Does providing pill testing at festivals increase intention to use Ecstasy?

Sherri Lee Murphy

Edith Cowan University

Follow this and additional works at: https://ro.ecu.edu.au/theses_hons

Part of the Psychology Commons, and the Substance Abuse and Addiction Commons

Recommended Citation
Murphy, S. L. (2020). Does providing pill testing at festivals increase intention to use Ecstasy?. https://ro.ecu.edu.au/theses_hons/1542

This Thesis is posted at Research Online.
https://ro.ecu.edu.au/theses_hons/1542
Edith Cowan University

Copyright Warning

You may print or download ONE copy of this document for the purpose of your own research or study.

The University does not authorize you to copy, communicate or otherwise make available electronically to any other person any copyright material contained on this site.

You are reminded of the following:

- Copyright owners are entitled to take legal action against persons who infringe their copyright.

- A reproduction of material that is protected by copyright may be a copyright infringement. Where the reproduction of such material is done without attribution of authorship, with false attribution of authorship or the authorship is treated in a derogatory manner, this may be a breach of the author’s moral rights contained in Part IX of the Copyright Act 1968 (Cth).

- Courts have the power to impose a wide range of civil and criminal sanctions for infringement of copyright, infringement of moral rights and other offences under the Copyright Act 1968 (Cth). Higher penalties may apply, and higher damages may be awarded, for offences and infringements involving the conversion of material into digital or electronic form.
Does Providing Pill Testing at Festivals Increase Intention to use Ecstasy?

This thesis is presented for the degree of

Bachelor of Arts (Psychology) Honours

Sherri Lee Murphy

Edith Cowan University
School of Arts & Humanities
2020
USE OF THESIS

The Use of Thesis statement is not included in this version of the thesis.
Does Providing Pill Testing at Festivals Increase Intention to use Ecstasy?

Sherri L Murphy

A report submitted in Partial Fulfilment of the Requirements for the Award of Bachelor of Arts/Science (Psychology) Honours, School of Arts and Humanities, Edith Cowan University.

Submitted (28 October, 2019)

I declare that this written assignment is my own work and does not include:

(i) material from published sources used without proper acknowledgement, or

(ii) material copied from the work of other students

Signed:  

Dated: 28 October 2019
Abstract

Calls to provide sanctioned pill testing (drug checking) at music festivals has met with resistance from most Australian governments due to a concern that such services would increase use of ecstasy and other drugs. To address an important gap in current knowledge, I investigated how a pill testing service might influence intention to use ecstasy. I also drew from the Theory of Planned Behaviour to examine what determinants of behaviour predict intention to use a pill testing service. Music festival attendees ($N = 247$) were presented with three hypothetical pill testing scenarios: The current legal circumstance where consumers only have access to poorly reliable reagent testing kits that can be purchased online, an onsite pill testing service, and a fixed site pill testing. Results revealed that there was no significant difference in the mean scores of Intentions for participants ($n = 35$) who had never used ecstasy, or participants ($n = 212$) who had ever used ecstasy. These data provide no evidence that offering a pill testing service at a festival will result in ecstasy use by people who have never used ecstasy or lead to increased use among people with past ecstasy use. The combination of attitudes, subjective norms, perceived behavioural control, gender and education level predicted intention to use a fixed site pill testing service, while only subjective norms predicted intention to use an onsite service. The Theory of Planned Behaviour works well when a person has to engage in a series of deliberate planned behaviours, but not as well when the behaviour involves a simple decision influenced by social networks and perceptions of peer support.

Author: Sherri L Murphy

Supervisors: Dr Greg Dear and Dr Stephen Bright

Word count: 11,876
COPYRIGHT AND ACCESS DECLARATION

I certify that this thesis does not, to the best of my knowledge and belief:

(i) incorporate without acknowledgement any material previously submitted for a
degree or diploma in any institution of higher education;

(ii) contain any material previously published or written by another person except
where due reference is made in the text; or

(iii) contain any defamatory material.

Signed:

Dated: 28 October 2019
Acknowledgements

I would like to acknowledge my brilliant supervisors, Dr Greg Dear and Dr Stephen Bright who have mentored me through this process with patience, encouragement, wisdom and laughter. Greg, thank you for this research idea, your razor-sharp mind and attention to detail, particularly with the results section. Steve, thank you for getting us into the festival, pushing me to exceed my own limitations, conscientiously making notes on my drafts and for spending three memorable days collecting data. A special thank you to the organising committee of the festival for allowing us to collect data within the festival grounds. Without your blessing I would not have obtained such a representative sample or produced such valuable findings. Thank you to all the participants who took part in the survey, this research is your voice. To my family and friends, thank you for your beautiful words of encouragement and support. Lastly, thank you to my husband Chris. Your love and support allowed me to achieve this milestone, with you by my side anything is possible.
# Table of Contents

List of Tables ........................................................................................................... ix

List of Figures ............................................................................................................. xi

Introduction .................................................................................................................. 1

Harm reduction in Australia ......................................................................................... 2

Pill testing ..................................................................................................................... 3

Fixed site pill testing services ..................................................................................... 4

Onsite pill testing services .......................................................................................... 5

Pill testing in Australia ................................................................................................. 6

Theory of Planned Behaviour ....................................................................................... 9

Components of the Theory of Planned Behaviour ..................................................... 11

Interaction effects ....................................................................................................... 13

Study objectives and hypotheses ............................................................................... 14

Hypothesis 1. ............................................................................................................... 14

Hypothesis 2. ............................................................................................................... 14

Hypothesis 3. ............................................................................................................... 15

Hypothesis 4. ............................................................................................................... 15

Method ......................................................................................................................... 15

Research design ......................................................................................................... 15

Participants .................................................................................................................. 15

Materials ....................................................................................................................... 18

Measures ....................................................................................................................... 18

Questionnaire ............................................................................................................... 18

Type of Pill Testing ...................................................................................................... 19

Intention to Use Ecstasy .............................................................................................. 19
Procedures ........................................................................................................20
Results ...............................................................................................................21
  Statistics and data analysis .........................................................................21
  Hypothesis 1. .................................................................................................21
  Hypothesis 2. .................................................................................................23
  Multiple regression analysis ......................................................................25
  Interaction variables ....................................................................................25
  Hypothesis 3. .................................................................................................26
  Hypothesis 4. .................................................................................................27
Discussion .........................................................................................................29
  Intention to initiate or increase ecstasy use ... ............................................29
  Intention to use a pill testing service ..........................................................32
  Study limitations and future considerations ..............................................37
  Conclusion .....................................................................................................39
References .........................................................................................................41
APPENDIX A ....................................................................................................49
APPENDIX B .....................................................................................................50
APPENDIX C .....................................................................................................53
APPENDIX D .....................................................................................................54
APPENDIX E .....................................................................................................55
APPENDIX F .....................................................................................................56
APPENDIX G .....................................................................................................57
APPENDIX H .....................................................................................................58
List of Tables

Table 1. ........................................................................................................................................... 16
Table 2. ........................................................................................................................................... 27
List of Figures

