



## COVER SHEET

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# **DRINK-WALKING: AN EXAMINATION OF THE RELATED BEHAVIOUR AND ATTITUDES OF YOUNG PEOPLE**

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## **Abstract**

While huge inroads have been made into the drink driving problem in Queensland over the last decade, the prevalence of alcohol-related pedestrian crashes has been steadily increasing. Young people (17-29 years) are over-represented in this type of pedestrian crash. A study of 534 people, including 328 participants aged 17-24 years old, was conducted to examine the issue of drink-walking as part of a larger program of research examining youth and risk-taking behaviour. The study involved breath testing and surveying patrons as they left selected licensed premises. Survey items addressed past experiences of drink-walking behaviour, knowledge and perceptions of the dangers and legal consequences associated with both drink-walking and drink driving, trip planning, and factors influencing the modal choice. Results revealed that young people are more likely to drink-walk and rated the likelihood of being hurt whilst drink-walking on or near roads as lower than participants over 24 years of age. However, 53% of under 25 years old recalled situations in which they or another person had been hurt whilst drink-walking. The implications of the findings for the design of educational campaigns and other interventions are discussed.

## **1. INTRODUCTION**

The use of alcohol increases the likelihood of crash involvement (Clayton et al. 2000; Holubowycz 1995a) and has long been recognised as a strong contributing factor in pedestrian crashes (Levy et al. 2000; Stockwell et al. 2002). Importantly, alcohol-impaired pedestrian crashes continue to present a challenge to road safety practitioners because of the difficulty of measuring and modifying behaviour in this area (Clayton and Colgan 2001) and the lack of known effective countermeasures (Wilson and Fang 2000).

While figures vary from state to state, nearly 45% of Australian pedestrians fatalities involve alcohol, i.e., having a blood alcohol content (BAC)  $\geq .05\text{mg/ml}$  which is the legal driving limit for drivers with an open licence in Australia (ATSB 2001; FORS 1997). In addition, the number of drink-walking fatalities has not declined at rates consistent with the decrease in drink driving casualties (Clayton et al. 2000; Holubowycz 1995a; Stewart 1995; Wilson and Fang 2000) and some studies indicate that the number and relative proportion of alcohol-affected pedestrian casualties has increased in recent decades (eg. Clayton and Colgan 2001; Clayton et al. 2000).

Furthermore, the level of intoxication detected in fatally and seriously injured pedestrians tends to be very high, with over 80% having a BAC above  $.15\text{mg/ml}$  (ATSB 2001, 2003; FORS 1997).<sup>1</sup> These findings may be related to the pedestrian's risk of crash involvement increasing at BAC levels over  $.10\text{mg/ml}$  (Clayton and Colgan 2001). High BAC levels may also be related to the large numbers of

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<sup>1</sup> This estimate may be affected by sampling bias. A substantial proportion of pedestrians are not tested or results are not recorded (ATSB 2001; Fraine 1995) due to legislative differences (Holubowycz 1995b). Hence a higher proportion of severely impaired pedestrians may be tested for their BAC in the first place.

Australians who engage in binge drinking (Lang et al. 1992). In addition, the high media profile and enforcement levels associated with drink driving may have inadvertently increased the likelihood of walking (Fraine 1995) especially after engaging in binge drinking behaviour.

Much of the evidence regarding the demographic characteristics of “drink-walkers” identifies people under 30 years of age as a high-risk group. International evidence indicates that over two-thirds of young adult pedestrians killed in Great Britain (Tunbridge and Keigan, 2002) and Sweden (Öström and Eriksson 2001) were alcohol affected. In Australia, Fraine (1995) reports that young adults comprise over one third of the total pedestrian fatalities and one half of these pedestrians test positive to alcohol (see also ATSB 2003). In a review of seven Australian studies of alcohol-involved pedestrians, Holubowycz (1995b) reports that the largest proportion of pedestrian casualties who have high BACs (>.15mg/ml) are aged 18-25 years.

Drink-walking crashes occur mostly at night and at the end of the week (ATSB 2003; Clayton and Colgan 2001; Öström and Eriksson 2001; Wilson and Fang 2000). Both the incidence and mean level of pedestrian intoxication increases with time of day, reaching a peak around midnight (Clayton et al. 2000; Tunbridge and Keigan 2002). The ratio of young people affected by alcohol also increases with time of day, with more young people drink-walking later in the night (Clayton et al. 2000).

