

# **Risk and regret: Identifying modifiable factors that predict drink driving and texting while driving among young adult drivers in the ACT region**

Dr Tricia Brown

Dr Amanda George

Professor Debra Rickwood

Ms Rachel Frost

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## EXECUTIVE SUMMARY

In Australia, young drivers are overrepresented in road crashes and fatalities, with the 15-24 year old age group accounting for 20% of all road deaths (AIHW, 2015). The ACT Road Strategy 2011-2020 (ACT Government, 2011) reported alcohol use and driver distraction, such as mobile phone use, as the major contributors to road accidents and fatalities. Therefore, addressing the risky driving behaviours of drink driving and driver distraction (e.g., texting while driving) among younger drivers is important.

The current research aimed to assess the extent and nature of risky driving behaviours among young people in the ACT and surrounding region, focusing on drink driving and texting while driving. The research addressed the following questions:

- 1) What is the prevalence of drink driving and text messaging while driving among young people in the ACT region?
- 2) What are the differences between key population sub-groups (e.g., male vs. female, age and licence categories) for drink driving and texting while driving behaviours?
- 3) What other types of distracted behaviour involving mobile phone use do young people engage in while driving in the ACT region?
- 4) What are young motorists' awareness levels of ACT road rules related to drink driving and texting while driving?
- 5) What factors predict future intentions to drink and drive and text while driving?

An online survey measured past behaviour, demographic variables, personality variables, attitudinal and normative variables, perceptions of risk, anticipated regret, and intentions to drink drive and text message while driving among a sample of 17 – 24 year old motorists from the ACT and region. The key findings are presented below.

### Key Findings

- The final sample comprised 612 drivers, with an average age of 20.46 years ( $SD = 2.15$ ). The sample contained approximately 70% females and 30% males. The majority (72.5%)

were studying full-time. Forty seven percent held a provisional licence, 46% a full licence and the remainder a learner licence.

- Excluding those participants who never drank alcohol, 33% of our sample reported they had driven at least once when possibly affected by alcohol in the previous 12 months. Sixty percent of drinkers indicated they had driven the morning after drinking (when unsure that the alcohol was out of their body) at least once in the past 12 months.
- Across the entire sample, 20% stated they had been a passenger with a driver they knew had been drinking too much at least once in the past 12 months.
- The perceived behaviour of peers was important in predicting drink driving behaviour, with those who thought most of their friends would drink and drive at increased odds of drink driving themselves.
- Those higher in sensation seeking and those with hazardous levels of alcohol use were at increased odds of drink driving.
- Those who perceived a greater risk of an accident associated with drink driving were less likely to engage in this behaviour. Those who anticipated that they would regret drinking and driving were also at reduced odds of doing so.
- Seventy three percent of our sample had read at least one text message while driving in the past week while 55% had sent at least one text message.
- The average number of texts sent while driving in the past week was 4.8 and the average number read was 2.9.
- Sending and reading texts while driving did not differ across age or gender.
- Past behaviour was the strongest influence of future intentions to text while driving.
- The perceived behaviour of peers was important in predicting texting while driving behaviour with those who thought most of their friends would text and drive having greater intentions of doing this in the future.
- The perceived risk of having an accident was negatively associated with intentions to both read and send texts while driving. However, the perceived risk of getting caught by the police was not a significant predictor of either behaviour.

- Those who anticipated that they would regret texting and driving were less likely to intend to text and drive. This relationship was stronger for sending versus reading texts.
- Participants reported using their hand-held mobile phones while driving in a number of other ways in addition to texting, with the most common uses being playing music (78%) and using a GPS navigation system (61%).
- Participants indicated a strong knowledge of ACT Road Rules with respect to drink driving and texting while driving, with the majority (over 90%) indicating they were aware of these rules.

The results of the current study suggest that a significant number of young drivers are engaging in texting while driving, with reading texts being more common than sending texts. Drivers in this age group are also using their hand held mobile phones in a variety of other, potentially distracting ways. Our analysis suggests that peer influences are important in determining this behaviour. In addition, making drivers aware of the risk of having a crash and of the regret they may feel if they text while driving may be relevant factors to address when seeking to reduce this behaviour.

Levels of drink driving were much less prevalent but still high, especially with respect to driving the morning after drinking. The influence of peers was again found to be important, along with perceived accident risk and anticipated regret.

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## BACKGROUND

Worldwide, around 1.24 million people die each year as a result of road traffic accidents (World Health Organisation: WHO, 2015). Young people are overrepresented in these statistics, with road traffic injuries being the leading cause of death for those aged 15 – 29 years (WHO, 2015). The 15 – 24 year old age group account for 20% of all road deaths, which are the second leading cause of death for this age group in Australia (Australian Institute of Health and Welfare: AIHW, 2015). In 2014 in the ACT, provisional licence holders represented 20% of drivers in fatal crashes and 15% of those involved in injury crashes. This is despite being only 6% of licence holders (ACT Government, 2014a). The age group involved in the largest number of crashes in the ACT in 2014 were 20-24 year olds (ACT Government, 2014).

ACT policing in the ACT Road Strategy 2011-2020 (ACT Government, 2011) noted that the main factors involved in serious road accidents and fatalities include alcohol and driver distraction, such as the use of mobile phones. These factors are likely to be especially relevant for younger drivers, as research has indicated that this age group have higher levels of dangerous drinking (Australian Bureau of Statistics; ABS, 2008) and are more likely to own mobile phones (Petroulis, 2011).

Drink driving increases the risk of a crash and the likelihood of death or a serious injury, with the risk of a crash increasing significantly above a blood alcohol concentration (BAC) of 0.04 (WHO, 2015). In Australia, Learner and Provisional licence holders legally must have a blood alcohol level of zero while full licence holders must have a level BAC of < 0.05 (ACT Road Transport Authority, 2015). However, young people aged 20 – 24 were more likely than any other age group to appear in court charged with drink or drug driving (ABS, 2008).

The distraction caused by using a mobile phone can also increase the likelihood of an accident, with drivers using a mobile phone four times more likely to be involved in a crash (WHO, 2015). In Australia, it is an offence to use a hand-held mobile phone while driving a vehicle. This includes sending or reading text messages (ACT Government, 2014b; NSW Roads and Maritime Services, 2015). A meta-analysis of the effects of texting on driving found that sending a text message while driving adversely affected almost all aspects of driving



performance and reading texts, while less severe, also had negative consequences (Caird, Johnston, Willness, Asbridge, & Steel, 2014).

Younger drivers (aged 17 – 24 years) are overrepresented in road accidents and fatalities, both in Australia and worldwide. However, the majority of road accidents, especially those caused by drink driving and by texting while driving, are potentially avoidable. Therefore, it is important to consider factors that predict the likelihood of young people engaging in these risky behaviours.

### **Factors contributing to drink driving and texting while driving**

A number of factors have been identified that may contribute to risky driving behaviours, such as drink driving and texting while driving. These include: demographic variables, such as age and gender; personality variables, such as sensation seeking and impulsivity; alcohol use and mobile phone dependence; and social-cognitive variables, such as attitudes, norms and self-efficacy.