Figure 1. The Theory of Planned Behaviour (Ajzen, 2011) .........................................................10

Figure 2. Graph Showing Total Percentage of Substance Use by Study Participants in the Past Twelve Months...........................................................................................................17

Figure 3. Column graph showing total count of participant responses for reagent pill testing
\( (n = 35) \) ......................................................................................................................................22

Figure 4. Column graph showing total count of participant responses for onsite pill testing
\( (n = 35) \) ......................................................................................................................................22

Figure 5. Column graph showing total count of participant responses for fixed site pill testing
\( (n = 35) \) ......................................................................................................................................22

Figure 6. Column graph showing total count of participant responses for reagent pill testing
\( (n = 212) \) ......................................................................................................................................24

Figure 7. Column graph showing total count of participant responses for onsite pill testing
\( (n = 212) \) ......................................................................................................................................24

Figure 8. Column graph showing total count of participant responses for fixed site pill testing
\( (n = 212) \) ......................................................................................................................................24
Does Providing Pill Testing at Festivals Increase Intention to use Ecstasy?

A recent report by the United Nations Office on Drugs and Crime ([UNODC], 2019), indicates that Australia has one of the highest rates of ecstasy use worldwide (2.2%). Further, according to a paper on the pharmacological contents of ecstasy, Australia is one of the most dangerous countries in the world to consume it. This is largely due to a variety of impurities, such as the potentially deadly ingredient paramethoxymethamphetamine (PMMA) and increasingly high levels of pure methylenedioxyamphetamine (MDMA; Peck, Clough, Culshaw, & Liddell, 2019). Ecstasy is a general term used to describe an illicit substance that contains MDMA, and it is primarily used for its euphoric and Energising effects (Green, Cross, & Goodwin, 1995). Unlike MDMA used in clinical trials, ecstasy is produced in clandestine conditions, and the terms should not be used interchangeably (Hondebrink et al., 2015).

Music festivals are a popular social space where young adults engage in risky drug use behaviours (Day et al., 2018). Both International (Groves, 2018; Hungerbuehler, Buecheli, & Schaub, 2011) and Australian (Day et al., 2018) research has found that the prevalence of ecstasy use among young adults at music festivals is considerably greater than general population rates. Although deaths from pure MDMA are rare, the deaths that do occur are often the result of high doses leading to hyperthermic syndromes characterised by increased body temperature (i.e., higher than 38.8°C; Davis & Rosenberg, 2016). Indeed, music festivals can increase the risk of this syndrome as ambient temperatures reach higher than normal levels, particularly in the Australian summer. The risk is exacerbated if the individual engages in strenuous dancing for extended periods of time without fluid replacement or rest (Davis & Rosenberg, 2016). Tragically, six young Australians died from suspected drug overdose at Australian music festivals from December 2018 to January 2019 (Lowery, 2019). Ecstasy toxicity and overheating were evidenced in each case.
Without testing an illicit substance sold as ecstasy, there is no way to know whether it contains high purity MDMA or an adulterated substance. In Australia, self-testing kits such as reagents are a legal means for an individual to test their drugs (Bright, 2019). A reagent is a chemical compound or mixture that is added to a system for a chemical reaction. A small amount of substance is scrapped into the testing liquid. The chemical then changes colour and is compared to a colour chart to indicate which active ingredients the substance might contain (Bright, 2019). However, the test does not determine the purity of the substance or detect multiple ingredients (Martins et al., 2017). Personal test kits are a preliminary tool for drug analysis at best, but are “far better than blindly swallowing tablets” (Bright, 2019, as cited in Deutrom, 2019, para. 1).

The only sure way to know what ingredients are in an illicit substance is to have the drug analysed with laboratory grade equipment at a pill testing service (also referred to as drug checking; Barratt et al., 2018). Yet, there are no ongoing sanctioned pill testing services available in Australia. Pill testing is a harm reduction strategy that has been met with contention in Australia, despite 20 countries across Europe, the Americas and New Zealand implementing various services with empirical success (Brunt et al., 2017; Measham, 2019; Hungerbuehler et al., 2011). Critics of pill testing cite concerns that “it’ll give people a green light to taking substances” ("Pill Testing", 2018, para. 2).

**Harm reduction in Australia**

Australia’s official policy of harm minimisation centres around three key areas: (1) harm reduction (i.e. strategies that aim to reduce the harms from drug use, for individuals and communities, and do not necessarily aim to stop drug use); (2) supply reduction (i.e. strategies including law and legislation that aim to reduce the production and supply of illicit drugs); and (3) demand reduction (i.e. strategies that aim to prevent the uptake of harmful drug use; Department of Health [DOH], 2019). At its core, harm reduction focuses on an
underlying public health framework in which an evidence-based approach is used to evaluate interventions in relation to the impact of net harm. As such, harm reduction’s defining features focus on the prevention of harm rather than preventing drug use itself, as drugs are part of everyday society (Ritter, King, & Hamilton, 2013).

Over the past few decades the likely benefits of implementing harm reduction strategies have been recognised and applied in many areas in Australia. Some of these include; road safety campaigns; informal Needle and Syringe Programs (NSPs); a medicalised injecting centre; and the first peer-initiated naloxone distribution program (Ritter et al., 2013). While Australia has implemented successful harm reduction measures in the past, there is growing concern that stringent drug laws that criminalise all drug use are arguably the greatest barrier to more innovative harm reduction methods (Ritter et al., 2013). For example, Europe and the United States have early warning systems to detect local trends in drug use or psychoactive substances that threaten public health (McCutcheon et al., 2019).

Harm reduction strategies that focus on the environments where drug use occurs aim to reduce risk by conceptualising drug harms as a product of the social situation in which an individual participates (Duff, 2010). Dalgarno and Shewan (2005) argue that while the effects of taking a particular drug are the primary motivation for consumption, the setting in which the drug is consumed is of fundamental importance to ensure the effect is what the consumer intended and expected. Accordingly, music festivals offer a targeted prevention and harm reduction opportunity to help reduce ecstasy-related harm.

**Pill testing**

Pill testing is a harm reduction strategy that enables consumers to have illicit substances analysed at venues, festivals and other locations, for the purpose of reducing the harms associated with consuming illicit drugs (Butterfield, Barrat, Ezard, & Day, 2016). It originated in the Netherlands in the early 90’s as a pragmatic response to an emerging global
trend that saw the normalisation of ecstasy consumed at dance raves and music festivals by young people (Groves, 2018). Pill testing is now an official part of drug policy in the Netherlands. Similar initiatives followed in other European nations and the United States, albeit predominantly privately funded (Brunt et al., 2017; Groves, 2018). The two main forms of pill testing service, fixed site and onsite, are described in the following section and their advantages and disadvantages are discussed. By reviewing these services, it will be possible to make inferences about the general perceptions of these services and their importance as a harm reduction measure.

