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Driving and clubbing in Sydney: A study of drug use and risk among nightclub attendees

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DRIVING AND CLUBBING IN SYDNEY: A STUDY OF DRUG USE AND RISK AMONG NIGHTCLUB ATTENDEES

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EXECUTIVE SUMMARY

'Ecstasy' (3,4-methylenedioxymethamphetamine or MDMA) was originally synthesised in 1914, but has recently gained popularity as a drug often associated with the nightclub and dance party scene. Research has shown that ecstasy and related drugs (ERD) are mostly taken in the dance/nightclub environment where the stimulant and hallucinogenic effects are best appreciated (Degenhardt, Barker & Topp, 2004, Dunn, Degenhardt & Stafford, 2006). The majority of these venues have limited opening hours and as some of the effects of ERD can last for a considerable amount of time it can be assumed that patrons may still be under the influence of drugs at closing time and as they head home.

There is limited literature on the effect of ERD on driving, with much more research required in order to increase understanding of the impairing effects of these drugs. Experimental studies of the acute effects of a single dose of MDMA on psychomotor performance and actual driving behaviour have suggested small improvements in certain aspects like tracking in compensatory tracking tasks, and weaving in an on-the-road driving task (Lamers et al., 2003; Ramaekers, Kuypers & Samyn, 2006). Other aspects like time to contact estimation, and speed adaptations in an on-the-road car following task, were seen to deteriorate. Similarly, experimental studies suggest that methamphetamine has the potential to increase risk-taking, and can result in inappropriate and dangerous driving behaviour, such as speeding and carelessness. There is also reasonable evidence to suggest that driving after using cannabis, a drug commonly used among night-club attendees, probably increases the risk of motor vehicle accidents (Hall, Degenhardt & Lynskey, 2001).

Both impaired driving and being a passenger of an impaired driver appear to be common occurrences among nightclub/dance party attendees. An Australian study of 216 ecstasy users found about half of the sample (49%) admitted to having driven a motor vehicle shortly after ecstasy use, and half of this subgroup (49%) believed that the drug had a detrimental influence on driving ability (Gascoigne, Copeland & Dillon, 2004). Likewise in a recent Victorian study of nightclub attendees around one in ten participants reported that on the night of interview they would either drive under the influence or be driven by so

meone under the influence of alcohol (10%), cannabis (11%), and/or methamphetamine (8%) (Degenhardt et al., 2006).

In an attempt to address concerns about the occurrence of illicit drug use among drivers, the New South Wales Government passed legislation in October 2006 that would allow the conduct of random roadside drug testing (RDT). This was to be completed by means of a saliva test, for three illicit drugs: THC (the main active ingredient of cannabis), methylamphetamine (a drug variously sold as 'speed' methamphetamine powder, 'base' methamphetamine, or 'crystal' methamphetamine), and methylenedioxymethamphetamine (MDMA or ecstasy). The *Road Transport Legislation Amendment (Drug Testing) Act 2006* commenced on 13 December 2006. While legislation allows for random testing, it is likely that New South Wales Police activity will be intelligence driven, targeting drug screening at locations where high-risk drivers are likely to present, in order to maximize the potential benefit and efficiency of the legislation.

In anticipation of the introduction of roadside saliva testing in NSW, this study was conducted in November 2006 to examine the prevalence of illicit drug use among nightclub attendees in Sydney, NSW; their transport methods; and their histories of drug use and driving. A subsidiary aim of this study was to establish a 'baseline' against which future studies might be able to compare drug use and driving behaviour after the introduction of testing.

In total, 419 persons were interviewed for the study. Three-quarters of the sample were male (75%) and they were, on average, 23.5 years old. Most were single (79%), with 17% reporting that they were currently married or in a defacto relationship. Three in four of the sample (74%) reported that they had completed high school. Drug use was common among this sample. The most commonly reported drugs used on the last clubbing occasion were alcohol (71%), ecstasy (47%), methamphetamine powder (24%), and cannabis (15%). Participants reported a variety of means of transport to the venue on the last clubbing occasion. Participants most commonly reported driving themselves (28%), getting a lift with someone (22%), or using public transport (17%) to get to the venue. Similarly the most common means of getting home on the last clubbing occasion were driving themselves (27%),

being driven by someone else (21%) or taking a taxi (24%). The level of taxi usage is quite high, and is probably indicative of inner city users with short distances to travel for whom taxis use is appropriate and affordable.

Notable proportions reported having driven under the influence of ecstasy (15%), methamphetamine powder (9%), alcohol (9%) or cannabis (5%) on their last clubbing occasion. Similarly, many reported having been a passenger of someone under the influence of ecstasy (22%), alcohol (15%), methamphetamine powder (14%) or cannabis (12%) on that occasion.

Eighty-five percent of participants reported that they had heard of roadside drug testing. Large proportions of participants correctly thought that the test would detect the use of ecstasy (86%), methamphetamine powder (78%), crystal methamphetamine (62%) and cannabis (78%). There was some error, however, in the drugs that participants thought could be detected by the test, with around two in five thinking that the test could detect heroin (40%) and three in five believing it could detect cocaine (61%).

All participants were asked if roadside drug testing would change their clubbing and driving behaviour. Over a third of the sample indicated that it would change their behaviour: 8% reported that they wouldn't use drugs if planning to drive, 6% reported that they would wait 2–3 hours before driving after taking drugs and 18% reported that they would not drive if they were clubbing. Of the 18% who would not drive if taking drugs, 46% reported they would catch a taxi, 39% reported that they would catch public transport and 14% would get someone else to drive them. Importantly, 46% of those with a drug driving history reported that the test would change their clubbing behaviour, highlighting the potential of RDT to be an effective prevention strategy with favourable public health implications.

The NSW Government supports a 'harm minimisation' approach to drug use. This legislation is designed to focus on road safety and prevention, rather than drug detection, aiming to deter NSW drivers who have recently used cannabis, methamphetamine and MDMA from driving a vehicle, based on the possibility of getting caught. The legi

slation regarding RDT states that the Police have the power to require a person to undergo one or more oral fluid tests for prescribed illicit drugs if the officer believes the person:

a) is or was driving a motor vehicle on a road or road related area, or
b) is or was occupying the driving seat of a motor vehicle on a road or road related area and attempting to put the vehicle in motion, or
c) being the holder of a driver licence, is or was occupying the seat in a motor vehicle next to a holder of a learner licence while the holder of the learner licence is or was driving the vehicle on a road or road related area.

The findings of the current study suggest that the introduction of roadside drug testing in NSW may have positive impacts upon drug use and driving risk behaviours among a sample of young persons attending nightclubs. It will be of interest to examine whether the intentions of such persons to change their behaviours are borne out following the introduction of RDT.

