Walking when intoxicated:

An investigation of the factors which influence individuals' drink walking intentions

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Abstract

Annually, in Australia, 10 to 15% of all road-related fatalities involve pedestrians. Of those pedestrians fatally injured, approximately 45% were walking while intoxicated or 'drink walking'. Drink walking is increasing in prevalence and younger persons may be especially prone to engage in this behaviour and, thus, are at heightened risk of being injured or killed. Presently, limited research is available regarding the factors which influence individuals to drink walk. This study explored young people's (17 to 25 years) intentions to drink walk, using an extended Theory of Planned Behaviour (TPB). Participants (N = 215), completed a self-report questionnaire which assessed the standard TPB constructs (attitude, subjective norm, perceived behavioural control) as well as the extended constructs of risk perception, anticipated regret, and past behaviour. It was hypothesised that the standard TPB constructs would significantly predict individuals' reported intentions to drink walk and that the additional constructs would predict intentions over and above the TPB constructs. The TPB variables significantly predicted 63.2% of the variance in individuals' reported intentions to drink walk, and the additional variables, combined, explained a further 6.1% of the variance. Of the additional constructs, anticipated regret and past behavior, but not risk perception, were significant predictors of drink walking intentions. As one of the first studies to provide a theoretically-based investigation of factors influencing individuals' drink walking intentions, the current study's findings have potentially significant implications for understanding young people's decisions to drink walk and the design of future countermeasures to ultimately reduce this behaviour.

Keywords: intoxicated pedestrian; drink walking; extended theory of planned behaviour; intentions

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1.0 Introduction

Annually, in Australia, 10 to 15% of all road related fatalities and serious injuries involve pedestrians (King, Soole, and Ghafourian, 2009). Of those pedestrians fatally injured, approximately 45% were reported as being intoxicated (i.e., drink walking) at the time of the crash (Australian Transport Safety Bureau [ATSB], 2001). These 'drink walkers' are at the highest risk of injury, and have the highest mortality and morbidity rates, of all road users (Öström and Eriksson, 2001). In particular, the risk of serious/fatal crash involvement when drink walking is highest when pedestrians are intoxicated to high blood alcohol concentration (BAC) levels. Evidence suggests that many pedestrians who are fatally injured have a BAC greater than .05 with approximately 80% of those above .05 having a BAC over 0.15mg/ml at the time of the crash (ATSB, 2001; Stewart, 1995).

Not a problem specific to Australia, drink walking has been identified elsewhere including, for instance, the United States and United Kingdom (Wilson and Fang, 2000). While cross-country comparisons of the drink walking problem reveal some similar features, such as the high levels of intoxication associated with pedestrian serious injury/fatality and males being at greatest risk of being killed in a pedestrian crash and for engaging in drink walking (ATSB, 2003, LaScala, Gerber, and Gruenwald, 2000), there are also differences between countries (Stewart, 1995; Wilson and Fang, 2000). For instance, an Australian review of seven studies of alcohol-involved pedestrians showed that the largest proportion of pedestrian casualties, who had high BAC levels, were aged 18 to 25 years (Holubowycz, 1995) and, more recently, evidence derived from coronial documentation for the years 1998 to 2002 indicated that the greatest number of intoxicated pedestrians fatally injured were males aged 15-24 years (ATSB, 2003). In contrast, in other industrialized nations, such as the

US and France, evidence suggests that the drink walking problem is one more likely to involve (in terms of serious injury/fatalities) older (male) adults (Fontaine and Gourlet, 1997; Stewart, 1995; Wilson and Fang, 2000). However, at the time of the review study in 1995, Holubowycz referred to the need for further research to help clarify the nature of the drink walking within Australia including the identification of those most at risk. Consistent with this need for further research, the current study seeks to understand more about drink walking within an Australian context amongst a cohort of younger adults (aged 17 to 25 years). Young adults are an at-risk group for engaging in risky alcohol-related behaviours, such as binge drinking (Johnston and White, 2003, 2004; Reavley, Jorm, McCann, and Lubman, 2011) which is itself a behaviour associated with higher levels of intoxication (i.e., $\geq$ .15mg/ml; Reavley et al., 2011), and such risky alcohol-related behaviours (and high levels of intoxication) heighten their risk of being seriously injured/killed in a pedestrian crash. Arguably this focus on young adults is warranted and needed to increase understanding of the factors influencing such risky behaviour and develop preventive measures.