**Fixed site pill testing services**

Back of house fixed site drug checking services are already provided by police through analysis of seized drugs after an incident, or drugs put in amnesty bins. However, these results are usually not made public in Australia (Groves, 2018). The Drug Information and Monitoring Service (DIMS) in the Netherlands has provided Dutch citizens with a front of house fixed site service since 1992 (Brunt & Niesink, 2011). Unlike back of house services, this service provides individuals with the opportunity to have substances analysed and to obtain detailed information about the contents. As a result, DIMS analyse approximately 12,000 samples annually. In turn, this information is shared with the Dutch government to issue health warnings of potentially dangerous Novel Psychoactive Substances (NPS) such as PMMA and N-benzl Methoxy (NBOMe) (Edmunds, Donovan, & Reynolds, 2018). For example, when PMMA was identified in ‘Superman’ pills by DIMS in 2014, an alert was issued and no Dutch citizens died. By comparison, in the UK there were no front of house fixed site drug checking services and four people died after taking similar pills (Measham, 2019). In addition to early public health alerts, fixed site services allow for brief interventions for harder to reach recreational drug consumers (Hungerbuehler et al., 2001). Despite an increase in the purity of MDMA across Europe, the Netherlands has not seen a
significant increase in deaths from MDMA toxicity compared with other European countries (European Monitoring Centre for Drugs and Drug Addiction [EMCDDA], 2018).

Whilst fixed site services are able to provide the most accurate chemical analysis, it is rarely viable both economically and situationally to provide fixed site drug checking services at music festivals. Furthermore, analysis through a fixed site service is not timely or opportunistic, with wait times for analysis between one to seven days (Brunt et al., 2017). A survey of 851 Australians who use ecstasy found that while 85% of respondents would use a fixed site drug checking service, 61% would use a service that required a one week turn around for results, and only 36% would use a fixed site service that did not provide individual feedback of results (Barratt et al., 2018).

### Onsite pill testing services

Back of house onsite pill testing services have been provided as a harm reduction strategy at festivals in the UK since 2013 (Lee & Barratt, 2019). When a potentially life-threatening substance is found during the festival, an onsite alert is sent out through social media to warn participants who may have purchased drugs from similar batches (Lee & Barratt, 2019). This system allows for police to better monitor the drug market and to potentially reduce harms for individuals that consume drugs. Furthermore, medical teams and volunteers are better informed and supported when dealing with presentations (Lee & Barratt, 2019). Front of house onsite pill testing services offer a unique advantage in that they can provide opportunistic interventions within the situation that drug use is occurring. It also aims to increase positive behaviour before drug consumption, by offering a brief intervention and referral to support services if needed (Butterfield et al., 2016; Day et al, 2018). Measham (2019) found that onsite pill testing had reduced the incidence of hospital admissions by 95% at a major music festival in the UK (Measham, 2019).
The types of techniques used for onsite analysis vary considerably, and are also highly dependent on available funds, aims, service setting and the type of service provided (or allowed; Brunt et al., 2017). Techniques vary from colorimetric reagents to advanced Raman spectroscopy and gas chromatography which is more expensive but extremely accurate (Day et al., 2018). Many international onsite pill testing services make use of a variety of testing methods, including both high-performance liquid chromatography devices and reagent test kits. While these provide immediate results for consumers, more extensive analysis may be required off site (Day et al., 2018). As the varying types of pill testing measures and the nature of these services can affect the accuracy and reliability of analysis results, the degree of harm reduction would consequently be affected (Winstock et al., 2001).

**Pill testing in Australia**

Community support for onsite pill testing in Australia is notably high (Groves, 2018; Makkai et al., 2018; Munn et al., 2016; Palamar & Barratt, 2019). Indeed, research commissioned by the Australian National Council on Drugs found that 82% of an Australian sample aged between 16 and 25 supported the introduction of pill testing at music venues (Day et al., 2018). The ACT government has sanctioned two trials of onsite pill testing at the Groovin the Moo music festival in 2018 and 2019 (Lowery, 2019; Byrne, Gock, Cowling, & Faunce, 2018), and pill testing advocates have hailed both trials as a success (Lowery, 2019).

The 2019 trial organisers reported that 230 people used the pill testing service, with a total of 171 substances tested, compared with 85 substances the previous year (Lowery, 2019). Seven substances were found to contain a potentially lethal ingredient. Of the people given this information all but one discarded their drugs in the amnesty bins provided by the service, and the remaining person reported that they planned to dispose of the substance. Organisers also reported that 86% of the substances tested returned positive results for high
purity MDMA. These consumers were given important psychoeducation on the potential dangers of high dose MDMA (Lowery, 2019).

Despite this, Australian governments and pill testing critics have been reluctant to implement onsite pill testing services, citing concerns that it will ‘send the wrong message’, and condone illicit drug use. Consequently, critics believe that illicit drug use will increase (Preiss & Carey, 2019). However, there is no evidence that initiation or increased drug prevalence have increased more in European countries with onsite pill testing services than in countries without onsite pill testing services (Brunt et al., 2017; Measham, 2019). For example, Hungerbuehler et al. (2011) conducted an exploratory study of the experiences of patrons who used a drug checking facility in Zurich. There were 7622 consultations and 1376 participants filled out questionnaires. The authors found that a pill testing service did not increase the reported consumption of illicit party drugs such as ecstasy, or increase intended frequency of use.

The concern that reducing harm with onsite pill testing may be offset by an increase in drug use is not empirically supported. Martins et al. (2017) found that 24% of suspected LSD tested at a music festival in Portugal did not contain LSD and instead contained other substances. Of those attendees who received this information, 74% of the reported that they did not intend to consume the substance. In Canada, Saleemi (2017) found that 76% of people who found out that their suspected MDMA did not contain MDMA reported that they would not consume the drug and instead would warn their friends.

In a seminal study on the behavioural and operational outcomes of the UK’s first pilot drug checking service, Measham (2019) found that one in five participants who used the service were sold adulterated substances. Over one in five service users chose to use the disposal bins provided following their test results. Two thirds of service users who received unexpected results handed over further substances in their possession, in contrast to one in
ten participants of those who received expected results. Measham also found that substances bought inside the festival grounds were more than twice as likely to contain adulterants than substances bought offsite. Research from the UK could be seen as comparable to the Australian context.

Nonetheless, pill testing is one of many harm reduction strategies, and cannot be viewed as a panacea for preventing harmful outcomes for all individuals. Given the diversity of individual differences and the dimensions that exist between these differences (Butler & Montgomery, 2004), it would be unreasonable to expect that pill testing would be the best harm reduction method for all festival attendees. In Australia, Hollett and Gately (2019) employed a quantitative field study of festival attendees to determine risk intentions following a hypothetical pill test result. They found that people with past MDMA use had less intention to practice risk reduction strategies following a pill test scenario with particular outcomes. For example, when the result showed a potentially lethal substance such as PMMA the participants showed reduced risk intentions. However, when the result indicated an unknown substance or contained a double dose, the intention of participants did not change. The authors also found evidence in support of other harm reduction methods following a pill testing scenario such as, psychoeducation and referrals to further support services.