The success and continued impact of the operation amongst young clubbers will be dependent on ensuring that testing is just part of an overall education program. Targeted information outlining not only what is known about the effects of drugs on driving behaviour, but also how long drugs can be detected in the system, may add to the deterrent effect of roadside testing. Information provision and increasing the transport options for young people are likely to play an important part in reducing the number of young clubbers who use drugs and drive.

1 INTRODUCTION

1.1 Ecstasy use in Australia

Ecstasy is a street term commonly used for tablets containing 3,4-methylendioxymethamphetamine (MDMA). MDMA is a stimulant with hallucinogenic properties. It produces such short-term effects as euphoria and a feeling of well-being, increased self-confidence, lack of inhibitions, sweating, inability to sleep and increased body temperature. Little is known about the long-term effects, however, at high doses these can include memory and cognition problems, depression and neurotoxicity (Degenhardt & Dunn, 2007). While ecstasy was originally synthesized in 1914, it has recently gained popularity within the nightclub and dance party scene.

According to the National Drug Strategy Household surveys, the proportion of the general population reporting lifetime use of ecstasy has risen steadily from 1.7% in 1995 to 7.5% in 2004 (Australian Institute of Health & Welfare, 2005). Similarly, an upward trend has been observed in the recent (past 12 month) use of ecstasy, increasing from 1% in 1995 to 3.4% in the 2004 survey (Australian Institute of Health & Welfare, 2005). Recent use was highest among the 14–19 year old (4.3%), and 20–29 year old (12%) age groups.

In reality, drugs sold and consumed as ecstasy could contain any combination of a number of substances that may or may not be related to MDMA. For the purposes of this report, the term ecstasy is used on the understanding that drugs consumed as 'ecstasy' may not be MDMA or even one of its analogues.

It is well documented that ecstasy users are typically polydrug users (Stafford et al., 2005; Dunn, Degenhardt & Stafford, 2006). The Ecstasy and related Drug Reporting System (EDRS), is a study that monitors ecstasy and related drug (ERD) markets across all states and territories of the country (Stafford et al., 2005). According to the 2005 NSW EDRS, ecstasy users were reported to have tried a mean of 11 drug classes, with 7 having been used in the preceding 6 months (Dunn, Degenhardt & Stafford, 2006). The main drugs recently

used were alcohol (75%), methamphetamine powder (speed; 58%), tobacco (55%) and cannabis (49%), with smaller proportions reporting having used cocaine (24%), ketamine (22%), crystal methamphetamine (21%) or GHB (5%).

Research has shown that ERD are mostly taken in the dance/nightclub environment where the stimulant and hallucinogenic effects are best appreciated (Degenhardt, Barker & Topp, 2004, Dunn, Degenhardt & Stafford 2006). The majority of these venues have limited opening hours and as some of the effects of ERD can last for a considerable amount of time it can be assumed that patrons may still be under the influence of drugs at closing time and as they head home. This is supported by the practice of post clubbing 'chill outs' or 'recoveries', where groups of friends/clubbers congregate at a designated person's home once a venue closes. Softer 'chill out' music is played, often in conjunction with further drug taking (Mixmag, 1999). While the NSW EDRS found that the most typical locations used for taking ecstasy were nightclubs (78%), raves (62%) and private parties (56%), it is cause for concern that 15% of regular ecstasy users reported using the drug in cars (Dunn, Degenhardt & Stafford, 2006). While using ecstasy in a car does not equate to driving under the influence, the temptation to drive may be greater when using in such a situation.

1.2 Ecstasy use and its effects upon driving

While experimental studies of the acute effects of a single dose of MDMA on psychomotor performance and actual driving behaviour have suggested small improvements in certain aspects like tracking in compensatory tracking tasks, and weaving in an on-the-road driving task, other aspects of driving behaviour have been found to deteriorate (Lamers et al., 2003; Ramaekers et al., 2006). Specifically, participants were impaired in their ability to estimate the time it would take for their moving vehicle to impact with an obstacle up ahead (e.g. another car). Speed adaptations in an on-the-road car following task were also seen to deteriorate. Clearly, such impairments in driving following MDMA use are cause for concern.

As ecstasy users are typically polydrug users, a number of studies have examined the combined effect of MDMA and other drugs on driving. In a quasi-controlled, naturalistic study, Brookhuis, de Waard and Samyn (2004) assessed the acute effects of MDMA and

polydrug use on simulated driving behaviour among MDMA users before and after a rave party. The most striking finding was an apparent decreased sense for risk-taking, both after MDMA and after polydrug use, as indicated by the acceptance of smaller gaps between cars. Hernandez-Lopez and colleagues (2002) investigated the combined effect MDMA and alcohol had on performance in a controlled experimental setting. The study revealed a discrepancy between subjective measures of sedation and objective measures of psychomotor impairment. MDMA tempered the subjective experience of alcohol-induced sedation, but did not counteract the alcohol-induced impairments on objective measures of psychomotor performance. Kuypers, Samyn and Ramaekers(2006) examined the effects of MDMA and alcohol, combined and alone, on actual driving performance and laboratory tasks related to driving. Actual driving performance was found to be affected by alcohol, MDMA, and the combination of both substances. Importantly, alcohol induced impairments of car-following and laboratory task performance were not overcome by the use of MDMA.

Given the known side effects of ERD, particularly their perception and cognition altering effects (often regarded as positive by users of these drugs), it is likely that they constitute a danger where driving is concerned, particularly during the initial intoxication period. The stimulant effects of some ERD can lead to heightened alertness and confidence, and this may in turn lull users into a false sense of security regarding their actual levels of impairment. Some may believe they are in control and able to drive a motor vehicle after a night of drug taking. This confidence, and the fact that they may not have drunk alcohol, are all factors that are taken into consideration when making the decision to drive (Akram and Forsyth, 2000).

1.3 Methamphetamine use in Australia

Methamphetamine is the most commonly used illicit drug after cannabis, with approximately one in ten Australians aged 14 years and over (9.1%) having tried methamphetamine, and 3.2% having done so in the past 12 months (Australian Institute of Health & Welfare, 2005). Statistics on the overall prevalence of methamphetamine in the general community mask the worryingly high prevalence among young adults in Australia. Among those aged 20-29, one in five (21.1%) have used methamphetamine in their lifetime, and 10.7% have taken the drug

recently. Most of these people who take the drug do so infrequently (e.g. 89% use monthly or less often). Methamphetamine use is not uncommon among night-club attendees, with a Victorian study reporting that 63% of participants had ever used methamphetamine powder, and 13% had done so in the month preceding interview (Degenhardt, Barker & Topp, 2006). Patterns of methamphetamine use in the community vary from infrequent snorting or swallowing of the drug, which is typical of younger novice or occasional users of the drug, through to daily injection of methamphetamine. (McKetin, 2007).

