting a reduced accident risk compared to talking on a hand-held phone ($M=3.14$, $SD=0.96$), $p<.001$. However, participants still viewed voice conversations using a hand-held phone as presenting less risk than reading text messages while driving ($M=3.74$, $SD=0.96$), $p<.001$. Participants perceived sending text messages ($M=4.04$, $SD=0.87$) as posing a greater risk than reading text messages, $p<.001$. In fact, participants viewed sending text messages as posing a similar accident risk as driving with a BAC just over the legal limit ($M=4.03$, $SD=0.93$), $p=1.00$ (see Fig. 1).

Perceived Injunctive Social Norms

Participants thought that their peers viewed CPWD as more socially acceptable ($M=2.86$, $SD=0.78$) than they did ($M=2.42$, $SD=0.74$), $t(716)=14.63$, $p<.001$, $d=.55$. With regard to potential laws limiting CPWD, participants also perceived their peers as having more liberal and less restrictive views ($M=2.77$, $SD=0.88$) than their own ($M=2.26$, $SD=0.76$), $t(717)=14.75$, $p<.001$, $d=.55$ (see Fig. 2).

Cell Phone Use While Driving

Eighty-five percent of participants reported talking on a cell phone while driving, but only 29.8 % said they used a hands-free device the majority of the time (current state law prohibits the use of a hand-held phone). Eighty percent of participants reported reading text messages while driving compared to 68.2 % who reported sending them. A repeated measures ANOVA indicated that frequency estimates differed significantly across three types of CPWD, $F(2, 1448)=60.97$, $p<.001$, $\eta_p^2=.08$. Post hoc comparisons were conducted using the Bonferroni correction. Participants reported using their phone to read text messages while driving ($M=1.43$, $SD=$

1.02) just as often as talking on the phone while driving ($M=1.36$, $SD=0.83$), $p=.13$. However, participants reported engaging in each of these behaviors more often than sending text messages while driving ($M=1.11$, $SD=0.99$), $p<.001$ (for both comparisons). Most participants reported that they normally avoided talking on their phone (80.4 %) or texting (77.8 %) while driving in bad weather, and a majority also reported trying to avoid talking (63.3 %) or texting (69.2 %) in heavy traffic. Nearly half of participants said they would only dial their phone (45.7 %) or read a text message (49.8 %) when the vehicle was stopped, and over half (58.1 %) said they only sent text messages when stopped.

Alcohol Use and Driving

Eighty-three percent of participants reported that they currently drank alcohol and the median number of drinks per week was eight ($M=10.8$, $SD=10.4$). Just over a quarter of participants (26.6 %) reported having driven after drinking enough to feel buzzed and 7.8 % admitted to driving when they felt drunk. A repeated measures ANOVA indicated differences in the self-reported frequency of alcohol-related and cell phone-related driving behaviors among current drinkers, $F(4, 2332)=582.82$, $p<.001$, $\eta_p^2=0.50$. Post hoc comparisons were conducted using the Bonferroni correction. Current drinkers were more likely to drive while feeling buzzed ($M=0.41$, $SD=0.72$) than while feeling drunk ($M=0.12$, $SD=0.45$), $p<.001$. Similar to the full sample, current drinkers were most likely to talk on the phone while driving ($M=1.46$, $SD=0.81$) or read text messages while driving ($M=1.53$, $SD=1.00$), $p=.68$, and were more likely to do either than to send text messages while driving ($M=1.21$, $SD=0.99$), $p<.001$ (for both comparisons). However, current drinkers were still significantly more likely to send text messages while driving than to drive while feeling buzzed, $p<.001$ (see Fig. 3).