There is some contention in the literature about the definition of drink walking due to the absence of a legal BAC limit for pedestrians in Australia (Hutchinson, Kloeden, and Lindsay, 2010). Some have suggested that drink walking would be best defined in accordance with the behavioural outcomes of, and impairments associated with, drink walking (e.g., decreased ability to detect gaps between traffic when crossing the road, lack of concern for one's safety; Oxley, Lenne, and Corben, 2006). Support for the stipulation of the 0.05mg/ml BAC limit in Australia for drivers has been based on evidence relating to the perceptual and cognitive impairments associated with the varying levels of intoxication (see Hutchinson et al., 2010). Thus, in the attempt to identify a more definitive and objective definition of the behaviour, some researchers (e.g., Lang et al., 2003) have defined drink walking in accordance with the legal blood alcohol concentration (BAC) ascribed to drink

driving. Specifically, drink walking occurs whenever a person walks in public with a BAC of

0.05mg/ml or above. The current research similarly adopts this definition.

In adopting this definition, it is acknowledged that intoxicated pedestrians are most at risk of

being injured or killed when walking with high levels of BAC (i.e., ≥0.15mg/ml). However,

evidence suggests that there are an array of potential threats to individuals' safety and well-

being and an overall heightened risk of injury associated with drink walking that represents a

concern to public health and safety more broadly. For instance, Lang et al., (2003)

interviewed 78 young Australian adults (aged 18-30 years) at licenced venues and found that

over half of the sample recalled falling over and stumbling, 23% reported sustaining injuries

(e.g., grazed knee/hands, sprained wrists/ankles), and 47% reported knowing someone else

who had been hurt while drink walking.

In the attempt to reduce potential harm to intoxicated pedestrians, a range of

situational and legislative interventions have been implemented including improvements to

roadsides (i.e., fencing and signalized crossings) around licensed premises and legislative

changes relating to the safe service of alcohol (Hutchinson et al., 2010). Despite the

implementation of these interventions, however, which are important in efforts to maximise

public safety, individuals are still choosing to drink walk. Ultimately, more effective, targeted

countermeasures which account for individual motivations are needed to reduce and/or

prevent drink walking behaviour. As such, the current research addresses this omission in

contemporary literature by adopting an extended version of a well-validated decision-making

model as a theoretical framework, the Theory of Planned Behaviour (Ajzen, 1991), to guide

this investigation of factors influencing individuals' drink walking intentions.

1.1 Theory of Planned Behaviour (TPB)

The central premise of the TPB is that an individual's intentions are the most proximal

influence on his or her behaviour, such that stronger intentions predict a greater likelihood of

behavioural performance. The theory proposes that a person's attitudes (i.e., favourable or unfavourable evaluation of the behaviour), subjective norm (i.e., perceived approval or disapproval from important others for behavioural performance), and perceived behavioural control (PBC; also thought to be a direct predictor of behaviour and which refers to the perceived ease or difficulty of behavioural performance) influence their intention to perform a given behaviour. In the case of drink walking then, based on the tenets of the model it would be expected that the more favourable one's attitude towards drink walking, the more one believes important others would approve of drink walking, and the more control and ease at which one believes they have over whether they engage in drink walking, the greater their intention will be to drink walk. Despite substantial support for the predictive utility of the TPB in relation to a range of health (e.g., Armitage and Conner, 2001; Godin and Kok, 1996; Johnston and White, 2003) and road safety (e.g., Evans and Norman, 1998, 2003; Manstead and Parker, 1995; Parker et al., 1992; Zhou, Wu, Rau, and Zhang, 2009) behaviours, the TPB on average explains only 39% of the variance in intentions and 27% of the variance in behaviour (Armitage and Conner, 2001). To compensate for the large proportion of variance left unaccounted for, Ajzen (1991) has stated that the TPB is open to the inclusion of additional constructs if they enhance the predictive ability of the model. As such, the current study extended the standard TPB model to incorporate the additional relevant influences of anticipated regret, past behavior, and perceived risk, all of which, as will be discussed, have been shown to influence decision-making in other risky road user behaviours.