**Age.** Younger adults are more likely to be involved in motor vehicle accidents and fatalities, and are more likely to engage in risky driving behaviours. A recent study by Sarma, Carey, Kervick and Bimpeh (2013), using a national survey of drivers in the republic of Ireland ( $N = 1638$ ), found that those under 25 years of age engaged in more risky driving behaviours, including drink driving, compared to those over 25 years of age. A longitudinal study (Vassallo et al., 2014) examined the stability of risky driving behaviours among young Australian drivers from late adolescence (19-20 years) to early adulthood (23-24 years) and found that while some risky behaviours decreased over this period (e.g., speeding), other risky behaviours increased. Notably, drink driving increased significantly rising from 13.4% to 22.5%; however, note that licence restrictions regarding alcohol use are tighter for the younger age group on provisional licences.

There is evidence that younger adults engage in texting and driving and are more likely to use a mobile phone when driving compared to older drivers (McEvoy et al., 2006). Wadell and Wiener (2014) found that age was negatively related to intentions to use mobile phones while driving, including sending and receiving text messages. Likewise, Walsh, White, Hyde and

Watson (2008) found that age was a significant negative predictor of intentions to text while driving. Less is known about differences in texting behaviours within the 17-24 year old age cohort, with some studies using younger people not reporting effects for age.

**Gender.** Gender has been implicated in risky driving behaviour, with males generally engaging in greater levels of risky behaviours than females (Sarma et al., 2013). Young males are more likely to drink at dangerous levels compared to females, are more likely to engage in drink driving (ABS, 2008) and are more likely to be involved in road fatalities (Bureau of Infrastructure, Transport and Regional Economics: BITRE, 2013).

A number of Australian studies have found no gender differences in mobile phone use while driving or texting while driving (Nemme & White, 2010; Wadell & Wiener, 2014) with others finding males more likely to use their phone while driving (Walsh et al., 2008). Struckman-Johnson and colleagues (2015) in a sample of US college students found no difference between the levels of texting while driving between males and females. However, they did find different predictors across gender groups, with males' texting behaviour predicted by risk assessment (how distracted they perceived themselves to be while texting) and mobile phone dependence, and females texting predicted by mobile phone dependence and risk aversion.

**Personality.** Personality variables relevant to drink driving and texting while driving include impulsivity and sensation seeking (Sarma et al., 2014). Higher levels of trait impulsivity have been associated with drink driving (Ryb, Dischinger, Kufera, & Read 2006) and sensation seeking (the tendency to seek novel, varied, and thrilling sensations and experiences) has been found to predict driving while intoxicated (Zakletskaia, Mundt, Balousek, Wilson, & Fleming, 2009). Hatfield, Fernades and Job (2014) found that sensation seeking moderated the relationship between perceived risk and drink driving. Perceived risk acted as a deterrent to drink driving for low sensation seekers but not high sensation seekers. However, Sarma et al. (2014) found that personality variables were not significant predictors of drink driving (although impulsivity predicted reckless driving).

Limited research has been performed on the role of personality variables in texting while driving. However, impulsivity has been linked to dependence on, and use of, mobile phones, and to problematic mobile phone use (Billieux, van der Linden, D'Acromont, Ceschi, & Zermatten, 2007).

**Hazardous alcohol use.** There is plentiful evidence that the level of alcohol consumption and risky alcohol consumption are positively associated with the incidence of drink driving (e.g., Bingham, Elliott, & Shope, 2007; McDonald, Sommers, & Fargo, 2014). Given that alcohol use and drink driving often share common factors, it is important to take into account alcohol usage when examining predictors of drink driving.

**Mobile phone dependence.** Level of attachment or dependency on cell phones has been linked to greater likelihood of texting while driving (Gauld, Lewis, & White, 2014; Weller, Shackelford, Dieckmann, & Slovic, 2013). Struckman-Johnson et al. (2015) found mobile phone dependence to be a significant predictor of texting while driving while impulsivity was not a significant predictor. This variable warrants further investigation in studies examining the texting behaviour of young people.

### **Theory of Planned Behaviour**

The influence of psychosocial cognitions, such as attitudes, norms and self-efficacy, on risky driving behaviours have been largely examined within the context of the Theory of Planned Behaviour (TPB: Ajzen, 1991). This model proposes that behavioural intentions are predicted by attitudes (how one feels about performing a behaviour or one's evaluation of a behaviour), subjective norms (how one thinks significant others would feel about one performing a behaviour), and perceived behavioural control or self-efficacy (PBC: one's perception of how much control one has over performing a behaviour or how difficult a behaviour is to perform).

The efficacy of the TPB in explaining behaviours across a wide range of domains has been well established (Armitage & Conner, 2001). The model has been widely applied within the road safety domain and in the analysis of risky driving behaviours, including: speeding (Horvath, Lewis, & Watson, 2012; Elliot & Thomson, 2010), traffic violations (Parker, Manstead,

Stradling, & Reason, 1992), and unsafe motor cycle riding (Tunnicliff et al., 2012). The model has also been applied to drink driving behaviour, and to use a mobile phone (including texting) while driving.

**Drink driving.** While the TPB has been successfully applied to understanding drink-driving intentions and behaviours, findings have been somewhat mixed regarding which variables are the most important predictors. Parker, Manstead, Stradling, Reason and Baxter (1992) found the TPB constructs of attitudes, norms and PBC all significantly predicted intentions to drink and drive and together explained around 42% of the variance in drink-driving intentions, with PBC being the strongest predictor. Ravis, Abraham and Snook (2011) also found that attitudes, subjective norms and PBC all significantly predicted willingness to drink and drive among a sample of young men, again finding that PBC was the strongest predictor. Armitage, Norman and Conner (2002) found support for the TPB variables significantly predicting intentions to drink and drive in an undergraduate sample, together explaining 47% of the variance, while Marcil, Bergeron, and Audet (2001) in a sample of younger male drivers (18 – 24 year) found attitudes were the strongest predictor of intentions. However, Sarma et al. (2014), using a model including TPB variables in addition to demographic and personality variables to predict driving behaviours, found attitudes to be the only significant TPB predictor, with their overall model explaining 22% of the variance in self-reported drink driving behaviour.

Studies using the TPB often find subjective norms to be the weakest predictor of behavioural intentions (Armitage & Conner, 2001) and because of this a number of studies have sought to extend the TPB with additional measures of normative influences. Normative influences may be especially important in determining the behaviours of young people who are often highly influenced by their peers (Walsh, White & Young, 2010). Moan and Rise (2011) examined the influence of moral norm and descriptive norm in addition to the traditional TPB variables in their examination of intentions *not* to drink and drive. Descriptive norms describe what is perceived to be common behaviour whereas moral norms relate to what is perceived to be right or wrong (Moan & Rise, 2011). Moan and Rise (2011) found across their entire sample TPB variables only accounted for 10% of the variance in intentions not to drink and drive, with

PBC being the strongest predictor, followed by attitudes with subjective norm being non-significant. The addition of descriptive and moral norms added a small but significant amount of variance.