These results reinforce that standalone pill testing will not prevent harm for all individuals. Instead, the provision of psychoeducation and support will be an integral part of the model’s success in Australia. Pill testing is designed to mitigate risk for people that already intend to use an illicit drug. Indeed, the assumption that pill testing will give a ‘green light’ for illicit drug use does not seem probable. For these reasons I expect that participants within the current study who are ecstasy naïve or have had past use, will not increase their intention to use or increase use due to the availability of a pill testing service.
In the absence of sanctioned pill testing services, many Australians who use ecstasy have still been trying to determine the contents of their drugs. Barratt et al., (2018) found that 53% consulted pill-report websites and 23% used reagent test kits or advanced testing services (e.g., sending drugs to overseas services for analysis). While studies on the use of onsite pill testing at music venues have shown a reduction in risky drug taking behaviour (Measham, 2019), particularly when the pill test revealed a harmful adulterant (Martine et al., 2017; Saleemi, 2017), more research is needed in the Australian context. To date there is no available research explicitly investigating the influence an onsite or fixed site pill testing service might have on ecstasy initiation or increased use. Furthermore, the determinants of behaviour that impact an individual’s intention to use an onsite or fixed site pill testing service remain unknown.

Although ecstasy use at music venues might be explained by sociocultural, structural and developmental factors, proximal determinants of ecstasy use are likely to include beliefs about the drug (Davis & Rosenberg, 2016). When developing interventions to change health-related behaviour, it is important to effectively predict and explain those determinants of behaviour.

**Theory of Planned Behaviour**

The Theory of Planned Behaviour (TPB) is a social-cognitive model used for understanding and predicting behaviour (Ajzen, 1985). The TPB is a refinement to the earlier model, Theory of Reasoned Action (Fishbein & Ajzen, 1975). According to the TPB the most immediate determinant of behaviour is one’s intention to engage in a behaviour at some point in time. Intention is viewed as the motivational component that encourages a person to engage in a certain behaviour. The TPB postulates that while intention directly predicts behavioural implementation, it is predicted by three motivational components: (1) Attitudes. The beliefs surrounding the positive or negative outcomes of engaging in a certain behaviour
(2) Subjective norms. The beliefs about whether one’s social groups condone or condemn the behaviour and the perceived pressure to comply. (3) Perceived behavioural control (PBC). The belief in one’s ability to engage successfully in the behaviour (Ajzen, 1985; see Figure 1).

**Figure 1.**

![Diagram of the Theory of Planned Behaviour (TPB) (Ajzen, 1985).]

The TPB is a model that could be applied to help explain ecstasy use intentions if pill testing was sanctioned in Australia. Davis and Rosenberg (2016) examined whether the TPB components predicted the intention to use a personal testing kit or online drug checking service. They found that the model accounted for 71% of the variance in intention to use these forms of pill testing as a harm reduction strategy. This suggests that there is significant potential to apply a comparative study design within the Australian context. To my knowledge, no study has applied the TPB variables to examine what determinants of behaviour might predict the use of an onsite or fixed site pill testing service.

Overall, the TPB has been shown to adequately predict 40-49% of the variance in intention and 26-36% of the variance in engaging in a given behaviour (McEachan, Conner, Taylor, & Lawton, 2011). The theory has been successfully used to predict a wide range of health-related behaviours including; decisions to ride with an intoxicated driver (Moan, 2013); safe injecting practise (Gagnon & Godin, 2009); treatment completion (Zemore & Ajzen, 2013); binge drinking (Norman & Conner, 2006; Kim & Hong, 2013) and ecstasy use.
For example, Orbell, Blair, Sherlock and Conner (2001) provide support for ecstasy use as a planned behaviour. They reported results from a prospective survey on the predictive ability of the TPB and ecstasy use, and found that ecstasy use over a two-month period was directly predictable from intention to use the substance. McMillan and Conner (2003) used the TPB to test the factors underlying intentions to use illicit drugs, including ecstasy. The authors conducted a six-month study of 494 undergraduate students in the UK. Overall, they found support for the TPB adding to the predictive ability of intentions ($R^2 = .49$) to use an illicit substance. For these reasons I expect that the TPB will provide a good basis for predicting the use of a pill testing service.

**Components of the Theory of Planned Behaviour**

Although much of the research supports TPB’s predictive validity, there is more support for some of the model’s components than others. Previous research suggests that normative influences play an important role in risk behaviours such as drug use. For example, a study by Leitner et al. (1993) found that 90% of survey participants cited peer pressure as a cause of drug use. Ecstasy use is closely associated with a music culture, where the use of ecstasy is likely to be normalised socially (Day et al., 2018). Yet, when it comes to normative influences, the TPB appears to produce findings in conflict with predictions. In line with normative influences from other studies, Johnston and White (2003) tested the predictive ability of the TPB components in a longitudinal study of binge drinking behaviour in college students. The authors found that perceived pressure from important others was an independent predictor of intention to engage in such behaviour. Despite this, there is less overall support for the link between subjective norms and intention in the TPB model. For example, a comprehensive meta-analysis on the predictive validity of the TPB across several health domains found the average contribution of attitudes when predicting behavioural
intentions was 0.49. In contrast, subjective norms only predicted 0.34 of the variance (McEachan, et al., 2011).

Terry, Hogg and White (1999) have argued that the TPB does not account for the effect social identification to a group can have over one’s own attitudes and intentions. Researchers adopting a Social Identity Theory (SIT) approach in the role of social influences on behavioural intentions propose that a person’s attitude towards a behaviour and their intention to engage in the behaviour will depend heavily on what attitudes their social group holds, and whether they support the behaviour (Tajfel & Turner, 2010). In response to the weak link between subjective norms and intention, Ajzen (2011) proposed that the lack of evidence supports the view that generally intentions are influenced by personal attributes such as attitudes. Furthermore, he suggested that the importance of attitudes and subjective norms in relation to predictions will vary within the specific population, and context of the behaviour under investigation.

Supporting Ajzen’s (2011) view, McEachan, et al. (2011) discovered that the strength of the associations between the TPB components and intention to engage a given health-related behaviour varied, dependent upon sample characteristics and the target behaviour in question. Sample characteristics included gender and education. For example, correlations between subjective norms and intention were strongest for risk behaviours, similarly found by Albarracin, Kumkale, and Johnson (2004). It is therefore reasonable to expect that attitudes and subjective norms will be identified as independent predictors of intention to use a pill testing service. Interestingly, the strength of the TPB components appear to be moderated by factors such as behaviour type and sample characteristics. For this reason, I will include gender and education level to elucidate whether these aspects are also independent predictors of intention, or help explain some of the variance.
**Interaction effects**

Later iterations of the TPB have proposed that its core components have interaction (or moderating) effects between each other. For example, the impact of perceived behavioural control on intentions has shown that intentions are stronger when perceived behavioural control is higher. Interaction effects between perceived behavioural control and intention have also shown opposite effects depending on the behaviour in question. Eagly and Chaiken (1993) argued that people who perceive they have control over a certain behaviour would not necessarily act if they thought the behaviour was negatively evaluated. As such, if a behaviour was judged negatively, perceived behavioural control might be unrelated or negatively related. The authors also proposed an opposite effect, when the behaviour was positively evaluated perceived behavioural control was a significant predictor of intention.