Fig. 1 Perceived risk

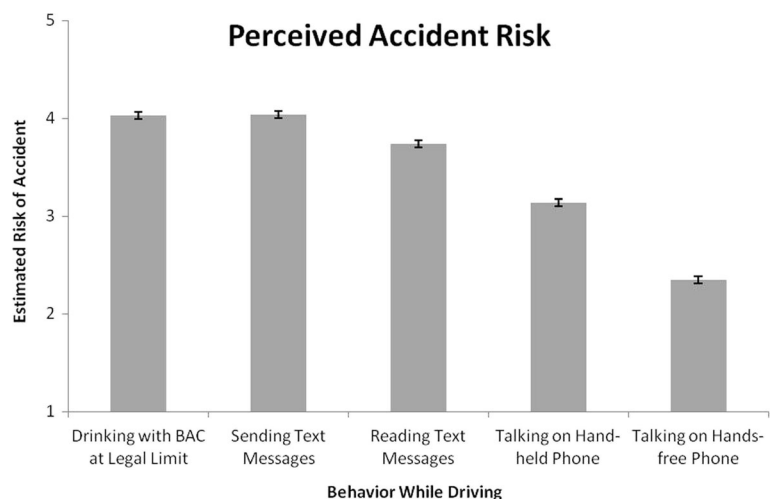
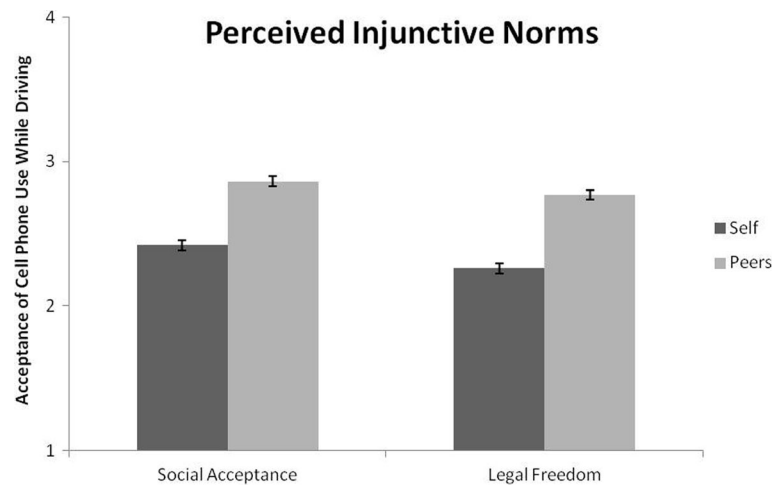


Fig. 2 Injunctive norms

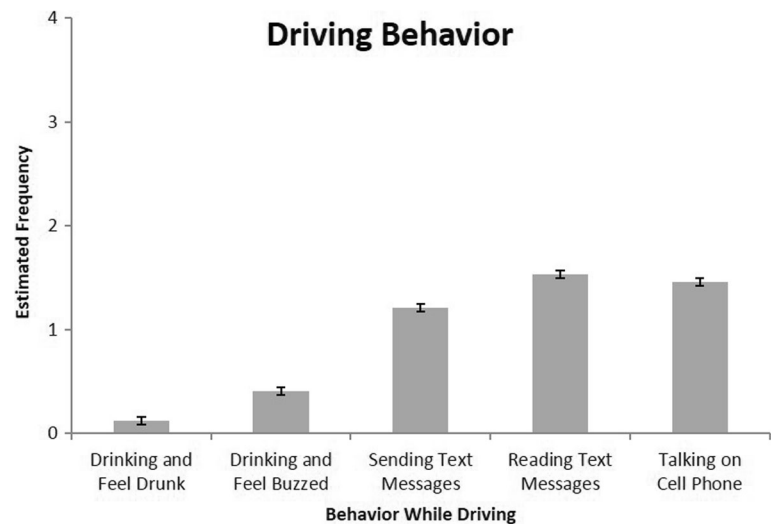
Discussion

Participants reported using their cell phone to talk and text while driving more often than driving under the influence of alcohol. This included sending text messages while driving despite rating this form of cell phone use as posing a similar accident risk as driving with a BAC just over the legal limit of 0.08 %. Participants also rated their peers as having more liberal views toward CPWD compared to their own including perceiving their peers as being less likely to endorse laws restricting individuals' freedom to engage in CPWD. Together, these findings suggest a greater normative acceptance of CPWD, both for talking and texting, compared to driving under the influence of alcohol.