**Texting while driving.** A limited number of studies have applied the TPB to understanding texting while driving. Walsh and colleagues (2008) found the TPB variables explained 11-13% of intentions to text message while driving among a convenience sample of 801 commuters recruited from petrol stations in the Brisbane region. Attitude was the strongest predictor. Wadell and Wiener (2014) found all three TPB variables predicted intentions to engage in both initiating behaviours (make a call or send a text) and responding behaviours (receive a call or read a text) while driving, accounting for around 47% of both types of intentions (PBC was the strongest predictor). They argue when examining predictors of texting while driving it is important to distinguish between initiating and responding behaviours which may have different psychosocial influences. Wadell and Wiener also examined the additional influence of descriptive norms, finding that this variable made a small but significant additional contribution. Nemme and White (2010) used the TPB to examine young drivers' (17 – 24 years old) intentions to text while driving in a sample of university students. They measured the traditional TPB variables of attitudes, subjective norms and PBC, plus additional variables of group norms (what you think members of your reference groups would do) and moral norms. Results supported use of TPB which accounted for 28-29% of variance in intentions to both send and read texts while driving, with attitude emerging as the strongest predictor. The addition of the social influence variables (norms) significantly improved explanation.

Gauld et al. (2014) examined predictors of concealed texting intentions in a sample of young (17 - 25 years) university students. Concealed texting refers to conscious efforts to hide texting while driving. Gauld and colleagues measured the TPB variables, as well as moral norm, anticipated regret (reviewed below) and mobile phone involvement (dependence). This last variable assesses participants' cognitive and behavioural associations with their mobile phone and is related to addictive tendencies (Walsh et al., 2010). The TPB variables explained 69% of the variance in intentions to engage in concealed texting while driving, with attitudes and PBC

being the strongest predictors. In addition, moral norm and mobile phone involvement added significantly (6% of variance) to the TPB variables in explaining intentions.

### **Additional, Modifiable Variables**

The above review suggests the TPB can successfully predict intentions and behaviours with respect to drink driving and texting while driving. However, while the amount of variance explained by the TPB models varies, much unexplained variance remains (Koch, 2014; Sandberg & Conner, 2008). While the TPB has great utility in predicting health related behaviours that involve premeditation, it may be less successful in predicting risky behaviours that tend to be more spontaneous (Sarma et al., 2014). In addition, TPB variables, such as attitudes and PBC, can be difficult to change and may not be ideal targets for road safety campaigns (Koch, 2014), highlighting the need to examine additional, potentially modifiable variables relevant to the prediction of risky driving intentions and behaviours. We now examine two such variables: anticipated regret and perceived risk.

**Anticipated Regret.** Regret is a negative cognitive emotion experienced when we realise our current situation could have been better if we had acted differently (Sandberg & Conner, 2008). For example, if we are involved in a road accident while driving under the influence of alcohol, we would likely regret the decision to drink and drive. *Anticipated regret* (AR) is a prospective, aversive, cognitive emotion (Koch, 2014). It involves thinking about how we will feel in the future if certain events occur. For example, prior to making the decision to drink and drive, we might think about how we would feel if we drove intoxicated and caused a serious accident.

Sandberg and Conner (2008) performed a meta-analysis examining the additional effects of AR to the prediction of behavioural intentions above the effects of the standard TPB variables in a variety of health and safety domains. They found that there was a strong relationship between AR and behavioural intentions over and above the effects of the TPB variables. With respect to road safety, most research to date using AR has looked at speeding behaviour, with a negative relationship found between AR and speeding intentions among motorcyclists, after controlling for TPB variables (Chorlton, Conner, & Jamson, 2012; Elliott &

Thomson, 2010; Elliot, Thomson, Robertson, Stephenson & Wicks, 2013). Koch (2014) notes that while AR has been established as a predictor of speeding, there has not been sufficient research examining the role of AR in predicting other risky driving behaviours, specifically drink driving and use of mobile phones when driving.

There are no known studies examining AR in the context of drink driving. However, AR has been found to predict binge-drinking intentions in an undergraduate sample, after taking into account the influence of TPB variables (Cooke, Sniehotta & Schuz, 2006). Hamilton and Schmidt (2014) found AR was a significant negative predictor of young Australian males' intentions to swim while intoxicated. Haque et al. (2012) found AR added to the prediction of intentions to walk while intoxicated in a sample of young Australian undergraduates (18 – 25 years) beyond the influence of TPB variables. Given these findings, it seems feasible that AR may also contribute to decisions to drink and drive.

We identified only one study that examined the role of AR on texting behaviours (Gauld et al., 2014). This study found no significant effect for AR in the prediction of intentions to engage in concealed texting while driving or subsequent concealed texting behaviour. However, the study only reported a specific category of texting intentions and behaviour, namely concealed texting, which may not generalise to other types of texting behaviour.

It has been suggested that there may be conceptual overlap between the variables of moral norms and anticipated regret (Newton, Newton, Ewing, Burney, & Hay, 2013). As outlined above, previous studies have found effects for moral norm on drink driving and texting while driving, suggesting possible effects for AR (Gauld et al., 2014; Moan & Rise, 2011).

**Perceived risk.** Perceived risk is our assessment of how vulnerable we are to the risks associated with a given behaviour (Pearson & Hamilton, 2014). Bingham, Elliott and Shope (2007) found that lower perceived risk of drink driving (including risk of having an accident and risk of getting caught by police) predicted greater drink driving, once level of alcohol use had been adjusted for. Hatfield and colleagues (2014) found that perceived risk predicted drink driving for those low on sensation seeking. With respect to texting while driving, Walsh et al. (2008) measured two types of perceived risk: risk of apprehension (by the police) and risk of

crashing. They found perceived risk of apprehension was a significant predictor of intentions to text while driving while perceived risk of having a crash was not. Nelson, Atchley and Little (2009) found perceived risk was a significant negative predictor of intentions to both send and receive texts while driving.

### **Overview of Current Study**

A number of factors are likely to contribute to drink driving and texting while driving among young adults. While the TPB has been successful in explaining a wide range of health related behaviours, it has some limitations in its application to risky decision making, assuming rational cognitive decision making processes which may not apply to decisions that are not premeditated, like decisions to drink and drive or to text while driving. Anticipated regret has been shown to successfully predict intentions to perform a range of risk-related behaviours (e.g., speeding), and there is support for augmenting TPB models with AR (Koch, 2014). However, this variable needs further investigation in the areas of drink driving and texting while driving. Likewise, there is evidence that perceived risk may be an important influence on the decision to drink and drive or text while driving. Importantly, both anticipated regret and perceived risk may be more readily modifiable than TPB variables and other relevant factors such as demographics and personality. Therefore, if these variables are shown to be predictors of intentions to drive and drive, and text while driving, they may be useful factors to target in education programs and interventions designed promote safer driving behaviours

### **Aims of the current study**

The current study has the following aims:

1. To identify the prevalence of drink driving and mobile phone use while driving among a sample of young adults (17 – 24 years) within the ACT region, in addition to assessing awareness of road rules regarding mobile phone use and drink driving among this age group.
2. To examine the predictors of intentions to drink drive and to text (reading and sending SMS) while driving among this sample. The research will focus on the efficacy of anticipated regret and perceived risk as additional predictors in a model that includes the TPB variables



(attitudes, norms, perceived behavioural control). The model tested will also control for variables found to be relevant to the explanation of risky driving behaviours, including demographic variables (age, gender, licence category), personality and past behaviour. For drink driving, hazardous alcohol use will be considered as an additional background variable whereas for texting while driving mobile phone dependence will be included.