1.4 Methamphetamine use and its effects upon driving

While there is limited research available on the effects of methamphetamine on actual driving behaviour, experimental studies suggest that low doses of amphetamine have few effects on cognitive functioning, and may even result in an enhancement of some driving-related psychomotor tasks (Hurst, 1987; European Monitoring Centre for Drugs and Drug Addiction, 1999). Higher doses, however, appear to increase risk-taking and result in inappropriate and dangerous driving behaviour, such as speeding and carelessness (Albery Gossop & Strung, 1998; European Monitoring Centre for Drugs and Drug Addiction, 1999). The period following methamphetamine intoxication, when the effect is diminishing, is also hazardous, being associated with fatigue, anxiety, irritability and microsleeps (Logan, 1996). Clearly, such conditions would not be conducive to safe driving.

In a study examining the effects of dexamphetamine on simulated driving performance, a decrease in driving ability was observed, which the authors attributed to the perceptual narrowing or tunnel vision that is associated with dexamphetamine consumption (Silber et al., 2005). Tunnel vision typically occurs when an individual experiences emotional arousal, and perceived cues are progressively restricted to the focal point (Mills et al., 2001). Perceptual narrowing of this kind increases the risk of failing to attend to potential hazards when an emergency arises during driving. Importantly, Mills and colleagues (2001) report that tunneling is not augmented by dextroamphetamine after sleep loss. This has implications for stimulant users who believe that these drugs over-ride sleep deprivation, and enhance their ability to drive.

1.5 Cannabis use in Australia

According to the 2004 National Household Survey (Australian Institute of Health and Welfare, 2005), around one-third (33.6%) of Australians aged 14 years and over reported that they had used cannabis at some point in their lives. This proportion has remained relatively stable since 1993, but was marginally higher in 1998. Cannabis use in Australia is most prevalent among young adults aged 20–39 years. In 2004, more than one in two young adults (54.5%) and one in four adolescents (25.5%) reported using cannabis at least once in their life. Adolescents aged 14–19 years are now more likely to have ever tried cannabis (25.5%) than tobacco (16.2%). Cannabis use is common among night-club attendees, with the Victorian study cited above reporting that 72% of participants had ever used cannabis, and 45% had done so in the month preceding interview (Degenhardt et al., 2006).

1.6 Cannabis use and its effects upon driving

There is reasonable evidence from studies of cannabinoid levels in accident victims, and the few epidemiological studies that have been conducted, to suggest that driving after using cannabis probably increases the risk of motor vehicle accidents (Hall, Degenhardt & Lynskey, 2001). An Australian study of 1,045 fatalities (Drummer, 1994, 1998) found cannabinoids in the blood of 11% of drivers, 35% of whom also had blood alcohol concentrations indicative of intoxicating doses of alcohol. Gieringer (1988) in his study, estimated the proportion of drivers who might be expected to have blood and urine samples positive for cannabinoids from US household surveys. He estimated that cannabis users were 2 to 4 times more likely to be accident victims than non-cannabis users. Cannabis users who also used alcohol were even more likely to be over-represented among the victims of motor vehicle accidents (Gieringer, 1988). Two surveys of self-reported accidents among adolescent drug users found a relationship between self-reported cannabis use and involvement in accidents. Cannabis users were approximately twice as likely to report being involved in accidents than non-cannabis smokers (Hingson et al., 1982; Smart & Feyer, 1976).

Simulated driving tests have shown impairments of lane control after cannabis use (Smiley, 1999). Some studies, however, have shown reductions in risk-taking as manifested in slower speeds, and maintenance of a larger distance from the car in front in following tasks (Smiley, 1999). A series of on road studies by Robbe and O'Hanlon (1993) and Robbe (1994) found modest impairment of driving skills after cannabis on actual driving on either a driving course without traffic, on a highway or in urban traffic.

1.7 Drug driving among nightclub attendees

Both impaired driving and being a passenger of an impaired driver appear to be common occurrences among dance party attendants. A recent Australian study of 216 ecstasy users found about half of the sample (49%) admitted to having driven a motor vehicle shortly after ecstasy use, and half of this subgroup (49%) believed that the drug had a detrimental influence on driving ability (Gascoigne, Copeland & Dillon, 2004). A substantial minority felt that ecstasy had no influence on their ability to drive (38%), while the remainder (12%) felt that ecstasy increased their ability to drive. A small number of participants (3%) had actually experienced a road accident shortly after ecstasy use, where they were the driver at fault.

In a recent study of nightclub attendees in Victoria (Degenhardt et al., 2006) it was found that around one in ten participants reported that on the night of the interview they would either drive under the influence or be driven by someone under the influence of alcohol (10%), cannabis (11%), and/or methamphetamine (8%). While high proportions of the sample perceived driving under the influence of heroin (71%) and alcohol (59%) to be 'very dangerous', just under half thought that driving under the influence of crystal methamphetamine (48%), cocaine (46%) or ecstasy (44%) was very dangerous, with 39% viewing speed as very dangerous. A smaller proportion (36%) perceived driving under the influence of cannabis in this way.

In a study of rave attendees in Perth, 80% reported having recently driven to or having been driven by another person to a rave (Lenton & Davidson, 1999). Of these people, 45% reported that the driver had not been under the influence of a drug, 30% reported that the

driver had used a drug but was 'okay' and 12% reported that the driver was definitely under the influence of a drug. Twelve percent of respondents reported having taken drugs in the car on the way to the rave they last attended. Eighty-seven percent of those who reported driving or being driven home from their last rave stated that the driver had used some kind of intoxicant that night. Thirty-five percent of these respondents stated that the driver was still under the influence of drugs and/or alcohol, or was so tired they were falling asleep at the wheel.

Impaired driving was also common amongst people attending discos in Germany (Vollrath & Widera, 2000). Researchers surveyed drivers as well as obtaining blood, urine or breath samples. Alcohol was prevalent amongst this population, detected in 30% of people driving that night. Illicit drugs were also common, with some form of drug (other than alcohol) detected in 13% of people driving that night.

In research designed to inform the Scottish Road Safety Campaign on appropriate future publicity initiatives, qualitative studies involving attendees at nightclubs and dance events were conducted (Neale, McKeganey & Hay, 2001). Drug driving was found to be commonplace amongst those attending dance/nightclubs. Of those interviewed, 85% reported ever driving after recreational drug use and 31% said that they did so on at least a weekly basis. In relation to driving after ecstasy, interviewees often reported negative experiences such as blurred vision, impaired concentration, propensity to speed and slower reaction times. Although no individual felt that amphetamine consumption had had a beneficial effect on their driving, some felt that their driving was little affected while others were convinced that their driving had been impaired. Whilst the effects of driving after cocaine were described as mixed, driving after LSD was universally considered extremely dangerous (Neale, McKeganey & Hay., 2001). The majority of interviewed clubbers (87%) had been the passenger of somebody who had taken illicit drugs, and 31% said that this occurred on a monthly basis (Neal, McKeganey & Hay., 2001). Some of the reasons given for accepting a lift with a drug-driver (despite sometimes being afraid to do so) included the cost and limited availability of alternative transport at the time and trusting others' judgement about their ability to drive.