In partial support of this, Conner and McMillan’s (1999) study on cannabis use found evidence for interaction effects between perceived behavioural control and attitude. They found that perceived behavioural control predicted cannabis use as a function of attitudes. If attitudes towards the behaviour were neutral or negatively evaluated, then perceived behavioural control was negatively related to intention: The higher the perceived control the weaker the intention to use cannabis. However, they did not find evidence for the reverse effect as proposed by Eagly and Chaiken (if behaviour was positively evaluated perceived behavioural control would predict intention).

In a later study, Umeh and Patel (2004) tested for interaction effects between the TPB components in relation to ecstasy use and found evidence to support Eagly and Chaiken’s reverse effect. In a cross-sectional survey of 200 young adults in the UK, the authors found that previous ecstasy use and more positive attitudes towards ecstasy use independently predicted intention to use in the future. The authors also found that as attitudes towards
ecstasy use were more positive, perceived behavioural control was a better predictor of intended use.

In an environment such as a music festival, where drug use is more socially acceptable and attitudes are favourable, perceived behavioural control might positively predict intention to use ecstasy. However, the present study is testing the TPB components predictive ability of intention to use a pill testing service. It is feasible to expect that if attitudes are favourable towards an onsite pill testing service, and festival goers were concerned about the content of their drugs, then perceived behavioural control might not have an effect on intention, as per Conner and McMillan (1999). In contrast, if attitudes were favourable towards drug use and a pill testing service was available, then perceived behavioural control might predict intention to use a service. Looking for interaction effects between the TPB variables may increase our understanding of the psychological determinants of intention, while still maintaining parsimony in the model. In light of this, I will examine interaction effects relative to hypothesis three and four.

**Study objectives and hypotheses**

My goal was to explore: (1) whether or not a pill testing service would increase intention to consume ecstasy, and (2) what psychological determinants of behaviour might predict an individual’s use of a pill testing service (as per the TPB). While previous research on ecstasy use behaviour has made unique contributions to discussions on pill testing, a comprehensive understanding of intentions in the Australian context is lacking. The present study might have significant implications for future sanctioned pill testing models, and what harm reduction interventions might best serve Australians that attend music festivals. Therefore, I aimed to test four hypotheses in relation to ecstasy use intentions and pill testing.
Hypothesis 1. People who have *never* consumed ecstasy will report a greater intention to use ecstasy when an onsite or fixed site pill testing service is available than when those pill testing services are not available.

Hypothesis 2. People who have *ever* consumed ecstasy will report a greater intention to use ecstasy when an onsite or fixed site pill testing service is available than when those pill testing services are not available.

Hypothesis 3. Attitudes, subjective norms and perceived behavioural control among people who use ecstasy will independently predict their intention to use an onsite pill testing service.

Hypothesis 4. Attitudes, subjective norms and perceived behavioural control among people who use ecstasy will independently predict their intention to use a fixed site pill testing service.

Method

Research design

I employed a quasi-experimental design for this study. For hypotheses one and two, I used one within-subjects independent variable (IV), Pill Testing, and one dependent variable (DV), Intention. Pill testing consisted of three levels: (1) reagent pill testing; (2) onsite pill testing; and (3) fixed site pill testing, with one DV, Intention. Power analysis was conducted in G'Power. For repeated measures analysis of variance (ANOVA) with three groups, a power of .80, an alpha level of .05 and medium effect size ($f = .25$) the required sample size was 28.

Eight IV’s were used for hypotheses three and four; gender, education level, Attitude, Subjective Norms; Perceived Behavioural Control; Attitude x Subjective Norms; Attitude x PBC; Subjective Norms x PBC; and one IV, Intention (as per TPB). To obtain sufficient statistical power for multiple regression analysis there must be a minimum of ten
observations per variable (Field, 2013). To detect a medium effect size ($f = .25$), as recommended by Cohen (1988), the minimum sample size needed was 80 participants (with an alpha level of .05).

**Participants**

Participants were purposely and opportunistically sampled from a music festival in Western Australia over a three-day period. Participants were individually approached by myself and my accompanying supervisor (Dr Stephen Bright), and invited to complete the survey if they were 18 years or older. A total of 247 participants were recruited ($M = 29.14$, $SD = 6.72$). As Table 1 shows, 123 (50%) participants identified as male, 118 (48%) as female, four (1.6%) as other and two (0.8%) declined to respond (see Table 1 for participant demographics). The sample was also representative in terms of geographic location. An examination of Figure 2 reveals 86% of the entire sample ($N = 247$) had consumed ecstasy/MDMA in the past 12 months. Additionally, 52% had consumed ecstasy/MDMA 48 hours prior to completing the survey. See Figure 2 for drug use history characteristics.

**Table 1**

*Demographic Characteristics of Participants by Study Sample*

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>% ($N = 247$)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>48</td>
</tr>
<tr>
<td>Male</td>
<td>50</td>
</tr>
<tr>
<td>Other</td>
<td>2</td>
</tr>
<tr>
<td>Decline to respond</td>
<td>1</td>
</tr>
<tr>
<td>Agea</td>
<td></td>
</tr>
<tr>
<td>19-24</td>
<td>20</td>
</tr>
<tr>
<td>25-34</td>
<td>52</td>
</tr>
<tr>
<td>35-62</td>
<td>13</td>
</tr>
<tr>
<td>Ethnicity</td>
<td></td>
</tr>
<tr>
<td>Caucasian</td>
<td>82</td>
</tr>
<tr>
<td>Asian/Pacific Islander</td>
<td>4</td>
</tr>
<tr>
<td>Aboriginal/Torres Strait Islander</td>
<td>4</td>
</tr>
<tr>
<td>Other/Multi-racial</td>
<td>8</td>
</tr>
<tr>
<td>Decline to respond</td>
<td>2</td>
</tr>
<tr>
<td>Australian state of residence</td>
<td></td>
</tr>
<tr>
<td>Western Australia</td>
<td>86</td>
</tr>
</tbody>
</table>
New South Wales  2
Victoria  2
Northern Territory  .4
Queensland  2
I do not live in Australia  6

Education level
12th grade or less  8
Graduated high school or equivalent  17
College or Tafe  26
Bachelor’s degree  38
Master’s degree or higher  10

Relationship status
Single  52
Married/partnered  48

*Note. Some totals do not sum to 100% due to rounding.*

*a n = 210 for Age (37 participants did not answer this question)*

**Figure 2.**

*Graph Showing Total Percentage of Substance Use by Study Participants in the Past Twelve Months*

Of the participants who reported ever using ecstasy (*n* = 212), 85% reported a music festival being the most typical environment for consumption. The highest count for the amount of times a participant had used ecstasy over the course of their lifetime was 1 to 10.
The second highest count was 100 or more times. Additionally, participants who consumed ecstasy/MDMA were asked to identify what percentage of time they used a reagent test kit or checked an online ecstasy/MDMA testing service in the past year. Of these participants, 50% reported using a reagent test kit and 39% reported having checked an online testing service for the presence of ecstasy/MDMA or adulterants. These participants were also asked if “a reagent test kit is beneficial to me” and 76% of the sample indicated that they moderately to strongly agreed. Participants were also asked to describe any other harm reduction strategies they had used while using ecstasy over the past year (Appendix N).