## METHOD

### Participants

Data was available for a total of 612 participants aged between 17 and 24 years ( $M_{age} = 20.46$ ,  $SD_{age} = 2.15$ ) from the ACT and surrounding region who responded to an online survey. All participants drove a car and used a mobile phone. The sample was comprised of approximately 70% females and 30% males. Additional participant characteristics, and comparison with ACT population statistics, are provided in Table 1. There was a higher representation of females in the current study compared to the general ACT population. The study sample also comprised a larger proportion of university students, particularly those studying full-time. Please note that missing data was identified across most variables. As such, different participant numbers are reported for each analysis based on the data available.

**Table 1.** Participant Characteristics of Study Sample and Comparison with the ACT Population (ABS, 2011 Census data)

Characteristic	Study sample	ACT population
	% (N)	% (N)
<b>Studying</b>		
Full-time	72.5 (444)	45.38 (20,899)
Part-time	11.4 (70)	9.47 (4,359)
Not studying	16 (98)	39.11 (18,009)
Unknown	-	6.04 (2,783)
<b>Educational institution</b>		
University	71.2 (436)	55.76 (15,635)
School	7.8 (48)	17.31 (4,854)
TAFE	4.9 (30)	13.44 (3,768)
Unknown	-	13.50 (3,785)
<b>Employment</b>		
Full-time	19.4 (119)	34.20 (15,751)
Part-time	18.8 (115)	28.92 (13,317)
Casual	44.3 (271)	-
Unemployed	13.6 (83)	5.90 (2,718)
Other	3.9 (24)	25.52 (11,750)
<b>Licence type</b>		
Full	45.9 (281)	-
Provisional	47.1 (288)	-
Learner	6.9 (42)	-
Suspended	0.2 (1)	-
<b>Driving history</b>		
Less than 1 year	12.7 (78)	-
1-2 years	27.9 (171)	-
3-5 years	39.2 (240)	-
5+ years	20.1 (123)	-

## Procedure

Prior to commencement of the study, ethics approval was obtained from the University of Canberra Human Research Ethics Committee (Approval No: HREC 15-259). Purposive sampling was used to recruit eligible participants to an online survey. Inclusion criteria required participants to be aged between 17-24 years, drive a motor vehicle, use a mobile phone, and live in the ACT or surrounding region. The recruitment strategy was two-fold: distribution of advertising flyers and Facebook advertising. Flyers were posted around the concourse, central buildings, and carparks of the major educational institutions in the ACT (Australian National University, Australian Catholic University, University of Canberra, Australian Defence Force Academy, and Canberra Institute of Technology). Flyers were distributed between 20 March and 14 April, 2016. Facebook advertising was employed to increase the representativeness of the sample as it allows advertisers to specify a target market (e.g., by age, 17 – 24 years, and location, ACT and region). Facebook advertising ran for one month, from 1 April to 30 April, 2016. The survey was closed to participants at the end of April.

Participants accessed the survey via a link provided in the advertising material. Participants completed a series of self-report measures (outlined below) at their own pace and were free to discontinue the survey at any point. On completion of the survey, participants were provided with the contact details for counselling and youth support services, and with details of the Australian Federal Police website to access information regarding the rules regarding mobile phone use while driving and drink driving. The first 400 participants were offered a \$10 Coles/Myer gift card and remaining participants were entered into a \$100 Coles/Myer gift card draw.

## Measures

The self-report survey measured past prevalence of drink driving and texting while driving behaviours, future intentions to engage in drink driving and texting while driving, demographic variables, theory of planned behaviour variables (attitudes, norms, perceived behavioural control), the potentially modifiable additional variables of anticipated regret and

perceived risk, and personality and other background variables. In addition there were questions regarding other hand-held mobile phone use while driving (besides texting) and questions regarding the awareness of ACT Road Rules concerning drink driving and texting while driving. Details of all items used in the survey are available from the authors on request.

### **Past Behaviour and Future Intentions**

With respect to drink driving, past behaviour was measured in the context of the previous 12 months, consistent with previous research. Participants were asked to indicate how often they had engaged in each of the following behaviours: driven when possibly affected by alcohol, driven the morning after drinking when possibly still affected, and been a passenger with a driver who has been drinking too much alcohol. Responses were made on a 7-point scale from 1 (*never*) to 7 (*very often*).

For texting while driving, past behaviour was measured in the context of the previous week as these behaviour are more common than drink driving. Participants were asked to estimate how many times they had read a text message and sent a message respectively while driving in the past week.

Future intentions regarding drink driving were measured by asking participants to indicate how likely (1 = *very unlikely*, to 7 = *very likely*) it is that they will drink and drive in the next 12 months. For texting and driving, participants indicated the likelihood of reading a text message while driving and sending a text message while driving in the next week (1 = *very unlikely*, to 7 = *very likely*).

### **Other mobile phone activities while driving**

Participants were provided with a list of mobile phone activities and asked to indicate each activity they had engaged in while driving in the past week. Activities included: making phone calls (touching hand-held phone), answering phone calls (touching hand-held phone), social media use (e.g., Facebook, Twitter, Instagram), GPS navigation (touching hand-held phone), playing music, taking photos/videos, browsing the Internet, playing games, online shopping, or watching movies/YouTube. Participants were able to tick as many as applicable.

## Demographics

Participants' age, gender, educational status and institution, employment status, licence type, and driving history were obtained.

## Theory of Planned Behaviour (TPB) variables

The TPB variables of attitude, subjective norm, descriptive norm and perceived behavioural control were all adapted from measures used by Walsh et al. (2008) and Wadell and Wiener (2014). All responses were on a 7-point scale from 1 (*strongly disagree*) to 7 (*strongly agree*). Each variable was measured with respect to drink driving, and both reading and sending text messages while driving. The drink driving items were framed within the context of the next 12 months whereas the texting while driving items were framed within the context of the next week. *Attitude* was assessed via the item: "Drinking and driving [reading/sending a text message while driving] in the next 12 months [week] would be good". Normative influences were measured in response to the items "Those people who are important to me would want me to drink and drive [read/send text messages while driving] in the next 12 months [week]" (*subjective norm*) and "Most of my friends would drink and drive [read/send a text message while driving] in the next 12 months [week]" (*descriptive norm*). Participants' perception of control over whether they would read or send a text message (*perceived behavioural control*) was measured in response to the statement: "I have complete control over whether I will drink and drive [read/send text messages while driving] in the next 12 months [week]".