1.8 Law enforcement responses

Random breath testing (RBT) was first introduced in Australia in 1982, with the primary policy focus being prevention rather than detection in the control of drink driving (Moloney, 1994). That is, the introduction of RBT was intended to be a deterrence measure and contrasted sharply with the earlier and traditional enforcement approach emphasising apprehension and punishment (Homel, 1993). The aim was to produce a highly visible and broadly based enforcement procedure that would deter the community, and more specifically the potential offender, from driving after drinking, based on the possibility of being caught (Homel, 1993). Research evidence supports the concept of deterrence in that individuals who have had recent exposure to RBT, and believe there is a high probability of being caught, are less likely to decide to drink and drive (Harrison, 1996). Crash data from New South Wales over a 4-year period after the introduction of RBT showed a 36% decrease in alcohol-related fatalities and serious injuries compared to pre-RBT levels (Homel, 1993). Queensland experienced similar results with alcohol-related fatalities falling by 29% during the 5 years after the introduction of the program (Watson, Fraine & Mitchell, 1995).

Increasingly, however, accidents and driving fatalities involve drug use. Drugs other than alcohol have been detected in approximately 23% of heavy vehicle drivers killed in crashes (Swann, 2004). In 2001, sixteen point five percent of driver fatalities involved the use of cannabis (THC) or stimulant/amphetamine type drugs, whilst in 2002 this figure had risen to 20.4% of driver fatalities (Swann, 2004). While alcohol still appears to be the main drug implicated in driver deaths in Australia, a small but notable proportion of deaths involve stimulant drugs. Drummer and colleagues (2003) examined the incidence of alcohol and drugs in fatally injured drivers (n=3,398) in three states (Victoria, New South Wales and Western Australia) for the period of 1990 to 1999. Alcohol at, or above, 0.05 g/100 ml was present in 29.1% of all drivers, and stimulants in 4.1%. Stimulants consisted mainly of methamphetamine (n=51), MDMA (n=6), cocaine (n=5) and the ephedrines (n=61). These findings highlight the need for public health strategies designed to reduce drug driving.

In response to concerns about the occurrence of illicit drug use among drivers, the New South Wales Government passed the *Road Transport Legislation Amendment (Drug Testing) Act*

2006, which commenced on 13 December 2006. This legislation allows for random roadside drug testing (RDT) and the compulsory drug testing of any driver, motorcycle rider or supervising licensing holder involved in a fatal crash. This was to be completed by means of a saliva test for three illicit drugs: active THC (the main active ingredient of cannabis), methylamphetamine (a drug variously sold as 'speed' methamphetamine powder, 'base' methamphetamine or 'crystal' methamphetamine), and methylenedioxymethylamphetamine (MDMA, also known as ecstasy). The introduction of this legislation in NSW is in keeping with a similar trend to do so across most Australian jurisdictions.

Following drug use, the period of time during which drug detection in saliva is possible varies, and may be influenced by factors such as the amount and potency of the drug used. According to Cirimele and colleagues (2006), several recent studies testing for the presence of THC in oral fluid had detection times ranging from 2–10 hours. Roadside drug testing technology will also detect recent usage of methamphetamine (speed/ice/base) and ecstasy. In some cases methamphetamine can be detected more than 24 hours after use, though the exact time will vary depending, for example, on the amount taken, the potency of the drug (e.g. ice has a higher potency than speed) and route of administration (Huestis & Cone, 2007).

While legislation allows for random testing, it is likely that New South Wales Police activity will be intelligence driven, targeting drug screening at locations where high-risk drivers are likely to present, in order maximize the potential benefit and efficiency of the legislation.

In anticipation of the introduction of roadside saliva testing in New South Wales, this study was conducted in November 2006 to examine the prevalence of illicit drug use among nightclub attendees in Sydney, NSW; their transport methods; and their histories of drug use and driving. A subsidiary aim of this study was to establish a 'baseline' against which future studies might be able to compare drug use and driving behaviour after the introduction of testing.

1.9 Aims

The aims of the current study were, therefore, to do the following:

1. document the demographics and drug use history of nightclub attendees prior to the introduction of roadside drug testing in Sydney;

2. document the reported ways in which nightclub attendees reported travelling to and from nightclubs;

3. examine nightclub attendees' drug driving behaviour and their risk perception of the effects of different drugs upon driving ability; and

4. document the knowledge of roadside drug testing prior to its introduction by the NSW Government.

2. METHOD

2.1 Questionnaire

A short questionnaire was developed for use in the current study (see Appendix A). It was designed to be brief, easily administered within the club setting, and allow participants to self-complete the drug use and driving sections (to enhance valid reports of drug use and driving under the influence).

2.2 Sample and procedure

The questionnaire was administered in two inner-city venues, Sydney, NSW. Attempts were made to recruit a number of different venues in different areas of Sydney; however, many venues were reluctant to become involved. Two inner-city dance venues agreed to participate and recruitment at these venues took place over two weekends in November 2006.

Data were collected between the hours of 10p.m. and 3a.m. at the two venues. At each venue data was collected over two weeks. Interviews were conducted on a Thursday and a Saturday night at one venue, and on Friday nights at the other venue. Relatively quiet areas, in a discrete setting were selected by interviewers in order to administer the interview to participants. Research assistants approached venue attendees and asked if they would like to participate in the study. If the person was interested, the research assistant explained the study in more detail, and written informed consent was obtained. Participants self-completed the survey which took approximately 10 minutes. Research assistants checked over the survey upon completion, to ensure the participant had completed the survey correctly. Upon completion of the survey, participants were offered a voucher for a bottle of still water; an incentive that proved to be very successful. Research assistants encountered few difficulties in terms of venue and recruitment, and refusal rates were extremely low (< 5%) at each of the venues.

2.3 Interviewers

Interviewers included one academic staff member and three research officers from the National Drug and Alcohol Research Centre, and two casual interviewers employed by the centre. All interviewers had previous interviewing experience and a psychology background. Appropriate training and debriefing was provided for each of the interviewers. Participants were provided with a participant information sheet and had the study explained to them by one of the interviewers, enabling them to provide informed consent for participation in the study. Research participants were also furnished with information detailing where they could find out more about the project if they desired. A group of three to four research officers were present at each venue on each data collection episode.

3 RESULTS

3.1 Demographics and drug use history of the sample

In total, 419 persons were interviewed for the study. Three-quarters of the sample were male (75%), with an average age of 23.5 years (Table 1). Most were single (79%), with 17% reporting that they were currently married or in a defacto relationship. Close to three-quarters of the sample (74%) reported that they had completed high school.