1.2 Extended TPB Variables: Anticipated Regret, Past Behaviour, and Perceived Risk

Two constructs often included within extended TPB frameworks to enhance its predictive utility are anticipated regret and past behavior (e.g., Conner et al., 2007; Elliott and Thomson, 2010). Anticipated regret, the expected potential negative affect experienced by a person should they make the decision to perform a specific behaviour, is thought to be the

result of a person weighing up the possible outcomes due to (not) participating in behaviour (Abraham and Sheeran, 2003; Parker, Manstead, and Stradling, 1995; Sandberg and Conner, 2008). For instance, Evans and Norman (2003) found anticipated regret to be a significant negative predictor of intentions in road-crossing behaviour (when sober), thus the more likely people were to report feeling regretful (negative affect) for crossing the road, the less likely they were to report an intention to cross the road. In the context of drink walking, it could be expected that a person would be less likely to drink walk if he or she anticipated a potential detrimental effect of engaging in this behaviour, leading to a feeling of regret (i.e., negative affect). Alternatively, the opposite is also true; if a person perceives that drink walking will have a positive potential outcome and the potential benefits outweighed the possible costs, such as walking home to avoid paying a taxi fare, the individual would not regret his or her decision to perform the behaviour and would be more likely to drink walk.

Past behaviour has been shown to be a consistent, strong predictor of future behaviour (Conner, Warren, Close, and Sparks, 2006; Norman and Conner, 2006; Ouellette and Wood, 1998). For example, Norman and Conner (2006) and Connor et al.'s (2006) study found past engagement in alcohol consumption was a significant, positive predictor of intentions and subsequent drinking behaviour. Meta-analytic evidence exploring the utility of both anticipated regret and past behaviour as additional predictors in the TPB demonstrated also that once past behaviour was entered into the regression model, anticipated regret was no longer significant (Sandberg and Conner, 2008). In this vein, past behaviour is often considered to provide a more stringent test of the TPB (or extended TPB) constructs (Ajzen, 1991) and for this reason is included in the last step of the hierarchical regression model. When applied to drink walking, it could be assumed that this behaviour is the result of repeated experiences of drink walking, thus it turns into an automatic response when positioned in the familiar setting in which this behaviour occurs (Ouellette and Wood, 1998).

Alternatively, when behaviours, such as drink walking are not well-learned, conscious decision-making is required to undertake the behaviour to the extent that past engagement in the behaviour contributes to intentions to drink walk in the future (Ouellette and Wood, 1998).

Drawing upon previous evidence which had suggested that little public awareness of the risks of drink walking may exist (Lang et al., 2003; Oxley et al., 2006), the final construct to be added into the current study's extended framework was perception of risk. Perception of risk refers to an individual's subjective judgment about the level of risk associated with a particular situation. Previous evidence has found the construct of risk perception to be a significant predictor of intentions for road user as well as alcohol-related behaviours. For instance, intention to drive at an inappropriate speed was related to perceived driving ability and potential risk (Quimby, 1988). Thus, it could be expected that if an individual perceives drink walking to be relatively free of risks, they will be more likely to report greater intentions to drink walk.