Materials

All participants completed the Participant Information Statement and Informed Consent form (Appendix B). The TPB questionnaire components were adapted from Ajzen (2006), and Davis and Rosenberg (2016), (Appendix F to K). All participants were administered three psychometric instruments adapted from Davis and Rosenberg (2016); a Substance Use History Questionnaire (Appendix C, for results see Table 2); Ecstasy Use History Questionnaire (Appendix D) and a Demographics Questionnaire (Appendix L). The Demographics Questionnaire was contextualised to suit an Australian context (see Table 2). Only participants who indicated past use of ecstasy filled out the Ecstasy-Related Harm Reduction Strategies Frequency Questionnaire (Appendix E), adapted from Davis and Rosenberg (2016).

Measures

Participants who reported past use of ecstasy/MDMA were asked how often they had used a reagent pill testing kit while using ecstasy/MDMA from Never/0% of the time to Always/100% of the time (in increments of 10%). They were asked to indicate any other form of harm reduction strategy with an open text box from Never/0% of the time to Always/100% of the time (in increments of 10%).
Questionnaire. The questionnaire employed direct measures of the TPB constructs in relation to ecstasy-related behaviour. Short vignettes (Appendix F to K) briefly summarised each pill testing condition. Participants were directed via parameters in Qualtrics to either block one or two, depending upon reported ecstasy consumption. The questions were slightly modified to suit people who had never used ecstasy (Appendix F to H) and people who had ever used ecstasy (Appendix I to K). Participants responded to each of the items using a 7-point Likert type scale ranging from, strongly disagree = 1, to strongly agree = 7.

Type of Pill Testing. Participants were presented with three scenarios in which ecstasy use could occur. Each scenario differed in terms of the type of pill testing available: (1) the current legal context in which no pill testing services are available, but portable reagent test kits of poor reliability can be legally obtained; (2) a hypothetical scenario in which onsite (i.e., within the festival grounds) pill testing services are available at festivals; and (3) a hypothetical scenario in which fixed site pill testing services are available within the community, but not within the festival grounds.

Intention to Use Ecstasy. Participants who had never previously used ecstasy rated their intention to use ecstasy by answering a single item measure “I intend to use ecstasy at a music festival”. They answered this question for each of the three scenarios regarding Type of Pill Testing. Participants who had ever used ecstasy rated their intention to increase ecstasy use by answering a single item for each pill testing scenario; (1) “If I obtain a reagent test kit then it is likely that I would consume more ecstasy than I intended”; (2) “If onsite pill testing was available at a festival, it is likely that I would consume more ecstasy than I had intended” and; (3) “If a fixed-site pill testing/checking laboratory was available, it is likely that I would consume more ecstasy than I had intended”.

Participants who had previously used ecstasy rated their intention to use an onsite pill testing service with a single item DV “If onsite pill testing was available at a festival, I would
intend to test/check the content of my ecstasy before I consume it”. Single item IV’s included; Attitudes “onsite pill testing/checking is not important to me”; Subjective Norms “If onsite pill testing/checking was available most of my friends would test/check the contents of their ecstasy before they consume it”; and Perceived Behavioural Control, “If onsite pill testing/checking was available, whether or not I use ecstasy is entirely up to me”. Sample characteristics gender and education level were included.

Participants who had previously used ecstasy rated their intention to use a fixed site pill testing service with a single item DV “If a fixed site pill testing/checking laboratory was available, I would intend to check the contents of my ecstasy before I consume it”. Single item IV’s included; Attitudes “Having access to a fixed site pill testing/checking laboratory before I use ecstasy is important to me”; Subjective Norms, “Most people whose opinions I value would approve of me using a fixed site pill testing service”; and Perceived Behavioural Control, “Whether or not I use a fixed site pill testing/checking laboratory is entirely up to me”.

**Procedures**

Following approval from the university’s School of Arts and Humanities Human Research Ethics sub-committee, and as per the Qualtrics flow-chart (Appendix A) all suitable participants were provided with the Participant Information Statement and Informed Consent Form. After prospective participants verbally acknowledged to myself or my supervisor that they understood what their participation in the research involved, and provided verbal consent to participate, they were asked to click the Next button on the survey. In doing so, participants provided further implicit consent to partake in the research.

All responses were collected in the field via mobile phone and iPad devices through the Qualtrics platform (Qualtrics, 2018) in their Offline Survey App. All participants who participated in the survey completed the Substance Use History, Ecstasy Use History and
Demographics Questionnaires. Only participants who reported having used ecstasy were diverted to the Ecstasy Related Harm Reductions Strategies Frequency Questionnaire.

Participants who reported never having used ecstasy were diverted to each of the pill testing vignettes and completed the questions in each scenario (Appendix, F to G). Participants who reported past ecstasy use were diverted to the pill testing vignettes (modified to suit past ecstasy consumption) and completed the questions in each scenario (Appendix, I, to K). All TPB components were presented in random order to reduce consistency bias and demand characteristics. After completing the survey all participants were diverted to the Demographics Questionnaire and exited from the survey.

Participants were given the option to take the Available Support pamphlet (Appendix M) to prevent, minimise or manage the potential risks identified for this research project. Participants were also encouraged to ask any questions pertaining to the survey. Survey responses were uploaded into Qualtrics at the end of each day when internet access was available.

Results

Statistics and data analysis

All non-identifiable data were supplied by Qualtrics and electronically/digitally stored under password protection for analysis. All data were downloaded from the Qualtrics platform and imported into SPSS. All analyses were conducted with SPSS (Version 25).

Hypothesis 1. To test my first hypothesis, a one-way repeated measures ANOVA was performed to test whether or not there were any differences in mean scores of Intention (DV) to use ecstasy in participants ($n = 35$) who had never used ecstasy across the three test scenarios; (1) reagent, ($M = 2.29, SD = 1.96$); (2) onsite, ($M = 2.54, SD = 1.97$); and (3) fixed site, ($M = 2.70, SD = 1.93$). Shapiro-Wilk statistics and boxplots indicated that the
assumption of normality was supported; $F_{\text{max}}$ was 1.381, and Mauchly’s test indicated that the assumption of sphericity was not violated (Field, 2013).

The results of the ANOVA indicated that there was no significant difference between the mean scores of Intentions, $F(2, 68) = 1.69, p > .05$, partial $\eta^2 = .05$. This effect size is considered very small (Cohen, 1988). Given that the $p$ value is higher than .05, I failed to reject the null hypothesis. See Figure 3, 4 and 5 for a graphical representation of the total count of participant responses in each pill testing scenario.