Finally, alcohol-involved pedestrian crashes cluster around hotels and bars and are related to the number of licensed venues per kilometre of road (LaScala et al. 2000). Hotels and taverns have been identified as high risk venues for high alcohol consumption and alcohol-related injury (Lang et al. 1992). Yet, Fontaine and Gourlet (1997) note that there is limited knowledge about the circumstances under which people become intoxicated and effective countermeasures cannot be developed until our understanding of alcohol-affected pedestrian behaviour improves.

This exploratory study examines the behaviour and characteristics of young drinking pedestrians, their perceptions of the risk associated with drink-walking and the factors that may affect their decisions to walk at the times these decisions are made.

## **2. METHOD**

A total of 534 exit-interviews were conducted with patrons of 12 Brisbane drinking venues (nightclubs, bars and pubs). The interviews were conducted on Thursday, Friday, Saturday, and Sunday nights by interviewers trained in the use of the interview tool and a hand-held breath alcohol measuring instrument (alcometer). Most of the interviews were conducted on Saturday (n =246). Patrons were approached, provided with details of the study (verbally and in writing) and asked to participate. It was then confirmed with patrons, who agreed to participate, that they were leaving that venue for the night before the interview began.

### **Selection of venue**

Selection of the venues was informed by a range of factors. Typically the venues chosen were frequented by young people, were in a range of inner-suburban and city locations, were accessible by road and public transport, and were managed by staff who were supportive of the research.

### **The interview tool**

The interview took approximately 10 minutes. The items used in this study were developed from a previous pilot study of 74 patrons at one drinking venue (Lang et al, 2003). Qualitative and quantitative items were used to examine travel and drinking behaviours prior to the interview, transport plans for the remainder of the night, factors influencing transport choice on the night, and usual drinking patterns. Participants were informed that in the present study drink-walking referred to walking on or next to the road after consuming enough alcohol to be over the legal driving limit. Understanding of drink-walking and perception of risk associated with drink-walking and other road behaviour, including details of any incidents they could recall in which they or another person was hurt whilst drink-walking, were recorded. Limited demographic details were also collected.

During the interviews, participants were provided with a wallet-sized “standard drinks” card to assist them with answering some of the questions. This card is produced by the Australian Transport Safety Bureau and shows examples of standard drinks (eg. size of a full strength beer, wine). Participants were able to keep this card.

At the completion interviews, participants were offered the opportunity to provide a breath sample for alcohol content analysis. Lion Alcolmeter S-D2 machines, disposable mouthpieces (one per participant) and gloves were used. Participants were informed of their BAC reading (if interested) and reminded of the legal driving limits on open and provisional licences. Participants were given a \$5 meal deal voucher (for popular take-away stores) in appreciation of their time. Ethics approval via the University Human Research Ethics Committee was obtained prior to the commencement of the study.

### **3. RESULTS**

Three hundred and twenty five (61%) of the participants were young people (under 25 years old) and 182 (56%) of these young people were male. Ninety-one percent of the sample held a driver’s licence and 81% reported having access to a vehicle. Most participants reported being engaged in full-time employment (n = 266) or study (n = 133).

#### **Previous venue and transport to study venue**

Prior to the interview, most participants reported being at another pub or night club (27.9%), their own home, (17.8%), another’s home (7.5%), or work (6.6%). Approximately half (53%) of the sample reported drinking alcohol prior to arriving at the survey venue. Table 1 shows the percentage of people who drank prior to arriving at the venue, and the transportation mode used to get there. Walking was the most common mode amongst the sample, with 46.0% of those participants who had consumed alcohol at the previously venue selecting this mode and 35.2% of those who did not consume alcohol choosing it.

Table 1: Alcohol consumption at previous venue and transport to current venue

<i>Transport Mode</i>	<i>Drank at Previous Venue</i>	<i>No Alcohol Consumption</i>
Walked	46.0	35.2
Passenger (car)	20.9	21.9
Taxi	15.6	6.4
Public transport	10.1	9.7
Drove self	6.6	25.5
Not selected	0.8	1.3

### **Next venue and transport arrangements**

The next intended venue for most participants was another pub or night club (42%), or their own home (39.1%). Participants were generally walking (45.7%). Table 2 displays the percentage of people choosing each transport mode by BAC. For example, among the participants with illegal BAC, 46.8% had planned to walk to the next venue while 21.5% intended to drive.

Table 2: Blood alcohol content and planned transport to next intended venue.