## Additional/Modifiable Variables

**Perceived Risk.** Perception of risk was measured by two items, adapted from Walsh et al. (2008), which asked participants the extent which they agree it is likely that they will either "have an accident" or "get pulled over by the police" if they drank and drove or sent/read a text message while driving. Once again, the drink driving questions were presented in the context of the next 12 months and the texting while driving items in the context of the next week. Participants indicates their agreement with items on a scale from 1 (*strongly disagree*) to 7 (*strongly agree*).

**Anticipated Regret.** Anticipated regret was measured by one item adapted from Abraham and Sheeran (2004) and was asked with respect to drink driving, sending texts while driving and reading texts while driving. (e.g., “If I read a text message while driving in the next week I would feel regret”). Ratings were made on a 7-point scale from 1 (*strongly disagree*) to 7 (*strongly agree*).

### **Other Variables**

We identified other important factors that needed to be considered in the prediction of drink driving and/or texting while driving. These included hazardous alcohol use, mobile phone dependence and personality factors which are further described below.

**Alcohol Use.** The 10-item Alcohol Use Disorders Identification Test (AUDIT; Saunders, Aasland, Babor, de la Fuente, & Grant, 1993) was completed. The total AUDIT score is a summation of three subscales (quantity/frequency of alcohol consumption, alcohol-related harm, and alcohol dependence), with a possible range of 0-40. A cut-off score of eight or more indicates hazardous/harmful alcohol use (Babor, Higgins-Biddle, Saunders, & Monteiro, 2001).

**Mobile Phone Dependence.** The 8-item Mobile Phone Involvement Questionnaire (Walsh et al., 2010) was used to measure participants’ cognitive and behavioural dependence on their mobile phone (e.g., “I often think about my mobile phone when I am not using it” and “I lose track of how much I am using my mobile phone”). Ratings were made on a 7-point scale from 1 (*strongly disagree*) to 7 (*strongly agree*), with higher means indicating greater mobile phone involvement. This scale has previously been found to have good internal consistency (Cronbach’s  $\alpha = .78$ , Walsh et al., 2010).

**Impulsivity.** Impulsivity was measured by the Barratt Impulsiveness Scale—Brief (Steinberg, Sharp, Standord & Tharp, 2013). This is comprised of eight items scored on a 4-point scale with higher scores indicative of higher levels of general impulsiveness.

**Sensation seeking.** Sensation seeking was measured by a subset of six items from the Sensation Seeking Scale (Zuckerman et al., 1978). Ratings were made on a True/False response and summed to calculate a total score ranging from 0-6 (higher scores indicate higher levels of

sensation seeking). This subset of six items has been used previously to assess sensation seeking (Steinberg et al., 2008).

### **Awareness of ACT Road Rules.**

Participants responded to five items to indicate their awareness (Yes/No) of the ACT Road Rules regarding drink driving and mobile phone use while driving.

## **Statistical analyses**

IBM SPSS 22.0 statistical package was used for data analysis. Descriptive statistics are reported for the prevalence of past drink driving and texting while driving behaviours. Independent samples *t*-tests assessed differences in past behaviour across demographic categories. Descriptive statistics are also provided for other types of mobile phone related activities while driving and knowledge of the ACT road rules.

Hierarchical logistic regression/multiple regression analyses were conducted to examine predictors of past drink driving behaviour and of intentions to read/send text messages while driving in the next week. Demographic variables and past behaviour were entered at step 1 to control for their effect. Personality and other background variables were entered at step 2, followed by the TPB variables at step 3 (attitudes, subjective norm, descriptive norm, perceived behavioural control), and perceived risk (accident and police) and anticipated regret were entered at the final step to assess their additional contribution beyond TPB variables.

## RESULTS

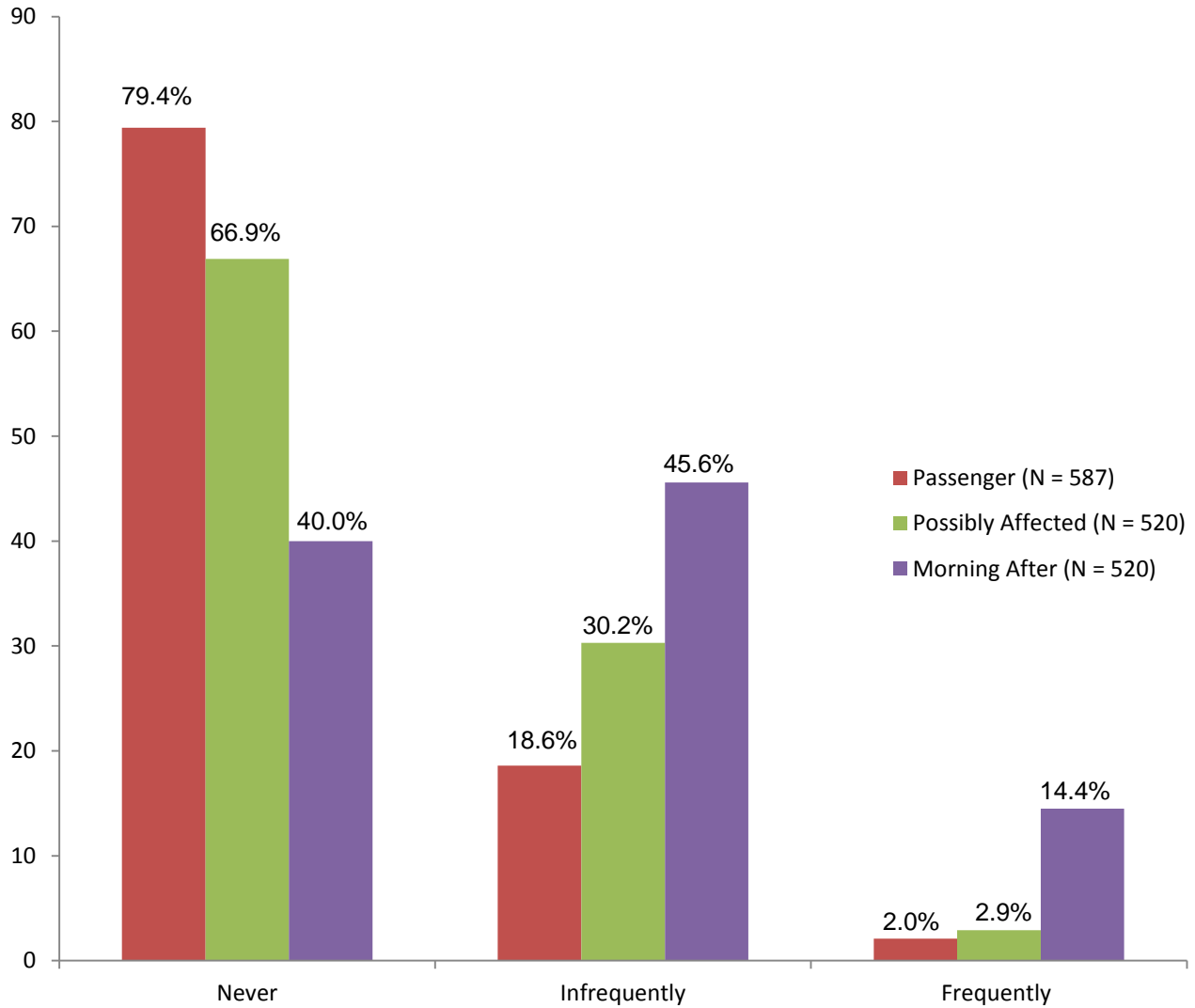
### Self-Reported Drink Driving Behaviours