Table 1: Demographic characteristics of the sample

Mean age (years; range)	23.5 (18–44)
Male (%)	75
Marital status	
% single	79
% married/defacto	17
% divorced/separated	3
Completed high school (%)	74

Consistent with research among regular ecstasy users in Sydney (Dunn, Degenhardt & Stafford, 2006), high rates of lifetime use of a range drugs were reported (Table 2). Alcohol use was almost universal (90%). Over two-thirds of the sample reported having used ecstasy (71%), with more than half reporting the use of cannabis (57%), or methamphetamine powder ('speed', 56%) at some point. Notable proportions reported crystal or ice methamphetamine use (32%) and cocaine use (44%).

Recent (past month) drug use was also quite high (Table 2). Eight in ten reported past month alcohol use (81%). Just under half of the sample reported having used ecstasy (48%), one-third reported cannabis use (32%), over a quarter had used methamphetamine powder

(28%), and approximately a fifth (19%) reported cocaine use. Recent crystal or ice methamphetamine use was reported by 15%.

The most commonly reported drugs used on the last clubbing occasion were alcohol (71%), ecstasy (47%), methamphetamine powder (24%), and cannabis (15%).

Table 2: Drug use history of the sample

	% ever[1]	% past month[1]	% on last clubbing occasion[1]
Alcohol	90	81	71
Ecstasy	71	48	47
Cannabis	57	32	15
Methamphetamine powder (Speed)	56	28	24
Crystal, ice, base methamphetamine	32	15	10
Cocaine	44	19	11
Heroin	5	1	2

[1]Percentages refer to those who commented

3.2 Driving and drug use

More than nine in ten (94%) participants reported that they had ever driven a vehicle, 84% had ever had a drivers licence (excluding learners permits), and 82% had a current licence. One in five (21%) reported having driven without a valid licence within the past year. Almost half of the sample reported having had an accident while driving (45%). When asked whether any of these accidents occurred after having taken drugs or alcohol, 32% chose not to respond. Of those who did respond (n=127), 61% indicated no drugs had been taken, 15% had used alcohol, 15% had used illicit drugs and 9% had used both alcohol and illicit drugs.

Driving on the last clubbing occasion

Not counting the night of interview, the last clubbing occasion for participants was reported to be a median of 7 days prior (range: 1–400 days). Participants most commonly reported driving themselves (28%), getting a lift with someone (22%), or using public transport (17%) to get to the venue (Table 3). Similarly the most common means of getting home on the last clubbing occasion were driving themselves (27%), being driven by someone else (21%) or taking a taxi (24%).

Table 3: Participants' modes of transport to and from nightclub venues

	% to venue	% from venue
Drove self	28	27
Driven by another	22	21
Public transport	17	12
Taxi	16	24
Walking	16	14
Other	< 1	3

Half of the sample (52%) reported having driven under the influence of alcohol or other drugs at some point in their lives. The most commonly reported drugs were alcohol (42%), ecstasy (38%), cannabis (31%) and methamphetamine powder (30%). Almost one in five reported having driven under the influence of cocaine (18%) or crystal methamphetamine (17%, Table 4).

In the past month, participants most commonly reported having driven under the influence of ecstasy (19%), alcohol (15%), methamphetamine powder (11%) or cannabis (11%), with a similar pattern reported for the last clubbing occasion. The usual delay between use and driving was reported to be a median of an hour or less for stimulants such as crystal methamphetamine, methamphetamine powder or cocaine (Table 4), and longer periods for alcohol (median=3 hours) and ecstasy (median= 2 hours).

Table 4: Driving under the influence of drugs

	% ever[1]	% past month[1]	% on last clubbing occasion[1]	Median hours between use and driving (range)[2]
Alcohol	42	15	9	3.0 (r: 0–10)
Cannabis	31	11	5	0.75 (r: 0–24)
Ecstasy	38	19	15	2.0 (r: 0–24)
Methamphetamine powder (speed)	30	11	9	0.5 (r: 0-24)
Crystal, ice, base methamphetamine	17	6	4	1.0 (r: 0–48)
Cocaine	18	6	4	0.5 (r: 0–24)
Heroin	4	1	1	0 (r: 0–10)

[1]Percentages refer to those who commented.

[2]Excludes those who had never driven under the influence.

Almost three-quarters (73%) reported having been driven by someone under the influence of a drug. Table 5 shows that the reported lifetime rates of being driven by another person who was under the influence of drugs were also high, with approximately two-thirds having been driven by someone under the influence of alcohol (63%), and over half reporting that someone had driven them under the influence of ecstasy (56%) or cannabis (54%). Almost half reported having been the passenger of someone under the influence of

methamphetamine powder (47%) and close to one in three had been driven by someone under the influence of crystal methamphetamine (30%) or cocaine (31%).

While past month rates were lower, notable proportions reported that they had been driven by someone under the influence of ecstasy (29%), alcohol (24%), cannabis (21%), or methamphetamine powder (20%) in the past month. Participants also commonly reported having been driven by someone under the influence of these drugs on the last clubbing occasion (Table 5).

Table 5: Experience of being a passenger of a driver under the influence of drugs

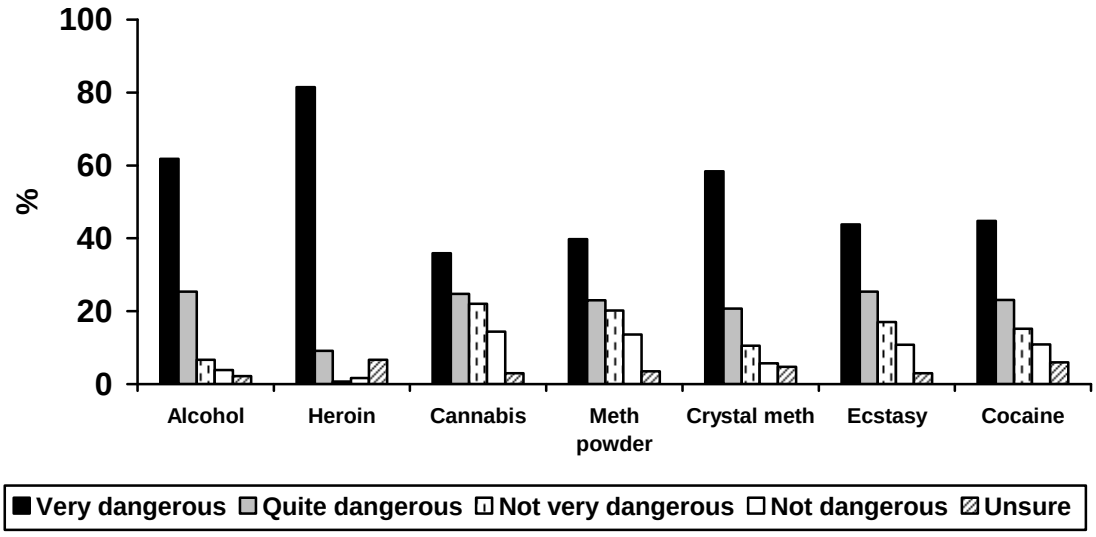
	% ever[1]	% past month[1]	% on last clubbing occasion[1]
Alcohol	63	24	15
Cannabis	54	21	12
Ecstasy	56	29	22
Methamphetamine powder (speed)	47	20	14
Crystal, ice, base methamphetamine	30	11	8
Cocaine	31	11	7
Heroin	7	2	2