The present study also suggests that college students, although willing to acknowledge significant risks associated with CPWD, may believe they capably employ risk-reduction strategies such as limiting their talking and texting behaviors to instances where driving conditions are ideal or when the vehicle is stopped. These strategies may help explain

participants' greater willingness to engage in CPWD compared to driving under the influence of alcohol, where fewer precautions are available to counteract the effects on one's driving ability. However, research has shown that drivers are often unaware of the degree to which their use of a cell phone actually affects their driving performance and young drivers in particular may be poorly calibrated to estimating the magnitude of these effects (Horrey et al. 2008). Furthermore, the effectiveness of specific risk reduction strategies and the consistency of their implementation are open questions that require further research.

Perceptions of the social acceptability of CPWD may also lead participants to view this behavior as being qualitatively different—and possibly morally distinct (Lerner 2011)—from drinking and driving, even in the face of many recent state laws banning texting while driving, hand-held cell phone use, and other distracted driving behaviors. In fact, the very recency of such laws may be a factor in limiting their perceived acceptability among the general public despite greater agreement with such laws at the individual level. For example,

Fig. 3 Driving behavior

research has shown that when presented with accident scenarios college students were reluctant to assign penalties of equal severity to distracted drivers as they did for alcohol-impaired drivers, supporting the notion that CPWD may be considered a normative behavior lacking the stigma associated with drinking and driving (Atchley et al. 2012).

Research has also shown that problematic use of one's cell phone may be a highly impulsive behavior, reinforced by various social expectations that could be seen as posing their own cost if not immediately attended (Billieux 2012). In addition, one's level of attachment to one's cell phone predicts the frequency of use while driving even after controlling for perceived risk and overall rate of use (Weller et al. 2013). Each of these factors may underlie the disconnection between the reality of younger adults' behavior despite their acknowledgement of risk. This misalignment appears most starkly with regard to texting while driving, which is more prevalent among younger drivers (Tison et al. 2011). Designing interventions that increase the perceived *severity* of distracted driving, particularly texting while driving, may be one approach to increase behavioral intentions to avoid this behavior.

Furthermore, understanding *how* CPWD affects driving performance may be an important component to educating young adults regarding the actual nature of the risks associated with various forms of CPWD. Despite some laws banning the use of a hand-held phone while driving, research has highlighted the fact that the disruption to driving performance caused by cell phone conversations largely stems from the creation of a cognitive distraction made worse by the lack of conversational modulation normally provided by an in-car passenger (Charlton 2009). In addition to cognitive distraction, texting while driving has been shown to produce both visual distraction (e.g., averting one's eyes from the road) and physical distraction (e.g., removing one's hands from the wheel; Caird et al. 2014). Educating young adults about these various forms of distraction may be important for developing appropriate and effective risk reduction strategies (Wilson et al. 2013).

Limitations

Several limitations of the present study are worth noting. First, the college sample was not uniformly representative of students of different backgrounds and levels of academic study. The sample was comprised mostly of first-year college students, attending 4-year private institutions. The sample was also disproportionately representative of Caucasian students and women. Future research should examine cell phone use while driving among a broader population of college students. Second, this research should be extended to young adults who are not enrolled in college and may spend more time commuting on a weekly basis. Their frequency of CPWD may not only be quantitatively different, but may follow a qualitatively

different pattern. In fact, although the present findings are still concerning with regard to driver safety, the results should be qualified by the fact that participants actually reported engaging in CPWD relatively infrequently (i.e., average frequency estimates for all CPWD behaviors were below the midpoint on a 5-point, Likert-type scale ranging from *never* to *very often*). Third, interpretation of the present findings is further limited by the fact that the study relied on self-report to assess the frequency with which participants engage in such behaviors as texting while driving and driving under the influence of alcohol. Direct comparison of these distinct behaviors is complicated by the lack of more precise estimates regarding their frequency. Future studies using a diary approach or ecological momentary assessment (EMA) may be able to better capture the frequency with which students engage in various distracting and dangerous driving behaviors.

Implications

Altogether, these findings support the argument that a multifaceted public health approach may better address the various factors that increase accident risk, including drunk driving and distracted driving, as well as drowsy driving, drugged driving, speeding, and road rage (Lerner 2011). Ultimately, effectively reducing distracted driving behavior related to cell phone use may require changing the public perception of such behaviors by enforcing distracted driving laws and developing social marketing campaigns that carefully incorporate information about social norms and do not focus exclusively on risk-awareness.

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