1.3 The Present Study

Limited research has examined the motivational determinants of drink walking with even fewer (if any) studies basing their investigations within a sound theoretical framework. This gap in the literature is problematic to the extent that it prevents our understanding of the factors that motivate individuals' to intend to drink walk. Moreover, as noted previously, with younger adults at high risk of being killed while drink walking (ATSB, 2003), there is need for research to be directed at understanding more about what motivates these younger persons to engage in a behaviour. Increased understanding of the motivations underlying decisions to drink walk can, ultimately, inform the development of more effective, better targeted countermeasures to change the behaviour (Conner and Armitage, 1998). The current study, consistent with these aims, seeks to identify the motivational determinants of young people's

(aged 17 to 25 years) intentions to drink walk using an extended TPB including the standard (attitude, subjective norm, PBC) and additional constructs of anticipated regret, past behaviour, and perception of risk. Specifically, it is predicted that attitude, subjective norm, and PBC will all be significant, positive predictors of the intention to drink walk (Hypothesis 1). Further, based upon the study's extended TPB framework, it is also hypothesised that, anticipated regret and perception of risk will improve the prediction of intentions to drink walk over and above the original TPB constructs, with both constructs being negative predictors of intention (Hypothesis 2) and that past behaviour is expected to significantly positively predict intention, over and above all other variables (Hypothesis 3).

2.0 Method

2.1 Participants and Procedure

Before conducting the study, ethical approval was obtained from the University Human Research Ethics Committee. Participants ($N = 215$ of whom169 were females) were enrolled in an undergraduate psychology or nursing unit and were aged between 17 and 25 years ($M_{age} = 19.5$, $SD = 1.99$) (Table 1). Participants were recruited by members of the research team in person during lectures or electronically via notices placed on unit's on-line sites and invited to complete an online or paper version of the questionnaire. An information sheet given to participants prior to questionnaire completion outlined the topic of the study and explained the voluntary and anonymous nature of participation. A definition of drink walking (see section 2.2.1) was provided in all materials to ensure that individuals were consistent in their thoughts about what constituted drink walking and that such understanding was consistent with how the researchers themselves had defined the behaviour (Lang et al., 2003). Participants were offered a small token of appreciation (a chocolate) for their time and first year psychology students were eligible for partial course credit also.

[Insert Table 1 about here]

2.2 Measures

Unless otherwise stated, all measures were scored on 7-point Likert scales of 1 (*strongly disagree*) to 7 (*strongly agree*), and based on standard TPB measures (Ajzen, 1991). Higher scores on a measure indicated more of a construct.

2.2.1 Target Behaviour.

Consistent with Ajzen's (1991) TACT principle (i.e., target, action, context, time), the target behaviour of drink walking was defined as walking while under the influence of alcohol with a BAC of ≥.05, in the next month.

2.2.2 Demographics.

Demographic characteristics were assessed and included gender, age (in years), license status (*yes, no*), license type (*open, provisional, learners*), highest level of education attained (*high school, TAFE, undergraduate degree, postgraduate degree*), annual income, relationship status (*single, in a relationship, de facto, married, separated, divorced/widowed*), and ethnicity (*Caucasian, Aboriginal or Torres Strait Islander, Other*).

2.2.3 TPB Variables.

Three items measured *intentions* (e.g. 'I intend to drink walk in the next month') and were averaged to form a reliable intention scale ($\alpha =$. 86). Attitude was measured using four semantic-differential items adapted from Norman and Conner (2006) (e.g., 'For me, drink walking in the next month would be 1 *harmful* to 7 *harmless*). The four items formed an internally reliable scale ($\alpha = .91$). Two items measured subjective norm (e.g. 'People who are most important to me would approve of me drink walking in the next month') and were found to be significantly, positively correlated ($r = .79$). For PBC, two items measured this construct (e.g., 'It would be easy for me to drink walk in the next month') and were found to be positively and significantly correlated ($r = .74$).

2.2.4 Extended TPB Variables.

The three items measuring anticipated regret (e.g. 'My drink walking in the next month would make me feel sorry for doing it') were adapted from previous studies (e.g., Parker et al., 1992) and formed a reliable scale ($\alpha = .82$). One item was used to measure past drink walking behaviour (i.e., 'How often in the past month have you engaged in drink walking?'), scored on a 6-point scale from 1 (*never*) to 6 (*very often*). Perception of risk was measured using two items (e.g., 'If I engaged in drink walking in the next month there would be a risk involved') and these items were significantly and positively correlated ($r = .51$).