**Figure 3.**

![Colum graph showing total count of participant responses for reagent pill testing ($n = 35$).](image1)

**Figure 4.**

![Colum graph showing total count of participant responses for onsite pill testing service.](image2)
Figure 4. Column graph showing total count of participant responses for onsite pill testing \((n = 35)\).

Figure 5. Column graph showing total count of participant responses for fixed site pill testing \((n = 35)\).

**Hypothesis 2.** The assumptions for a one-way repeated measures ANOVA were not met for this hypothesis, as they require approximately normally distributed data, and homogeneity of variance across groups (Allen, Bennett, & Heritage, 2014). Visual examination of the histograms suggested violations of normality. Skewness values indicated that all three pill testing scenarios were positively skewed. While Kurtosis values were within the acceptable range, Kolmogorov-Smirnov statistics were significant for all conditions, suggesting that the data violated the assumptions of normality. A reflect square root data transformation was conducted (Tabachnick & Fidell, 2013), and there were only minimal improvements in skewness. All three conditions remained significant for Kolmogorov-Smirnov. Due to the lack of appreciable improvement in normality statistics, the untransformed data was retained for this hypothesis and the nonparametric equivalent to the one-way repeated measures ANOVA was chosen.

To test my second hypothesis, I conducted a Friedman’s test to compare mean scores of Intention (DV) to increase ecstasy use in participants \((n = 212)\) who had *ever* used ecstasy,
across the three test scenarios; (1) reagent, ($M = 2.61, SD = 1.84$); (2) onsite, ($M = 2.36, SD = 1.75$); and (3) fixed site, ($M = 2.60, SD = 1.85$). The results indicated that there was no significant difference between the mean scores of Intentions, $\chi^2(2) = 4.51, p > .05$. Based on the statistically non-significant evidence obtained by the $p$-value, I failed to reject the null hypothesis. See Figure 6, 7 and 8 for a graphical representation of the total count of participant responses in each pill testing scenario.

Figure 6. Column graph showing total count of participant responses for reagent pill testing ($n = 212$).

Figure 7. Column graph showing total count of participant responses for onsite pill testing ($n = 212$).

Figure 8.
Multiple regression analysis. Multiple linear regression applying the backward step-wise elimination method was employed for hypothesis three and four (see Table 2 for all results). Prior to interpreting the results, several assumptions were evaluated. Inspection of histograms, stem-and-leaf plots and boxplots indicated that each variable in the regression was normally distributed. An inspection of the normal probability plot of standardised residuals as well as the scatterplot of standardised residuals against standardised predicted values indicated that the assumptions of normality, linearity and homoscedasticity of residuals were met. Mahalanobis distance did not exceed the critical $x^2$ for $df = 8$ (at $a = .001$) of 1.17 for any cases in the data file, indicating that multivariate outliers were not of concern. High tolerances for all predictor variables in the regression model indicated that multicollinearity would not interfere with my ability to interpret the outcome of analyses (Field, 2013).

Interaction variables. Previous literature on the TPB has noted that the theory fails to account for potential interactions between the model’s components. Therefore, interaction variables were created for hypothesis three and four. Moderation (interaction) is shown by a significant interaction after controlling for first-order variables and interactive terms. It is essential to control for multicollinearity so interpretation of the interaction is clear. Howell
(2013) suggests a centring methodology, which involves subtracting the sample mean of a variable from the variable, to give deviation scores equal to zero. The centred variables are then multiplied to create interactive terms. Attitude, subjective norms and perceived behavioural control were multiplied to create three two-way interaction terms (attitude x subjective norms, attitude x perceived behavioural control, subjective norms x perceived behavioural control). Centring the first-order variables and the interactive terms created bivariate correlations that did not exceed .64. Multicollinearity problems usually occur when correlations are higher than .90 (Howell, 2013).

Hypothesis 3. For my third hypothesis, I examined whether attitudes, subjective norms and perceived behavioural control among participants (n = 212) who had ever used ecstasy would predict their intention to use an onsite pill testing service. Attitude (M = 2.98, SD = 2.17), Subjective norms (M = 5.77, SD = 1.45), perceived behavioural control (M = 6.59, SD = .94), the interaction terms, Attitude x Subjective norms, Attitude x perceived behavioural control, Subjective norms x perceived behavioural control, gender (M = 1.50, SD = .54), and education (M = 3.23, SD = 1.11) were regressed on Intention.

The overall model explained 44% of the unique variance in Intention, \( R^2 = .436 \), adjusted \( R^2 = .414 \), \( F(8, 203) = 19.64, p < .001 \) (all results displayed in Table 2). From step 1 to step 8 the backward step-wise regression method eliminated these variables consecutively: gender; education; Attitudes x Subjective Norms; Perceived Behavioural Control; Attitudes x Perceived Behavioural Control; Subjective norms x Perceived Behavioural Control; and Attitudes. The procedure stopped at step 8 leaving the best model which was Subjective norms (\( B = .64, p < .001 \), \( R^2 = .432 \), adjusted \( R^2 = .429 \), \( F(1, 210) = 159.41, p < .001 \). Subjective norms explained 43.2% of the overall variance in intention, which was only 0.4% less than the overall model. Attitudes made up the extra variance however, it was not significant.
Consistent with my hypothesis and previous findings (Johnston & White, 2003), subjective norms were a strong and independent predictor of intention to use an onsite pill testing service. However, attitude and perceived behavioural control did not independently predict intention which was contrary to my hypothesis.

**Hypothesis 4.** For my fourth hypothesis, I examined whether attitudes, subjective norms and perceived behavioural control among participants \( n = 212 \) who had ever used ecstasy would predict their Intention to use a fixed site pill testing service. Attitudes, Subjective Norms, Perceived Behavioural Control, and the interaction terms, Attitudes x Subjective norms, Attitudes x Perceived Behavioural Control, Subjective norms x Perceived Behavioural Control, gender, and education were regressed on Intention. Overall, the model explained 58% of the unique variance in Intention, \( R^2 = 0.576 \), adjusted \( R^2 = .560 \), \( F (8, 203) = 34.50, p < .001 \) (see Table 2 for detailed results). Consistent with the TPB model and my hypothesis, Attitudes (\( B = .43, p < .001 \)), Subjective Norms (\( B = .30, p < .001 \)) and Perceived Behavioural Control (\( B = .17, p < .05 \)) were all significant and independent predictors of Intention to use a fixed site pill testing service.

From step 1 to step 2 the backward step-wise regression method eliminated Attitudes x Subjective Norms. The procedure stopped at step 2 and this was selected as the best model. The most influential TPB components in subsequent order were: Attitude, Subjective Norms, Subjective Norms x Perceived Behavioural Control, Perceived Behavioural Control x Attitudes, and Perceived Behavioural Control. The interaction variables, Attitudes x Perceived Behavioural Control and Subjective Norms x Perceived Behavioural Control added an additional 4% variance to the overall model. Education was a marginally better predictor of intention to use a fixed site pill testing service than Perceived Behavioural Control. For a fixed site pill testing service, the interaction effects between the TPB components and sample
characteristics make an independent and significant contribution to the prediction of intention to use this type of service.