Excluding the 68 participants who reported 'never' drinking alcohol, a total of 33.1% had driven in the preceding 12 months when 'possibly affected by alcohol' ( $n = 172$ ) with 2.9% ( $n = 15$ ) reporting they did so frequently (see Figure 1). Males and full licence drivers had higher mean scores for frequency of this behaviour (see Table 2).

More drinkers reported having driven the morning after drinking (uncertain that alcohol was out of their body) in the preceding 12 months with 60% ( $n = 312$ ) reporting doing so at least once and 14.4% ( $n = 74$ ) reporting doing so frequently (see Figure 1). There were no significant differences by age, sex or licence category (see Table 2).

All participants were asked if they had been a passenger with a driver who they knew had been drinking too much alcohol in the preceding 12 months. A total of 20.6% ( $n = 121$ ) stated they had done this at least once, with 2% ( $n = 12$ ) reported that they had done this frequently (see Figure 1). There were no significant differences across age, gender or licence category (see Table 2).





**Figure 1.** Percentage of participants engaging in drink driving behaviours.

*Note.* Categorised as never = 1, infrequently = 2-4, and frequently = 5-7. Passenger = been a passenger with a driver who you know has been drinking too much alcohol, Possibly Affected = driving when possibly affected by alcohol, Morning After = driven the morning after drinking, uncertain that alcohol is out of the body.

**Table 2.** Mean Drink Driving Related Behaviours<sup>a</sup> in the Past 12 Months by Demographics

	Passenger			Possibly Affected			Morning After		
	N	Mean	SD	N	Mean	SD	N	Mean	SD
<b>Age</b>									
17-20	298	1.33	0.81	261	1.51	1.03	261	2.56	1.74
21-24	284	1.40	0.93	254	1.65	1.11	254	2.33	1.66
<b>Gender</b>									
Male	176	1.45	0.90	157	1.77**	1.33	157	2.60	1.78
Female	410	1.32	0.85	362	1.49	0.93	362	2.40	1.66
<b>Licence category</b>									
L/P plate	319	1.34	0.88	274	1.40***	0.90	274	2.42	1.67
Full	267	1.37	0.85	246	1.77	1.22	246	2.50	1.73

<sup>a</sup>With the exception of being a passenger in a car with a driver likely affected by alcohol, all other analyses are conducted among drinkers only. Passenger = been a passenger with a driver who you know has been drinking too much alcohol, Possibly Affected = driving when possibly affected by alcohol, Morning After = driven the morning after drinking, uncertain that alcohol is out of the body.

\*  $p < .05$ , \*\*  $p < .01$ , \*\*\*  $p < .001$ .

## Predictors of Drink Driving

We conducted a logistic regression analysis which assessed the relative importance of the predictor variables on drink driving (defined as 'having driven when possibly affected by alcohol in the past year' [yes/no]). We did not use intentions to drink and drive as the outcome variable as responses on that measure were extremely skewed and, given the likelihood that few plan to drink and drive and rather engage in it as a spontaneous act, we proceeded with a measure of actual past drink driving behaviour.

Age, gender, licence type and hazardous alcohol use (yes/no) were added at step 1 (and explained 10% of the variance in drink driving, Nagelkerke  $R^2 = .10$ ,  $p < .001$ ). The addition of personality variables (impulsivity and sensation seeking) at step 2 made a significant contribution to the model ( $p < .001$ ), with total variance explained increasing to 16%. Step 3 included the TPB variables (attitude, descriptive norm, subjective norm, perceived behavioural control) and made a further significant contribution ( $p < .001$ ), increasing total variance explained to 26%. Finally, as per the aims of the study, we added the modifiable variables (perceived accident risk, perceived police risk, anticipated regret) to the model to determine if they made a significant additional contribution to the prediction of drink driving. At this final step, the modifiable factors *did* make a further significant contribution to the model ( $p = .02$ ) and the full model explained 28% of the variance (Nagelkerke  $R^2 = .28$ ) and correctly classified 72% of cases.

Table 3 below shows the variables which were significant predictors in the final model. Results demonstrate that the odds of drink driving were higher for those with a full licence (relative to Provisional/Learner) and for those consuming alcohol at hazardous/harmful levels. Of the psychosocial predictors, those who believed their friends were drink driving (descriptive norm) or were higher on sensation seeking had greater odds of drink driving. Other significant predictors were perceived accident risk and anticipated regret (higher perceived risk of having an accident and higher anticipated regret were associated with reduced odds of drink driving).

**Table 3.** Odds Ratios for Significant Predictors of Drink Driving in Final Regression Model

Significant Predictors	Odds Ratio
Descriptive norm	1.51***
Licence category (Full licence)	3.11**
Sensation seeking	1.23**
AUDIT (hazardous alcohol use)	1.96**
Perceived risk (accident)	0.84*
Anticipated regret	0.85*

*Note.* Age, impulsivity, attitude, perceived behavioural control, subjective norm and perceived risk (from police) were all non-significant in the final model.

\*  $p < .05$ , \*\*  $p < .01$ , \*\*\*  $p < .001$

## Self-Reported Texting while Driving Behaviours

Participants were asked to estimate the number of text messages they had read or sent while driving in the past week. Overall, 73.5% of the sample had read at least one text message during the preceding week and 55.2% had sent at least one text message. The average number of texts read per week was 4.84 ( $SD = 8.82$ , range = 0-100,) while the average number of texts sent per week was 2.91 ( $SD = 6.10$ , range = 0-50). Participants reported reading significantly more texts than they sent,  $p < .001$ . Of those participants who had read or sent at least one text message, the average rose to 6.75 read ( $N = 418$ ) and 5.26 sent ( $N = 314$ ), respectively. The mean numbers of texts read and sent while driving by age, gender, and licence type are shown in Table 4. There were no significant differences for reading and sending text messages across age category, gender, or licence type.