3.0 Results

3.1 Data Analysis Overview

A hierarchical multiple regression analysis was conducted to identify the predictors of individuals' intentions to drink walk in the next month. Specifically, the standard TPB variables of attitude, subjective norm, and PBC were entered in Step 1 of the analysis. The additional variables of perception of risk and anticipated regret were entered into Step 2, to examine whether these variables improved the predictive capacity of the model over and above the standard TPB variables. In order to determine the contribution of past behaviour after all other standard and additional TPB variables were accounted for, past behaviour was entered in Step 3. Analyses was performed using the Statistical Package for the Social Sciences (SPSS version 18.0).

3.2 Descriptive Analyses

In terms of past drink walking behavior, it was identified that 27.7% of the sample reported having never engaged in drink walking in the past month, with 19.2% and 11.7% reported rarely or not often having engaged in drink walking, respectively, in the past month. During the past month, 18.3% reported drink walking sometimes, and 13.1% slightly often. A smaller percentage of participants indicated they engaged in drink walking often (8.9%) and very often (0.9%) in the past month. On average, participants reported having moderately

high intentions to drink walk with the mean score falling just above the midpoint of the scale (M = 3.96, SD = 1.75, on a scale of (1) *strongly disagree* to (7) *strongly agree*). In terms of the location where participants reported they typically drank, a friend's house (24.6% often or very often) as opposed to a pub (14.4% often or very often) or at home (14.5% often or very often) was the most likely location. Given that males have been shown to be more likely to drink walk (LaScala et al., 2000), a preliminary check was conducted to see if males and females in this study's sample significantly differed in their drink walking intentions. If a significant difference was found, it would suggest that there may be a need to conduct separate analyses for males and females to better understand the influences of males' and females' drink walking intentions. However, an independent samples t test revealed no significant difference in intentions to drink walk between males (M = 3.94, SD = 1.85) and females (M = 3.96, SD = 1.73), t (213) = -.097, p = .41[1]. As such, the subsequent analyses used the whole sample.

3.3 Correlations between TPB Variables and Intention

Table 2 shows the bivariate correlations between the study's independent and dependent variables. As expected intention had significant and positive correlations with the standard TPB predictor variables, with PBC (r = .78), followed by attitude (r = .66), emerging as the strongest correlates. Also as expected, anticipated regret and perception of risk had significant, negative correlations with intention and past behaviour was strongly, positively correlated with intention.

[Insert Table 2 about here]

3.4 Hierarchical Regression Analysis Predicting Intention to Drink Walk

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[1] While there was not an equal number of males and females in the current study's sample, scale scores of males' and females' intentions indicated similar variability (i.e., SD's of 1.85 and 1.73 respectively) and there was a sufficient number of males in the sample to detect a difference should one have existed.

As shown in Table 3, at Step 1 of the hierarchical regression analysis, the standard TPB variables of attitude, subjective norm, and PBC explained a significant 63.2% (62.7% adjusted) of the variance in intentions to drink walk, $F(3, 203) = 116.19$, $p < .001$. Inclusion of anticipated regret and perception of risk at Step 2 contributed a further significant 2.8% of the variance explained in drink walking intentions over and above that accounted for by the standard TPB variables, $F(2, 201) = 8.43$, $p < .001$. The addition of past behaviour in Step 3 explained a further 3.3% of the variance in intentions to drink walk, $F(1, 200) = 21.82$, $p < .001$. Overall, the model explained a significant 69.4% (68.5% adjusted) of the variance in young people's intentions to drink walk, $F(6, 200) = 74.19$, $p < .001$. At the final step of the model, once all variables were entered, the significant predictors of young people's intentions to drink walk in the next month, in order of beta weights, were, PBC, followed by past behaviour, and anticipated regret (Table 3). Unexpectedly, attitude and subjective norm did not emerge as significant predictors at the final step of the model.