<i>Transport Mode</i>	<i>Over .05 BAC</i>	<i>Under .05 BAC</i>
Walking	47.5	46.8
Taxi	29.3	8.5
Public transport	9.5	7.2
Passenger	8.7	15.6
Drive self	3.7	21.5
Not selected	1.3	0.4

There were no differences between young drivers (those aged between 17-24 years old) and those aged 25 years and above in terms of whether they had walked to the venue [ $\chi^2 (2) = 2.12$ , ns] or whether they intended to walk to the next place [ $\chi^2 (2) = 2.52$ , ns]. Most young people who had BAC over 0.05 mg/ml were travelling with a group of friends (49.5%) or with one friend (27.9%). Only a small number of young people in this group were travelling alone (12.6%), or with a partner (9.0%).

### **Young people and planning**

Most young people reported that they generally made travel arrangements before going out to drink at least half of the time (65.6%) but 20.7% never planned before going out to drink. When asked which single factor most influenced how they planned their transport on the night of the interview, young people commonly referred to commitments tomorrow (11.3%), cost of taxis (10.1%), where they were going for a drink (8.5%) and the arranged designated driver (8.5%). Safety concerns were mentioned as the main factor for planning by only 8.2% of the sample. Participants reported that the factors that were most likely to change their plans once they were out were: friends changing their plans (85.3%); enjoying the evening more than expected (80.6%); running out of money (60.9%); having another offer of transport (51.8%) and feeling too intoxicated (47.1%).

### **General alcohol use and drinking away from home**

The reported amount of alcohol consumed each week varied from none to 80+ standard drinks and, on average, males ( $M=22.20$ ,  $SD=25.15$ ) drank more than

females (M=9.13, SD=9.38). Most young people indicated that they drank away from home between 1 and 5 times every month (52%), a further 25.6% reported that they drank away from home between 6 and 10 times in a month, and 18% indicated that they drank away from home more than 10 times in a month. Only 2.4% of young people indicated that they never drank alcohol. Compared to participants aged 25 years or older (M = 9.27, SD = 17.46), young people (M = 13.52, SD = 17.09) reported more instances of drink-walking in the previous three months [t(510) = -2.697, p<.05]. Only 13.1% of young people responded that they had not drink-walked, as defined in the study, in the last 3 months.

### Perceived Risks of Drink Walking by Young People

Respondents were asked to rate a number of pedestrian-related behaviours on a 5-point Likert scale from 'not dangerous' (=1) to 'extremely dangerous' (=5). Young people viewed walking *on* the road after drinking sufficient alcohol to be over the driving limit as less dangerous than their older counterparts (see Table 3). There was no significant difference between the groups on the perceived danger of *crossing* the road after consuming a similar amount of alcohol.

Table 3: Mean Ratings of the dangers of walking with a BAC >.05

<i>Dangers</i>	<i>17-24 yrs old</i>	<i>25 &amp; Above</i>	<i>P-value</i>
Walking on the road	3.60	3.98	0.001
Walking beside the road	2.69	2.99	0.004
Crossing the road	3.11	3.30	0.075

The participants were also asked to rate the dangers involved in performing other behaviours while affected by alcohol. The young people in the sample considered riding a bicycle while under the influence of alcohol (BAC> 0.05), speeding, not wearing a seatbelt and driving when tired each significantly (p < 0.001) more dangerous than walking on, beside, or crossing the road while under the influence of alcohol.

Compared to older participants, young people reported higher perceived likelihoods of injuring themselves in a general sense [t(294) = -3.108, p<.05] or getting lost [t(514) = -2.099, p<.05]. This difference may be related to the observation that a significantly ( $\chi^2$  (2) = 6.70, p<.05) greater number of participants aged 17-24 years (25.9%) reported having been hurt in a general sense (eg. personal injury) whilst drink walking than those aged 25 years and older (16.2%). However, there were no differences between the groups regarding whether they knew someone who had been hurt whilst drink-walking [ $\chi^2$  (2) = 5.52, ns].

Young people reported engaging in drink-walking (M = 13.52, SD = 17.09) more often in the past 3 months than drink driving (M = 1.69, SD = 6.32) and this difference is statistically significant [t(309) = 12.738, p<.001]. They also stated that they could drink a greater number of standard drinks and walk safely (M = 6.47, SD = 4.14) compared to the number of drinks they could consume and drive safely (M = 2.70, SD = 2.04); this difference is also statistically significant [t(303) = 16.593 and p<.001].