**Table 4.** Mean Number of Texts Read/Sent in Past Week by Demographics

	Reading			Sending		
	N	Mean	SD	N	Mean	SD
<b>Age</b>						
17-20	294	4.63	9.33	285	2.75	6.07
21-24	282	5.01	8.25	280	3.07	6.18
<b>Gender</b>						
Male	177	4.92	8.88	171	2.87	6.93
Female	405	4.82	8.81	397	2.93	5.73
<b>Licence Type</b>						
L/P plate	315	4.42	9.02	303	2.59	5.97
Full licence	270	5.35	8.58	265	3.27	6.26

Note. L/P plate = Learner and Provisional licence drivers

## Predictors of Intentions to Text while Driving

Intentions to read a text message while driving in the next week ( $M = 3.35, SD = 2.08$ ) were significantly greater than intentions to send a text message ( $M = 2.71, SD = 1.95$ ),  $p < .001$ . Hierarchical regression analyses were performed to examine the impact of theory of planned behaviour (TPB) variables and the additional influence of perceived risk and anticipated regret on intentions to read and send text messages while driving in the next week, while controlling for the effects of demographic and personality variables, mobile phone dependence, and past behaviour.

### Predictors of Intentions to Read Text Messages While Driving

Gender, age, licence type and past behaviour were entered at Step 1, significantly explaining 37% of the variance in intentions,  $p < .001$ . The addition of personality variables (impulsivity and sensation seeking) and mobile phone dependence at Step 2 significantly explained a further 4.3% of the variance in intentions,  $p < .001$ . On step 3, the TPB variables (attitude, descriptive norm, subjective norm, perceived behavioural control) were added to the

model and significantly explained an additional 8.7% of the variance in intentions,  $p < .001$ . The modifiable variables (perceived accident risk, perceived police risk, anticipated regret) were included at step 4 and contributed an additional significant 5% of the variance,  $p < .001$ , with the final model including all predictors explaining 55% of the variance in intentions,  $p < .001$ .

**Table 5.** Standardised Regression Coefficients for Significant Predictors of Intentions to Read Texts While Driving in Final Regression Model

Significant Predictors in Order of Significance	Beta
Past Behaviour	.427***
Perceived Risk (accident)	-.239***
Descriptive Norm	.237***
Attitude	.129***
Licence Type (full)	.104*
Mobile Phone Dependence	.096**
Perceived Behavioural Control	.076*
Anticipated Regret	-.064*

*Note.* Age, gender, impulsivity, sensation seeking, subjective norm and perceived risk (police) were all non-significant in the final model.

\*  $p < .05$ , \*\*  $p < .01$ , \*\*\*  $p < .001$

Table 5 presents the significant predictors in the final model in order of importance. Not surprisingly, the strongest predictor was past behaviour, with those reporting performing this behaviour in the past week having higher intentions of reading texts while driving in the next week. Normative influences were also important, with descriptive norms being the next strongest predictor. Specifically, those who agreed that most of their friends would read texts while driving had stronger intentions of doing this themselves. The next strongest predictors were the perceived risk of having an accident, which was negatively related to intentions to read texts while driving, and a positive attitude to reading texts while driving which predicted greater intentions. Mobile phone dependence, perceived behavioural control and anticipated regret all had small but significant effects on intentions to read texts while driving. Greater mobile phone dependence and great perceived behavioural control were associated with

greater intentions, whereas anticipated regret had a negative relationship with intentions. The only demographic variable with a significant influence in the final model was licence type, with full licence drivers having higher intentions to read texts while driving than provisional/learner drivers.

**Predictors of Intentions to Send Text Messages While Driving**

Gender, age, licence type, and past behaviour were entered at Step 1, significantly explaining 39.6% of the variance in intentions,  $p < .001$ . The addition of personality variables (impulsivity and sensation seeking) and mobile phone dependence at step 2 significantly explained an additional 5.5% of the variance in intentions,  $p < .001$ . On step 3, the TPB variables (attitude, descriptive norm, subjective norm, perceived behavioural control) were added to the model and significantly explained a further 7.7% of the variance in intentions,  $p < .001$ . The modifiable variables (perceived accident risk, perceived police risk, anticipated regret) were included in step 4 and contributed an additional significant 6.3% of the variance in intentions,  $p < .001$ . The final model with all predictors included explained 59.1% of the variance in intentions to send texts while driving,  $p < .001$ .

**Table 6.** Standardised Regression Coefficients for Significant Predictors of Intentions to Send Texts While Driving in Final Regression Model

Significant Predictors in Order of Significance	Beta
Past Behaviour	.450***
Anticipated Regret	-.197***
Descriptive Norm	.170***
Perceived Risk (accident)	-.145***
Mobile Phone Involvement	.145***
Attitude	.134***

*Note.* Age, gender, licence type, impulsivity, sensation seeking, subjective norm, perceived behavioural control and perceived risk (police) were all non-significant in the final model.  
 \*\*\*  $p < .001$

Table 6 presents the significant predictors in the final model in order of importance. Again, past behaviour was the strongest predictor of future intentions. Anticipated regret was

the next strongest predictor, with higher levels of anticipated regret associated with lower intentions to send texts while driving. Descriptive norms, perceived accident risk, mobile phone dependence and positive attitude were respectively the next strongest predictors. Descriptive norms, mobile phone dependence and attitude were all positive predictors of intentions whereas perceived accident risk was a negative predictor.

In summary, both models were able to explain a large proportion of the variance in intentions to read and send texts while driving. For both types of texting, past behaviour was the strongest predictor. Descriptive norms were important in both models indicating that the perception of peer norms influences these behaviours. In terms of the modifiable variables, their addition to both models contributed significant additional variance, with both perceived accident risk and anticipated regret being significant negative predictors. However, perceived police risk was not a significant predictor of either type of behavioural intentions.

## **Other Self-Reported Mobile Phone Activities while Driving**

Participants were provided with a list of mobile phone related activities and asked to report whether they had engaged in any of these activities on a hand-held phone while driving in the past week. The most common activities reported by the sample were as follows:

- playing music (77.8%);
- using a GPS navigation system (60.9%);
- using hand-held phone to make (39.9%) and receive (45.7%) calls;
- interacting on social media sites such as Facebook (21.2%);
- taking photos and videos (17.9%);
- and browsing the Internet (12.8%) while driving.

## **Awareness of ACT Road Rules**

Participants were asked to indicate whether aware of the following five rules related to drink driving and mobile phone use while driving in the ACT. The rules and the percentage of participants indicating awareness are presented below:



- Learner or provisional drivers must not drive with any alcohol concentration, i.e., Blood Alcohol Concentration (BAC) = zero **(99% aware of rule)**.
- Full licence drivers must not drive with a concentration of alcohol in their blood or breath of 0.05 grams or more **(98% aware of rule)**.
- All drivers must not send or receive text messages while driving, including while stationary but not parked, e.g., at the traffic lights **(92% aware of rule)**.
- Mobile phones may be used to make or receive a phone call (other than a text message, video message, email or similar communication) when the vehicle is moving if the body of the phone is secured in a mounting affixed to the vehicle while being used **(74% aware of rule)**.
- Mobile phones may be used to make or receive a phone call (other than a text message, video message, email or similar communication) when the phone is not secured in a mounting affixed to the vehicle and is not being held by the driver, and the use of the phone does not require the driver, at any time while using it, to press anything on the body of the phone or to otherwise manipulate any part of the body of the phone **(63% aware of this rule)**.