[Insert Table 3 about here]

4.0 Discussion

The aim of the present study was to address the paucity of research adopting a theory-based approach to understand young people's drink walking decisions. In this aim the predictive utility of the standard TPB as well as an extended framework which incorporated the additional variables of anticipated regret, past behaviour, and perception of risk, was tested to predict young people's intentions to drink walk in the next month. The implications of this research were significant to the extent that the findings may, ultimately, assist in guiding the development of more targeted, road-safety countermeasures that aim to reduce the incidence of drink walking in Australia. Overall, the results provided some qualified support for the predictive utility of the standard TPB variables. The additional variables also improved the predictive utility of the model in explaining young people's intentions to drink

walk over and above the contribution made by the standard TPB variables. These findings offer several possibilities for interventions to reduce young individuals drink walking intentions, and ultimately, drink walking behaviour.

4.1 Application of the TPB to Drink Walking

As expected, when examining just the standard TPB variables, with the exception of subjective norm, all significantly predicted young people's intentions to drink walk, although it should be noted that participants did not appear to have either strong or weak intentions to engage in this behaviour ($M = 3.95$ on a 7-point scale). Attitude was a significant predictor of intention in the first step of the model (but not in the second or final steps), therefore, the more positively respondents viewed drink walking, the more they intended to drink walk in the next month. Thus, it could be argued that if young people viewed drink walking less positively, perhaps more akin to how drink driving has come to be regarded over the years (ATSB, 2001), this change in attitudes may assist in reducing drink walking intentions. Given that subjective norm was not a significant predictor of drink walking intention in the current study, it appears that future research is needed to identify the normative influences impacting on young people's decisions to drink walk. Potentially the role of another normative component, such as group norm (e.g., the influence of what same aged peers think about drink walking and whether or not same aged peers actually drink walk; see Terry and Hogg, 1996) may be worth investigating.

As expected, and in line with previous research in the road-safety domain (e.g., Evans and Norman, 2003; Manstead and Parker, 1995; Parker et al., 1992), PBC was a significant predictor of young people's intentions to drink walk. This finding implies that the more a person had confidence in their ability to drink walk, the more they intended to drink walk in the next month. This finding supports a move towards focusing on individuals' perceptions of self-efficacy as a way to reduce drink walking intentions. For instance, education programs or

interventions need to reduce a young person's confidence in their ability to drink walk by highlighting that a higher BAC will result in increased stumbling and falling, injuries and fatalities; essentially, highlighting to them that they are not in as much control as they may first believe. Also, media campaigns could target young people's perception that drink walking can be easily done without consequence by challenging this belief and, in particular, increasing awareness about the difficulties of judging traffic and crossing-roads while intoxicated. Alternatively, campaigns or interventions could focus on increasing young people's efficacy in choosing alternatives to walking home when intoxicated (e.g., having a pre-arranged lift home).

4.2 Application of Additional Variables to Drink Walking

Partial support for the second and support for the third hypothesis was found with the additional variables of anticipated regret and past behaviour, but not perceived risk, significantly predicting young people's drink walking intentions. The absence of a significant finding for risk perception is in contrast to previous evidence which has shown that perception of risk contributes to intentions to perform a range of dangerous road-user behaviours, such as drink driving and speeding (Agostinelli and Miller, 1994; Jonah and Dawson, 1987; Otani et al., 1992). The finding that risk perception did not contribute to drink walking intentions may be due to the belief that drink walking poses little or no risk given the frequency at which this behaviour occurs in young people's immediate social context and the greater community. Alternatively, it is possible that participants may have made comparisons between drink driving and drink walking and came to the conclusion that drink walking presented little or no risk compared with drink driving. Arguably, this explanation is plausible in light of previous evidence which has suggested that limited public awareness of the risks of drink walking currently exist (Lang et al., 2003; Oxley et al., 2006). The results of the current study suggest that, there would be value in designing more interventions to focus on drink

walking in the first instance and for those interventions to aim for raising awareness about the prevalence of drink walking-associated injuries and fatalities each year. Part of achieving this aim may be to debunk potential myths associated with drink walking such as, for instance, that drink walking is a 'safer' alternative to drink driving.