[1]Percentages refer to those who commented

3.3 Risk perception

Figure 1 presents the perceived risks of driving under the influence of a range of drug types. High proportions of the sample perceived that driving under the influence of heroin (82%), alcohol (62%) or crystal methamphetamine (58%) was 'very dangerous'. Just under half of the sample thought that driving under the influence of cocaine (45%) or ecstasy (44%) was very dangerous, with 40% viewing speed as very dangerous. A smaller proportion – approximately one in three of the sample (36%) – viewed driving under the influence of cannabis in this way.

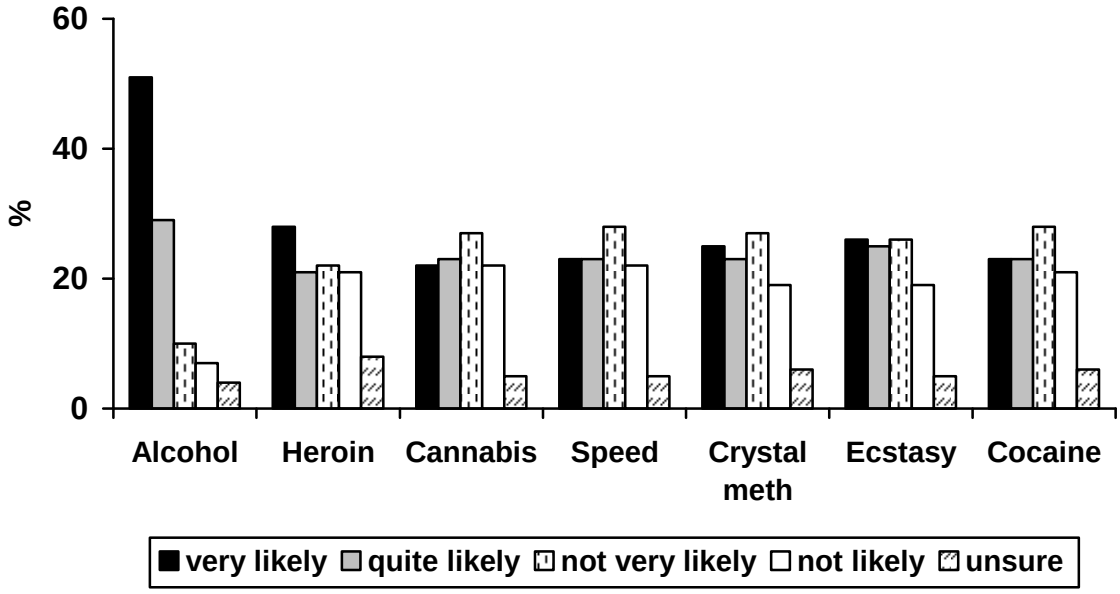
Figure 1: Participants' perceptions of risk associated with driving under the influence of drugs



Perhaps not surprisingly, given that random roadside testing for alcohol is well-established in New South Wales, the drug for which participants thought there was the highest risk of detection if driving under the influence on the night of the interview was alcohol: with large proportions reporting that it was very likely (51%) or quite likely (29%) that an individual would be detected if driving under the influence (Figure 2). Participants were more likely to report that it was 'not very likely' or 'not likely' that someone would be caught that night if driving under the influence of stimulant drugs, such as speed (50%), crystal methamphetamine (46%), ecstasy (45%) or cocaine (49%). Just over half of the sample

reported that they thought it was not likely or not very likely that persons driving under the influence of cannabis on the night of interview would be caught (50%).

Figure 2: Participants' perceptions of risk of being caught under the influence of drugs if driving home on the night of interview



3.4 Roadside drug testing

The vast majority of participants (85%) reported that they had heard of roadside drug testing (Table 6). Large proportions of participants correctly thought that the test would detect the use of ecstasy (86%), methamphetamine powder (78%), crystal methamphetamine (62%) and cannabis (78%). There was some error in the drugs that participants thought could be detected by the test, with around three in five reporting it could detect cocaine (61%) and two in five reporting that the test could also detect heroin (40%). All participants were asked if roadside drug testing would change their clubbing and driving behaviour (Table 6). Thirty-five percent reported that it would change their behaviour: 8% reported that they wouldn't use drugs if planning to drive, 6% reported that they would wait 2-3 hours before driving after taking drugs, and 18% reported that they would not drive if they were clubbing. Of the 18% who would not drive if taking drugs, 46% reported they would catch a taxi, 39% reported that they would catch public transport and 14% would get someone else to drive

them. Importantly, almost half (46%) of those with a history of drug driving (excluding alcohol) indicated that the test would change their clubbing and driving behaviour.

Table 6: Understanding of roadside drug testing and its effects upon nightclub attendees' intentions to drive

% who had heard of the test	85
% reporting the test could detect…	
alcohol	67
heroin	40
ecstasy (MDMA)	86
methamphetamine powder	78
crystal methamphetamine ('ice')	62
ritalin	30
cannabis	78
cocaine	61
% reporting the test would change their clubbing and driving behaviour…and they would….	35
wait 2-3 hours before driving	*6*
not drive if they were clubbing	*18*
not use drugs if clubbing and planning to drive	*8*
other	*2*
Not specified	*1*
% of those with a history of drug driving (excluding alcohol) who reported the test would change their clubbing and driving behaviour	46

4 DISCUSSION

The participants interviewed for this study were typically male, young adults who were usually single. Most had completed secondary education. While the majority of this sample had a current drivers licence (82%), a fifth had driven without a valid licence in the past year. It is well documented that young people aged 1724 years are usually over-represented in motor vehicle accidents (Motor Accidents Authority of NSW, 2006), and in keeping with this almost half of the current sample reported having had an accident while driving. It is unclear how this compares to the prevalence of accidents among young people in the general community. The most commonly reported methods of getting to the venue on the last clubbing occasion were either being driven (22%) or driving themselves (28%). Similar proportions reported having used these methods when leaving the venue on the last occasion.