### **Perceived risks of drink walking and the environment surrounding the licensed venue**

Correlational statistics were utilised to determine whether young people's perception of the risk of drink-walking is related to how busy, well-lit and populated they perceive the area surrounding the licensed venue to be. A composite measure of the perceived dangers of drink-walking was calculated by taking the mean of the three items examining the dangers of walking on, beside and crossing the road after drinking alcohol.

This drink-walking composite measure was positively correlated with the busyness of the surrounding roads [ $r = .258, p < .01$ ], such that drink-walking was perceived as more dangerous when the roads were busier. The dangers of drink walking was also positively correlated with the number of people who can be seen in the area [ $r = .159, p < .01$ ] implying that young people rated drink-walking in an area where more people were visible as more dangerous. Although the mechanisms underpinning this remains unclear; it could be an artefact and may be indicative of other factors associated with the location of the venue. The dangerousness of drink-walking was not correlated with how well-lit the area was considered to be [ $r = .022, ns$ ].

### **Comparison of BAC readings between 17-24 year olds and 25 years and older**

Half of all participants (50.5%) had a measured BAC of 0.05 mg/ml or higher, and 16.9% had a BAC reading of 0.10 mg/ml or higher. There was no difference between the measured BAC readings of the two age groups on the night of the survey [ $t(303.018) = 1.738, p > .05$ ]. In addition, there was no difference in the self-reported weekly average number of standard drinks consumed between the two age groups [ $t(513) = .707, ns$ ].

### **Comparison of estimated and actual BAC**

The correlation between participants' estimated BAC and their recorded BAC (via the Alcolmeter) was calculated. The two variables were positively correlated [ $r = .378, p < .01, n = 429$ ] and this correlation was only slightly higher [ $r = .401, p < .01, n = 272$ ] for young people.

## **4. DISCUSSION**

Although cars seemed to be a highly assessable mode of transport for those interviewed, walking was the most common form of transport for those who had been drinking. Many of the young people in the sample were heavy drinkers and the majority reported drink-walking at least once a month. On the night of the interviews, approximately half of the young people leaving the venue were alcohol-impaired ( $BAC \geq .05\text{mg/ml}$ ).

While young people reported that drink-walking can be dangerous, it was considered less dangerous than drink driving, driving unlicensed, not wearing a seatbelt, speeding, driving when tired and riding a bicycle after drinking. This group also recognised that there were dangers associated with drink-walking, but were more likely to focus on injury or robbery than road safety dangers. These ratings of risk may be related to actual experience as over one quarter had injured themselves and almost half had reported knowing someone who had been injured whilst drink-walking.

As the perception of risk associated with drink-walking is low among young people, appropriate countermeasures appear to fall into one of two categories. First, environmental countermeasures that do not rely on the actions of the drink walker may be useful. Examples include the provision of fencing or other pedestrian facilities that separate pedestrians from motorised traffic (see also Levy et al. 2000; Öström and Eriksson 2001; Stewart 1995) in areas where bars cluster (LaScala et al. 2000), and adequate lighting to assist drivers to see pedestrians who may be on the road. Another possible solution is providing widespread education to drivers to be alert when alcohol-impaired pedestrians are likely to be present (see Levy et al. 2000; Stewart 1995). Traffic calming devices could also be implemented to this effect (Wilson and Fang 2000).

Second, countermeasures that are aimed at the drink walker may, at this stage, be best focused on raising the awareness of the problem of drink-walking. Information provided via public education about the road and transport related dangers of drink-walking should be linked to messages about other types of potential harm eg. assault, as this sample cited personal injury via falls and assaults as being of greater concern than pedestrian crashes. In addition, the lack of knowledge about drink-walking, low ratings of the related risks and the association with “out of control” drinking suggest a need to focus education on crash risk at moderate intoxication levels. Finally, while away from home, most young people drink alcohol and travel with their friends, and often change their travel plans to suit their friends. Therefore programs targeted at peer groups may be valuable and could incorporate the participants’ suggestion of having a “sober-walker”, a person who did not drink alcohol (or not drink heavily) who could accompany intoxicated friends to ensure their safety.

There are a number of limitations related to the applicability of this research other populations. The study was conducted at city, and inner suburban venues of Brisbane and caution should be taken generalising the results to other areas. Additionally, the research was conducted over the three month period of March, April, and May in 2003 and seasonal variations in drinking and transport patterns have not been considered. Further research would assist in determining the applicability of these results.

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Drink walking, alcohol, pedestrians, exit surveys, Blood Alcohol Content