As expected, anticipated regret emerged as a significant negative predictor of intention to drink walk suggesting that young people, who perceive the outcomes of drink walking to be negative, are less likely to have intentions to drink walk, compared with those individuals who associate drink walking with more positive outcomes. To strengthen the association between negative outcomes and drink walking, future interventions should focus on educating young people about the consequences of drink walking with a BAC above the legal driving limit (i.e., >.05) and aim to encourage young people to consider the potential negative consequences of drink walking, such as being hit by a car or being fatally injured, and whether these negative consequences outweigh the perceived positive benefits of drink walking (e.g., avoiding a taxi cab fare).

Consistent with much previous research demonstrating past behavior as a significant positive predictor of intentions (Conner et al., 2006; Norman and Conner, 2006), this study showed that past drink walking behaviour predicted future drink walking intentions. This finding suggests that, when developing interventions to target and reduce the incidence of drink walking in younger age groups, explicit attention needs to be directed towards acknowledging the existence of past engagement in this behaviour and attempting to change this behaviour by highlighting alternatives (e.g., taking public transport and/or arranging a designated sober member of the group to ensure everyone arrives home safely). Hutchinson et al. (2010) highlight also the potentially important role of the broader community context in devising alternatives to engaging in drink walking, such as licensed premises offering

transportation for their patrons and ensuring greater public transport is available in the times that it is most needed.

4.3 Strengths and Limitations

This study represents one of the first studies to provide a theoretically-based investigation of drink walking behaviour. Given the serious risks associated with engaging in this behaviour as well as the limited research attention that has been received thus far in relation to understanding the factors influencing drink walking, this study addresses an existing gap in research evidence. More specifically, this study has demonstrated the utility of the TPB framework together with the additional constructs of anticipated regret, past behaviour, and perceived risk in predicting individuals' intention to drink walk. As supported by evidence that younger individuals are at high risk of being involved in drink walking-related crashes, this study focused only on individuals aged 17-25 years, thus, the findings are relevant to an age group likely to engage in the behaviour in Australia (Holubowycz, 1995) as well as engage in other risky alcohol-related behaviours, such as binge drinking (Johnston and White, 2003, 2004; Reavley et al., 2011).

In addition, this study adds to the available evidence which illustrates the dangers of drink walking, and also provides some understanding of the factors which may encourage or discourage young people to drink walk. As such, future public education and mass media advertising messages may be able to draw upon the current study's findings to devise more targeted messages. Despite these strengths, there are also some limitations, which should be addressed in future research.

Although the sample targeted in the current study were young people, this study captured the responses of mainly Caucasian individuals who were undertaking tertiary studies. Future studies would benefit by having a more inclusive young population to enhance the generalisability of the research. Further, contrary to expectations, there was no significant

difference in drink walking intentions found between males and females in this sample. This finding may be a reflection of the drinking culture in Australia with little difference in the frequency and quantity of alcohol consumption between male and female university students (e.g., Davey, Davey & Obst, 2002), and the rising prevalence of binge drinking in young males and females (e.g., Sheehan & Ridge, 2001). The latter is of particular concern for young females given that females drinking at similar levels to males are likely to experience greater intoxication and subsequent harm/injury. Future research, however, may benefit from ensuring a study sample comprised of a more balanced gender distribution.

Lastly, some limitations relate to the study's measures. There are well known limitations inherent in survey research including the possibility that asking questions about a behaviour that is viewed positively increases the likelihood that the behaviour will be performed (i.e., mere measurement effect; Godin et al., 2010). In relation to TPB studies, the structuring of some TPB questions, particularly those related to subjective norm, has been shown to be confusing for some people (Darker and French, 2009); however, this study was conducted with the general public and it is likely that undergraduate students are more familiar with the structuring and wording of questionnaires, generally. While the current study assessed past drink walking behaviour, and controlled for its effect within the regression model, to the extent that statistics indicate that serious crashes involving intoxicated pedestrians often occur when pedestrians are impaired with high BAC levels, with such high BAC levels indicative of more problematic alcohol use/abuse (Hutchinson et al., 2010), it would also be important to assess an individual's past drinking behaviour. In addition, this study did not measure the actual behaviour of drink walking and, instead relied upon individuals' self-reported intentions to drink walk. There are well-acknowledged limitations and biases associated with self-report measures; however, studies assessing actual drink walking behaviour would be associated with practical and ethical challenges.