We conducted Chi-Square tests of contingencies to examine the differences in awareness of road rules across age, gender, and licence category. Overall, there were very few differences, however, males were less familiar with full licence BAC limits (rule 1) but more aware of the ability to make/receive phone calls when using a secure car mount (rule 3) compared to females. Participants aged 17-20 were more aware of the ability to make/receive phone calls using wireless capabilities (rule 4) compared to 21-24 year olds.

## CONCLUSIONS

The aims of this study were to examine the prevalence of drink driving and texting while driving among a sample of 17-24 year olds in the ACT region, and to examine the predictors of drink driving and texting while driving. The study also measured other ways drivers in this age group use their mobile phones while driving (besides texting) and their awareness of ACT Road Rules regarding drink driving and texting while driving.

### **Prevalence of Drink Driving and Mobile Phone Use While Driving**

Among those in our sample who drank alcohol, a third indicated they had driven in the past 12 months when possibly affected by alcohol, although only around 3% said they had done this frequently. Sixty percent indicated they had driven the morning after consuming alcohol when uncertain that alcohol was out of their body, with around 14% reporting doing this frequently. All participants (including non-drinkers) indicated whether they had been a passenger with a driver they knew had been drinking too much, and around 20% indicated they had done this at least once in the past 12 months.

Levels of texting while driving were much higher - over 70% of our sample reported that they had read at least one text message while driving during the past week and over 50% had sent at least one text message. The average number of texts sent while driving per week was 4.8. Reading text messages while driving was less prevalent, with the average number sent per week being 2.9.

We also asked our participants to indicate other ways they had used their mobile phone (excluding hands-free) while driving in the past week. The most common activities were playing music (78%) and using their phone for GPS navigation (61%). There were also significant numbers using their hand held mobile phones to make (40%) and receive (46%) phone calls.

### **Awareness of ACT Road Rules Regarding Drink Driving and Texting While Driving**

Participants generally demonstrated high knowledge of ACT Road Rules with respect to drink driving and texting while driving. Almost 100% of participants were familiar with the road

rules with respect to drinking and driving. Knowledge of the rules regarding texting while driving was also high, however lower than knowledge of drink driving rules. For example, 92% of participants knew that drivers must not send and receive text messages while driving (including stationary, but not parked).

### **Predictors of Drink Driving**

The full logistic regression model explained 28% of the variance in drink driving behaviour. Those on a full licence and who drank at hazardous levels were at increased odds of drink driving. Those high in sensation seeking were also at increased odds of drink driving, as were those who thought most of their friends would drink and drive. None of the other Theory of Planned Behaviour variables were significant predictors in the final regression model. Of the potentially modifiable variables, higher perceived accident risk and anticipated regret decreased the odds of drink driving behaviour, whereas perceived risk of being caught by the police was not related to drink driving.

### **Predictors of Intentions to Text While Driving**

Consistent with previous research, the Theory of Planned Behaviour variables contributed significantly to the explanation of intentions to text while driving. However, for both sending and reading texts, the contribution of these variables was modest. Of particular interest was the influence of descriptive rather than subjective norms. This suggests that for this age group the influence of peers may be more important than the influence of significant others, and that efforts to change these behaviours need to take this influence into account. The addition of perceived risk and anticipated regret contributed significantly to the explanation of both sending and reading text messages, once the Theory of Planned Behaviour and other background variables had been controlled for. In terms of perceived risk, it was the risk of having an accident rather than the risk of getting caught by police that predicted behavioural intentions. Anticipated regret predicted both reading and sending intentions, but was a particularly strong predictor with respect to sending. This is consistent with findings in other domains of road safety behaviours (e.g., speeding, see Koch, 2014) and has implications for the framing of road safety messages (discussed below).

### **Strengths and Limitations of Current Research**

One of the strengths of the current study was the assessment of three different types of risky driving behaviours (drink driving, reading texts and sending texts) in a sample of younger drivers. The study took into account a number of relevant background variables that have not always been considered in previous research. Our study also aimed to recruit a representative, community-based sample which, while it differed in some respects from the population distribution, did include participants from all relevant demographic categories. However, the nature of the sample limits generalisability to the entire ACT population of 17-24 year old drivers. We relied on self-report measures which may result in less accurate responding especially with respect to potentially sensitive questions regarding illegal behaviours. However, the use of an online survey should increase feelings of anonymity and ameliorate some of the effects associated with socially desirable responding.

### **Implications/Recommendations**

Drink driving levels were comparatively low in our sample although it is concerning that this behaviour still occurs. In particular, driving the morning after drinking was a commonly reported behaviour suggesting that young drivers may not be aware of the risks associated with this. Police and road safety organisations need to consider this particular form of drink driving when providing information and when enforcing road rules (e.g., timing of RBT). It was encouraging to see the strong knowledge in this sample of road rules concerning drink driving, suggesting communication of this information has been successful.

In our sample, levels of texting while driving were high. This was true of both reading and sending texts, although higher for reading. This was despite a high awareness of the road rules concerning texting while driving. The perceived risk of getting caught by the police was not a significant predictor of intentions to text while driving. This suggests that road safety awareness campaigns need to go beyond providing drivers with the rules. Our research suggests that the normative influence of the peer group is an important predictor of this behaviour. Therefore, road safety messages may be more effective if they present a message from peers, by peers. Our study also found effects for perceived accident risk and anticipated

regret on texting while driving intentions, suggesting messages that emphasise the consequences of texting while driving may be effective in addressing this behaviour

Our study highlighted the many other ways young drivers are using their mobile phones in addition to texting, with listening to music and using GPS being the two most common. Most previous research has examined either making/receiving mobile phone calls or texting while driving. With rapidly changing technology, young drivers are increasingly using their mobile phones for other purposes, and future studies could consider predictors of these other types of mobile phone use while driving. Road safety messages also need to ensure that these behaviours are targeted

It is important to perform research to test the efficacy of interventions and road safety messages based upon the variables identified in this study. Randomised controlled studies could be conducted comparing the effects of being exposed to road safety messages that emphasise peer group norms, risk factors, or anticipated regret. Comparisons could be made across message type in terms of the persuasiveness of the message and the effects on behavioural intentions. Likewise research should consider the effects of message source (e.g., authority versus member of peer group) and message medium (video, print, billboard etc).

## **Conclusions**

This study sought to examine the prevalence of drink driving and texting while driving among 17-24 year olds in the ACT region, and the predictors of these behaviours. The results suggest that texting while driving is common in this age group, and drink driving, while less frequent, is still occurring among a significant minority. Increased awareness of the crash risk associated with these behaviours along with reminders of the regret that might be associated with this could potentially lead to reductions in the prevalence of these risky behaviours. Perceptions of peer-related norms are also important and have implications for the delivery of messages about road safety.

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