

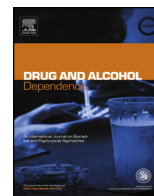


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# Driving under the influence among frequent ecstasy consumers in Australia: Trends over time and the role of risk perceptions

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### ABSTRACT

**Background:** Driving under the influence (DUI) of alcohol and illicit drugs is a serious road safety concern. This research aimed to examine trends in DUI across time and changes in attitudes towards the risks (crash and legal) associated with DUI among regular ecstasy users (REU) interviewed in Australia.

**Methods:** Participants were regular (at least monthly) ecstasy users surveyed in 2007 ( $n = 573$ ) or 2011 ( $n = 429$ ) who had driven a car in the last six months. Face to face interviews comprised questions about recent engagement of DUI and roadside breath (alcohol) and saliva (drug) testing. Participants also reported the risk of crash and of being apprehended by police if DUI of alcohol, cannabis, ecstasy, and methamphetamine.

**Results:** There were significant reductions in DUI of psychostimulants (ecstasy, methamphetamine, cocaine, LSD) but not alcohol or cannabis between 2007 and 2011. This was accompanied by increased experience of roadside saliva testing and increases in crash and legal risk perceptions for ecstasy and methamphetamine, but not alcohol or cannabis. When the relationship between DUI and risk variables was examined, low crash risk perceptions were associated with DUI of all substances and low legal risk perceptions were associated with DUI of ecstasy.

**Conclusions:** The observed reduction in DUI of psychostimulants among frequent ecstasy consumers may be related to increased risk awareness stemming from educational campaigns and the introduction of saliva testing on Australian roads. Such countermeasures may be less effective in relation to deterring or changing attitudes towards DUI of cannabis and alcohol among this group.

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## 1. Introduction

The findings from both experimental and epidemiological research suggest that driving under the influence (DUI) of alcohol and drugs is a serious road safety concern (EMCDDA, 2014; Kelly et al., 2004). Alcohol has long been known to produce dose-dependent effects on a range of cognitive abilities that are important to driving, and has consistently been identified as a major factor in crash risk and culpability (Kelly et al., 2004). The effects of specific illicit drugs on driving-related cognitive processes are less clear, with some drugs affecting different cognitive processes to varying degrees, and with some stimulant drugs (e.g., MDMA, amphetamines, cocaine) improving performance on some discrete cognitive tasks in the laboratory (EMCDDA, 2014). Epidemiological data is similarly unclear: a recent review suggests a small but

statistically significant increase in crash risk and culpability for amphetamines, cannabis, heroin and cocaine (EMCDDA, 2014). This risk is substantially increased when other drugs are combined with alcohol (EMCDDA, 2014). Despite the variability of research findings in relation to specific illicit drugs, there is enough evidence to suggest that DUI of illicit drugs is an unsafe driving practice, particularly when combined with alcohol and effects related to drug use practices such as sleep deprivation.

DUI of alcohol has long been the target of policy measures and intervention strategies, and roadside breath testing has been implemented in all Australian states for over 20 years (Homel, 1990). The introduction of 'random' breath testing (RBT) in Australia (and in other countries) has been associated with a significant decline in alcohol-related crashes and associated injuries and fatalities (Henstridge et al., 1997; Peek-Asa, 1999). However, DUI of alcohol is still a major concern with regard to road safety. In a recent national survey, around one-tenth (13.1%) of recent drinkers in the general Australian population reported driving a vehicle while under the influence of alcohol in 2010 (AIHW, 2011).

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DUI of illicit drugs has more recently become the target of policy countermeasures such as roadside saliva testing. There are a range of issues associated with roadside saliva testing for illicit drugs including the ability to determine whether the presence of particular illicit drug equates to impaired driving, and the determination of appropriate cut-offs to establish current influence and/or probable impairment (for reviews see Lenné, 2007; Pil and Verstraete, 2008; Walsh et al., 2004). These issues are compounded by the illegal nature of the substances in question. In a world first, roadside drug testing was first introduced in the Australian state of Victoria in December 2004, and was subsequently implemented in Tasmania (July, 2005), South Australia (July, 2006), New South Wales (December, 2006), Western Australia (October, 2007), Queensland (December, 2007), the Northern Territory (July, 2008) and the Australian Capital Territory (May, 2011). In all states, roadside drug testing legislation allows for oral fluid testing for methamphetamine, THC (the active constituent in cannabis), and MDMA ('ecstasy'). The introduction of roadside saliva testing has typically been coupled with educational and informational interventions largely through mass media campaigns. However, the targeted messages and implementation strategies have differed markedly in each Australian state and territory, with some focusing on crash risk and others on the effects of specific drugs or the risk of apprehension by police (NDLRF, 2011).

At a population level, there has been a significant decline in reports of DUI of illicit drugs among past-year consumers between 2007 (20.9%) and 2010 (18.0%) (AIHW, 2008, 2011). While there is little empirical research to investigate the specific impact of the introduction of roadside saliva testing and associated media campaigns, it is possible that the decline in DUI of illicit drugs at a population level is related to the introduction of such countermeasures. In relation to alcohol, such community-level countermeasures have been demonstrated to be less effective at changing behaviours among high-risk groups than among low-risk groups (Terer and Brown, 2014). As such, it is of particular interest to examine trends in DUI and attitudes among high frequency drug consumers, who represent a particularly high risk group.