Furthermore, evidence suggests that while not perfect predictors, intentions still represent strong and consistent predictors of behaviour (Armitage and Conner, 2001).

4.4 Conclusion

Overall, the findings from the present study offer some support for the predictive utility of the extended TPB framework in explaining young persons' intentions to drink walk. Specifically, an extended version of Ajzen's (1991) TPB model showed perceived behavioural control, anticipated regret, and past behaviour as predictors of young people's (aged 17-25 years) intentions to drink walk. Ultimately, these findings provide further insight into some of the motivational factors underlying individuals' drink walking intentions, and may assist the development of future research and countermeasures designed to reduce the extent to which intoxicated pedestrians are involved in road trauma.

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Table 1

Demographic Characteristics (N = 215)

Variable	Classification	*M*	*SD*	Range	*N* (%)
Age (years)		19.17	.42	17-25	
Gender	Male (1)				48 (22.1)
	Female (2)				169 (77.9)
Licence	Open (1)				41 (18.9)
	Provisional (2)				104 (47.9)
	Learners (3)				60 (27.6)
Level of Education	High School (1)				180 (82.9)
	TAFE (2)				12 (5.5)
	Undergraduate degree (3)				19 (8.8)
	Post-graduate degree (4)				1 (.5)
Yearly income	$0- $20, 000 (1)				185 (85.3)
	$20,001- $40,000 (2)				20 (9.2)
	$40, 001- $60,000 (3)				6 (2.8)
	$60,001- $80,000 (4)				2 (.9)
	$80,001- $100,000 (5)				-
	>$100,001 (6)				1 (.5)
Relationship status	Single (1)				122 (56.2)
	In a relationship (2)				87 (40.1)
	De facto (3)				5 (2.3)
	Married (4)				3 (1.4)
	Separated (5)				-
	Divorced/widowed (6)				-

Table 2

Correlations, Means, Standards Deviations (and Reliabilities) for the Extended TPB Predictors and Drink Walking Intention (N = 215)

Variable	*M*	*SD*	1	2	3	4	5	6	7
1. Attitude	4.07	1.59	(.91)	.54***	.71***	-.49***	-.71***	.55***	.66***
2. Subjective norm[b]	3.18	1.57		(.79***)	.54***	-.33***	-.44***	.44***	.51***
3. PBC[b]	4.47	1.84			(.74***)	-.42***	-.69***	.63***	.78***
4. Perception of Risk	4.24	1.45				(.51***)	.55***	-.27***	-.37***
5. Anticipated regret	3.05	1.58					(.82)	-.61***	-.68***
6. Past behaviour[a]	3.49	1.33						-	.68***
7. Intention	3.96	1.75							(.86)

[a] *= 1-item scale.* [b]*=2-item scale, therefore, reliability based on bivariate correlation.*

*p < .05. **p < .01. ***p < .001.

Table 3

Hierarchical Multiple Regression Predicting Intentions to Drink Walk

Step and variable	B	SE	β
Step 1 Attitude	.20	.07	.18**
Subjective norm	.10	.06	.09
PBC	.57	.06	.60***
Step 2 Attitude	.09	.08	.08
Subjective norm	.11	.06	.10
PBC	.49	.06	.51***
Perception of risk	.09	.06	.07
Anticipated regret	-.30	.07	-.27***
Step 3 Attitude	.07	.07	.07
Subjective norm	.09	.06	.08
PBC	.40	.06	.42***
Perception of risk	.05	.06	.04
Anticipated regret	-.20	.07	-.18**
Past behaviour	.34	.07	.25***

p < .05. **p* < .01. ****p* < .001.