Consistent with other research among regular ecstasy users in Sydney (Dunn, Degenhardt & Stafford, 2006), the persons interviewed in the current study reported relatively high rates of licit and illicit drug use in their lifetime, as well as recently. On the last clubbing occasion almost two-thirds had used alcohol, close to half had used ecstasy, and a quarter methamphetamine powder.

As found in a recent Victorian study of nightclub attendees (Degenhardt et al., 2006), notable proportions reported that they had driven under the influence of a range of licit and illicit drugs at some point in their lives, with significant minorities reporting that they had done so within the past month. These findings suggest that a significant proportion of nightclub attendees in Sydney are likely to place themselves and others at risk when driving under the influence of alcohol and illicit drugs, thus highlighting the need for harm reduction strategies such as RDT.

The usual delay between drug use and driving was a median of two hours for ecstasy, and less than one hour for stimulants such as crystal methamphetamine, methamphetamine powder or cocaine. Such delays are likely to be insufficient to avoid detection in a roadside drug test. It appears that young drivers are in need of further education about their risk of

detection following use. Many are unlikely to realize, for instance, that in some cases psychostimulants can be detected by roadside testing more than 24 hours after use (Huestis & Cone, 2007). Such knowledge may be useful in modifying the behaviour of nightclub attendees, potentially encouraging them to use alternative modes of transport when travelling to and from nightclub venues. Targeted campaigns outlining not only the effects of drugs on driving behaviour, but also how long the drug can impair driving may add to the deterrent effect of the roadside drug testing.

Perhaps due to the earlier introduction of roadside testing in Victoria, the vast majority of participants reported having heard of roadside drug testing. Importantly, over a third of the sample reported that they would consider changing their clubbing and driving behaviour with the introduction of roadside drug testing. This represents almost half of those who had ever driven under the influence of drugs other than alcohol. It is important to remember that for most of those who reported that their behaviour would change, it did not mean that their drug use patterns would be altered. Most (18%) reported that they would not drive, and 6% would simply wait two to three hours before driving after they had consumed drugs. Nonetheless, a notable minority (8%) would not use drugs if driving. These responses are suggestive of potential reductions in drug driving behaviour among a sample of persons likely to be otherwise placing themselves and others at risk.

One of the lessons learned from the introduction of random breath testing (RBT) in Australia was that to be effective the enforcement campaign needed to be highly visible, conducted as often as possible, rigorously enforced so as to ensure credibility, and well publicised (Homel, Caseldine & Kearns, 1988). RBT relies heavily on creating a perception amongst the driving public that if they drink then drive, their apprehension is inevitable. It is not unreasonable to hypothesise that nightclub attendees are also more likely to change their drug driving behaviour if they perceive their likelihood of being apprehended for drug driving as high. As indicated earlier, it is likely that the New South Wales Police activity will be intelligence driven, targeting drug screening at locations where high-risk drivers are likely to present.

Previous research has shown that two of the reasons offered for driving after using drugs include the cost and limited availability of alternative transport options. While over a third of the sample reported that they would change their drug driving behaviour if roadside drug testing were introduced, organising another driver, using a taxi or another form of public transport, all depend upon availability and cost. Most nightclub areas are in the inner cities and public transport is limited at best in the early hours of the morning and can be extremely expensive. These limit the options that young clubbers have at their disposal, and may explain why so many drive after taking drugs, or are driven by others who make that choice. A roadside drug testing operation that was supported by an increase in transport options for young people traveling to and from nightclub venues, would be likely to maximize the deterrent effect of RDT.

4.1 Conclusions

The findings of the current study suggest that the introduction of roadside drug testing in New South Wales may have positive impacts upon drug use and driving risk behaviours among a sample of young persons attending nightclubs. Importantly, almost half of those who reported a drug driving history indicated that the test would change their clubbing behaviour, highlighting the potential of RDT to be an effective prevention strategy with favourable public health implications. The success of RDT operations amongst young clubbers will be dependent on ensuring that testing is just part of an overall program. Information provision, and increasing the transport options for young people, will also play a part in reducing the number of young clubbers who use drugs and drive.

REFERENCES

Australian Institute of Health & Welfare (2005). 2004 National Drug Strategy Household Survey. Australian Institute of Health and Welfare, Canberra.

Akram, G. & Forsyth, A. J. M. (2000). Speed freaks? A literature review detailing the nature and prevalence of dance drugs and driving. *International Journal of Drug Policy, 11,* 265-77.

Albery, I., Gossop, M. & Strang, J. (1998). Drivers who use illicit drugs: behaviour and perceived risks. *Drugs: Education, Prevention and Policy, 7,* 39-50.

Brookhuis, K.A., de Waard, D. & Samyn, N. (2004). Effects of MDMA (ecstasy), and multiple drug use on (simulated) driving performance and traffic safety. *Psychopharmacology, 173,* 440-45.

Cavallo, A. & Drummond, A. (1994). Evaluation of the Victorian random breath testing initiative. In Proceedings of the Australasian Drink-Drive Conference, pp. 9-19.

Cirimele, V., Villain, M., Mura, P., Bernard, M. & Kintz, P. (2006). Oral fluid testing for cannabis: On-site OraLine IV s.a.t. device versus GC/MS. *Forensic Science International, 161,* 180-84.

Degenhardt, L., Barker, B. & Topp, L. (2004). Patterns of ecstasy use in Australia: Findings from a national household survey. *Addiction, 99,* 187-95.

Degenhardt, L., Dillon, P., Duff, C. & Ross, J. (2006). Driving, drug use behaviour, and risk perceptions of nightclub attendees in Victoria, Australia. *International Journal of Drug Policy, 17,* 41-46.

Degenhardt, L. & Dunn, M. (2007). Ecstasy. In J.Ross (Ed), Illicit drug use in Australia: Epidemiology, use patterns and associated harm. Second Edition. Australian Department of Health and Ageing, Canberra.

Drummer, O.H. (1994). Drugs in drivers killed in Australian road traffic accidents: the use of responsibility analysis to investigate the contribution of drugs to fatal accidents. Victorian Institute of Forensic Pathology, Melbourne.

Drummer, O.H. (1998). Involvement of drugs in accident causation. Federal Office of Road Safety, Canberra.

Drummer, O.H., Gerostamoulos, J., Batziris, H., Chu, M., Caplehorn, J.R.M., Robertson, M.D. & Swann, P. (2003). The incidence of drugs in drivers killed in Australian road traffic crashes. *Forensic Science International, 134,* 154-62.

Dunn, M., Degenhardt, L. & Stafford, J. (2006). NSW Trends in Ecstasy and Related Drug Markets 2005: Findings from the Party Drugs Initiative (PDI). NDARC Technical Report No. 249. National Drug and Alcohol Research Centre, University of New South Wales, Sydney.

European Monitoring Centre for Drugs and Drug Addiction (1999). Literature Review on The Relation between Drug Use, Impaired Driving and Traffic Accidents. EMCDDA, Lisbon.