Cross-sectional samples of recreational drug users demonstrate higher rates of DUI relative to general population surveys (Duff and Rowland, 2006; Terry and Wright, 2005). In the Australian context, ecstasy is the most commonly used illicit drug after cannabis (AIHW, 2011), and frequent ecstasy consumers represent a particularly high risk group for DUI of multiple substances, given their high levels of polysubstance use (Sindicich and Burns, 2012). For example, among a sample of Australians who regularly consumed ecstasy, almost one-half reported recent DUI of ecstasy (Matthews et al., 2008). In addition, within this sample, almost one-half of current consumers of cannabis and methamphetamine and two-fifths of current alcohol consumers reported DUI of these substances in the preceding six months. Frequency of use for each substance was found to have the largest association with DUI engagement. Crash risk perceptions were also found to play a role, with low risk perceptions associated with DUI, particularly for ecstasy.

Given the introduction and expansion of roadside drug testing and associated media campaigns in Australia over the last decade, it is of interest to examine changes in DUI and attitudes towards risk over time among groups of illicit drug consumers who are at high risk of engaging in these behaviours. Thus, the aim of this research was to examine trends in DUI of alcohol and illicit drugs among two samples of regular ecstasy users (REU) interviewed in 2007 and 2011. A further aim was to examine changes in attitudes towards DUI (crash risk and risk of apprehension) during this time, and the general associations between risk attitudes and self-reported DUI behaviour.

## 2. Methods

### 2.1. Participants and procedure

Interviews were conducted as part of the ecstasy and related drug reporting system (EDRS), which examines trends in substance use, associated risk behaviours and health-related harms among REU in Australian capital cities on an annual basis. Participants in the present study were EDRS participants interviewed in 2007 ( $n = 573$ ) or 2011 ( $n = 429$ ) who reported having driven a car in the last six months (Black et al., 2008; Sindicich and Burns, 2012). None of the participants interviewed in 2011 reported having taken part in 2007.

Participants were recruited through a purposive sampling strategy, which included distribution of posters at various locations (e.g., cafes, nightclubs, music stores, and universities), posting on internet forums, and through word of mouth. Potential participants contacted the researchers and were screened for eligibility. Inclusion criteria required that participants be at least 16 years, to have used ecstasy at least once a month during the preceding six months, and been a resident of the relevant capital city for the past year. Ethics approval was granted by ethics committees in each jurisdiction. Participants gave written informed consent prior to the interview and all information provided was confidential and anonymous.

Structured interviews took 45–60 min to complete and were administered by trained interviewers. Participants were reimbursed \$30AUD (2007) or \$40AUD (2011) for expenses. Participants self-reported whether they had DUI of alcohol and 'driven after taking' illicit drugs during the six months preceding the interview. DUI of alcohol was defined as driving while self-perceived to be over the legal limit (blood alcohol content, BAC, over 0.05). Given the lack of standard definitions of DUI for various illicit drug types, DUI of illicit drugs was based on participants' subjective perceptions that they were 'under the influence' of the drug at the time. Participants also rated their perception of both the likelihood of having a crash and the likelihood of being apprehended by police if they were DUI of alcohol (over the legal limit), ecstasy, cannabis, and methamphetamine on a 5-point Likert scale ranging from 1 (very unlikely) to 5 (very likely).

### 2.2. Design and data analysis

Statistical analyses were conducted using IBM SPSS 20.0 for Windows (SPSS Inc., 2011) with multivariate regression modelling conducted in MPlus 7.1. The  $\chi^2$  test and 95% confidence intervals were used to compare categorical data and the non-parametric Mann–Whitney  $U$  test was used to test for significant differences in continuous data. Multivariate logistic regression using robust maximum likelihood estimation was used to examine the association between crash and legal risk perceptions and DUI of substances (alcohol, cannabis, ecstasy, and methamphetamine) in the last six months. Sex, age, frequency of substance use, interview location and year were included in regression models as control variables.

## 3. Results

### 3.1. Demographic characteristics

There were a significantly greater proportion of male and heterosexual participants among the 2011 relative to the 2007 sample (Table 1). There were no significant differences in the proportion who were from an English speaking background or who identified as an Aboriginal or Torres Strait Islander. Both samples reported a mean of 12 years education but a greater proportion of the 2007 sample reported completion of a tertiary qualification (trade/technical or university) or current full-time employment. In contrast, a greater proportion of the 2011 sample reported that they were currently studying or currently unemployed. There were no significant differences in the proportion reporting current drug treatment or being arrested in the last 12 months.

### 3.2. Alcohol and illicit drug use

Both samples reported a median of 12 days use of ecstasy in the last six months (Table 2). A higher proportion of the 2011 sample reported recent use of alcohol, but recent use of alcohol was reported by a large majority (97–99%) of both samples and there was no significant difference in the median frequency of use (48 days) in the last six months. Approximately four-fifths (82–85%) of each sample reported use of cannabis in the last six months, and while the median frequency of this use tended to be greater in 2011 relative to 2007, this was not statistically significant ( $p = 0.09$ ).

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