Gascoigne, M., Copeland, J. & Dillon, P. (2004). Ecstasy and the concomitant use of pharmaceuticals. NDARC Technical Report No. 201. National Drug and Alcohol Research Centre , University of New South Wales, Sydney.

Gieringer, D.H. (1988). Marijuana, driving and accident safety. *Journal of Psychoactive Drugs, 20,* 93-101.

Hall, W., Degenhardt, L. & Lynskey, M. (2001). The health and psychological effects of cannabis use. National Drug Strategy Monograph Series No. 25. Commonwealth Department of Health and Aged Care, Canberra.

Harrison, W. A. (1996). An exploratory investigation of aspects of drink-driving and enforcement in rural areas of Victoria. Report No. 93. Monash University Accident Research Centre, Melbourne.

Hernandez-Lopez, C., Farre, M., Roset, P.N., Menoyo, E., Pizarro, N., Ortuno, J., Torrens, M, Cami, J. & de la Torre, R. (2002). 3,4-Methylenedioxymethamphetamine (ecstasy) and alcohol interactions in humans: psychomotor performance, subjective effects, and pharmacokinetics. *Jounal of Pharmacology and Experimental Therapeutics, 300,* 236-44.

Hingson, R., Heeren, T., Mangione, T., Morelock, S. & Mucatel, M. (1982). Teenage driving after using marijuana or drinking and traffic accident involvement. *Journal of Safety Research, 13,* 33-7.

Homel, R. (1993). Random breath testing in Australia: Getting it to work according to specifications. *Addiction, 88,* 27S-33S.

Homel, R., Caseldine, D. & Kearns, I. (1988). Drink driving Counter-Measures in Australia. *Alcohol Drugs and Driving, 4,* no 2.

Huestis, M.A. & Cone, E.J. (2007) Methamphetamine Disposition in oral fluid, plasma, and urine. *Annals of the New York Academy of Sciences, 1,098,* 104-21.

Hurst, P. M. (1987). Amphetamines and driving. *Alcohol, Drugs and Driving, 3,* 13-7.

Kuypers, K.P.C., Samyn, N. & Ramaekers, J.G. (2006). MDMA and alcohol effects, combined and alone, on objective and subjective measures of actual driving performance and psychomotor function. *Psychopharmacology, 187,* 467-75.

Lamers, C.T., Ramaekers, J.G., Muntjewerff, N.D., Sikkema, K.L., Samyn, N., Read, N.L., Broohuis, K.A. & Riedel, W.J. (2003). Dissociable effects of a single dose of ecstasy (MDMA) on psychomotor skills and attentional performance. *Journal of Psychopharmacology, 17,* 379-87.

Lenton, S. & Davidson, P. (1999). Raves, drugs, dealing and driving: Qualitative data from a West Australian sample. *Drug and Alcohol Review, 18,* 153-61.

Logan, B.K. (1996). Methamphetamine and driving impairment. *Journal of Forensic Sciences, 41,* 457-464.

McKetin, R. (2007). Methamphetamine. In J. Ross (Ed), Illicit drug use in Australia: Epidemiology, use patterns and associated harm. Second Edition. Australian Department of Health and Ageing, Canberra.

Mills, K.C., Spruill, S.E., Kanne, R.W., Parkman, K.M. & Zhang, Y. (2001). The influence of stimulants, sedatives, and fatigue on tunnel vision: risk factors for driving and piloting. *Human Factors, 43,* 310-27.

Mixmag (1999). Happy Sundays. *Mixmag, 96,* 69-73.

Moloney, M. (1994). Management of RBT operations in Victoria. In Proceedings of the Australasian Drink-Drive Conference, pp. 71-83.

Motor Accidents Authority of NSW. (2006). Motor Accidents Authority Annual Report 2005-2006. Sydney: Motor Accidents Authority of NSW, Sydney.

Neale, J., McKeganey, N. & Hay, G. (2001). Recreational drug use and driving: A qualitative study. The Scottish Executive Central Research Unit, Glasgow.

Ramaekers, J.G., Kuypers, K.P.C. & Samyn, N. (2006) Stimulant effects of 3,4-methylenedioxymethamphetamine (MDMA) 75 mg and methylphenidate 20 mg on actual driving during intoxication and withdrawal. *Addiction, 101,* 1614-21.

Roads and Traffic Authority (RTA) (2007). Drugs and driving. http://www.rta.nsw.gov.au

Robbe, H.W.J. & O'Hanlon, J. (1993). Marijuana's effect on actual driving: Summary of a 3-year experimental program. In H. Utzelmann, G. Berghaus, & G. Kroj. (Eds), Alcohol, drugs and traffic safety, pp. 603-11 (Verlag TUV Rheinland, Koln).

Robbe, H.W.J (1994). Influence of marijuana on driving. Institute for Human Psychopharmacology, University of Limberg, Maastricht.

Sheehan, M. (1994). Alcohol controls and drink-driving: The social context. FORS Monograph CR 142. Vol. 3, pp. 1-8. AGPS, Canberra.

Siegel, R. K. (1987). Cocaine use and driving behaviour. *Alcohol, Drugs and Driving, 3***,** 1-8.

Silber, B.Y., Papafotiou, K., Croft, R.J., Ogden, E., Swann, P. & Stough, C. (2005). The effects of dexamphetamine on simulated driving performance. *Psychopharmacology,179,* 536-43.

Smart, R. & Feyer, D. (1976). Drug use and driving among high school students. *Accident Analysis & Prevention, 8,* 33-8.

Smiley, A. (1999). Marijuana: On road and driving simulator studies. In H. Kalant, W. Corrigall, W. Hall. & R. Smart. (Eds), The health effects of cannabis, pp. 171-93. Addiction Research Foundation, Toronto.

Stafford, J., Degenhardt, L., Agaliotis, M., Chanteloup, F., Fischer, J., Matthews, A., Newman, J., Proudfoot, P., Stoove, M., & Weekley, J. (2005). Australian trends in ecstasy and related drug markets 2004: Findings from the Party Drugs Initiative. NDARC Monograph No. 57. National Drug and Alcohol Research Centre, University of New South Wales, Sydney.

Swann, P. (2004). Saliva testing for Illicit drugs: New drug legislation. TWU Victoria/Tasmania Branch, Melbourne.

Watson, B., Fraine, G. & Mitchell, L. (1995). Enhancing the effectiveness of RBT in Queensland. In School of Justice Administration (Ed), Prevention of alcohol related road crashes: social and legal approaches conference, pp. 31-49. Griffith University, Brisbane.

Vollrath, M. and Widera, T. (2000). Alcohol and illegal drug use while driving by recreational drug users in Germany. In International Conference on Alcohol, Drugs and Traffic Safety Stockholm.

APPENDIX A: QUESTIONNAIRE