Table 2

*Summary of Backward Linear Multiple Regression Analyses Assessing Associations of Theory of Planned Behaviour Variables and Their Ability to Predict Intention to Use an Onsite and Fixed Site Pill Testing Service.*

<table>
<thead>
<tr>
<th>DV</th>
<th>IV</th>
<th>B</th>
<th>β</th>
<th>t-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intention to use onsite pill testing service</td>
<td>Step 1a</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gender</td>
<td>.005</td>
<td>-.002</td>
<td>-.971</td>
<td></td>
</tr>
<tr>
<td>Education level</td>
<td>-.004</td>
<td>-.003</td>
<td>.148</td>
<td></td>
</tr>
<tr>
<td>Attitudes</td>
<td>-.032</td>
<td>-.050</td>
<td>-.929</td>
<td></td>
</tr>
<tr>
<td>Subjective norms</td>
<td>.594</td>
<td>.624</td>
<td>11.56***</td>
<td></td>
</tr>
<tr>
<td>PBC</td>
<td>.026</td>
<td>.018</td>
<td>.335</td>
<td></td>
</tr>
<tr>
<td>Attitudes x PBC</td>
<td>-.023</td>
<td>-.031</td>
<td>-.512</td>
<td></td>
</tr>
<tr>
<td>Attitudes x Subjective norms</td>
<td>.001</td>
<td>.001</td>
<td>.025</td>
<td></td>
</tr>
<tr>
<td>Subjective norms x PBC</td>
<td>-.026</td>
<td>-.034</td>
<td>-.574</td>
<td></td>
</tr>
<tr>
<td>Step 2</td>
<td>Education level</td>
<td>-.004</td>
<td>-.003</td>
<td>-.059</td>
</tr>
<tr>
<td>Attitudes</td>
<td>-.032</td>
<td>-.050</td>
<td>-.938</td>
<td></td>
</tr>
<tr>
<td>Subjective Norms</td>
<td>.593</td>
<td>.642</td>
<td>11.64***</td>
<td></td>
</tr>
<tr>
<td>PBC</td>
<td>.026</td>
<td>.019</td>
<td>.337</td>
<td></td>
</tr>
<tr>
<td>Attitude x PBC</td>
<td>-.023</td>
<td>-.031</td>
<td>-.516</td>
<td></td>
</tr>
<tr>
<td>Attitudes x Subjective norms</td>
<td>.001</td>
<td>.001</td>
<td>.025</td>
<td></td>
</tr>
<tr>
<td>Subjective norms x PBC</td>
<td>-.026</td>
<td>-.034</td>
<td>-.576</td>
<td></td>
</tr>
<tr>
<td>Step 3</td>
<td>Attitudes</td>
<td>-.032</td>
<td>-.050</td>
<td>-.940</td>
</tr>
<tr>
<td>Subjective norms</td>
<td>.593</td>
<td>.642</td>
<td>11.67***</td>
<td></td>
</tr>
<tr>
<td>PBC</td>
<td>.026</td>
<td>.019</td>
<td>.338</td>
<td></td>
</tr>
<tr>
<td>Attitudes x PBC</td>
<td>-.024</td>
<td>-.031</td>
<td>-.528</td>
<td></td>
</tr>
<tr>
<td>Attitudes x Subjective norms</td>
<td>.001</td>
<td>.001</td>
<td>.025</td>
<td></td>
</tr>
<tr>
<td>Subjective norms x PBC</td>
<td>-.026</td>
<td>-.034</td>
<td>-.577</td>
<td></td>
</tr>
<tr>
<td>Step 4</td>
<td>Attitudes</td>
<td>-.034</td>
<td>-.053</td>
<td>-.995</td>
</tr>
<tr>
<td>Subjective norms</td>
<td>.598</td>
<td>.647</td>
<td>12.20***</td>
<td></td>
</tr>
<tr>
<td>PBC</td>
<td>.027</td>
<td>.019</td>
<td>.295</td>
<td></td>
</tr>
<tr>
<td>Attitudes x PBC</td>
<td>-.018</td>
<td>-.024</td>
<td>-.457</td>
<td></td>
</tr>
<tr>
<td>Subjective norms x PBC</td>
<td>-.026</td>
<td>-.035</td>
<td>-.588</td>
<td></td>
</tr>
<tr>
<td>Step 5</td>
<td>Attitudes</td>
<td>-.033</td>
<td>-.052</td>
<td>-.975</td>
</tr>
<tr>
<td>Subjective norms</td>
<td>.607</td>
<td>.657</td>
<td>12.63***</td>
<td></td>
</tr>
<tr>
<td>Attitudes x PBC</td>
<td>-.018</td>
<td>-.024</td>
<td>-.457</td>
<td></td>
</tr>
<tr>
<td>Subjective norms x PBC</td>
<td>-.030</td>
<td>-.041</td>
<td>-.744</td>
<td></td>
</tr>
</tbody>
</table>

**Step 6**

| Attitudes | -.034 | -.053 | -1.003 |
| Subjective norms | .588 | .636 | 11.51*** |
| Subjective norms x PBC | -.028 | -.038 | -.695 |

**Step 7**

| Attitudes | -.034 | -.053 | -.995 |
| Subjective norms | .598 | .647 | 12.20*** |

**Step 8**

Subjective norms | .607 | .657 | 12.62*** |

**Intention to use fixed site pill testing service**

**Step 1a**

| Gender | -.295 | -.118 | -2.43* |
| Education level | .166 | .137 | 2.83** |
| Attitudes | .378 | .403 | 7.32*** |
| Subjective norms | .324 | .334 | 6.26*** |
| PBC | .179 | .144 | 2.60** |
| Attitudes x PBC | .104 | .182 | 2.90** |
| Attitudes x subjective norms | -.031 | -.041 | .450 |
| Subjective norms x PBC | -.119 | -.154 | -2.45** |

**Step 2**

| Gender | -.260 | -.104 | -2.22* |
| Education level | .152 | .125 | 2.71** |
| Attitudes | .402 | .429 | 8.10*** |
| Subjective norms | .296 | .305 | 5.91*** |
| PBC | .210 | .169 | 2.18** |
| Attitudes x PBC | .100 | .175 | 2.82** |
| Subjective norms x PBC | -.136 | -.176 | -3.22*** |

**Note.** ***p<.001, **p<.01, *p<.05 (2-tailed). (n = 212).**

*TPB items used the following 7-point Likert-type scale: 1 = Strongly disagree, 2 = Moderately disagree, 3 = Slightly disagree, 4 = Neither disagree nor agree, 5 = Slightly agree, 6 = Moderately agree, 7 = Strongly agree.

Abbreviations: DV = Dependent Variable; IV = Independent Variable; PBC = Perceived Behavioural Control.

**Discussion**

I found that a pill testing service is not likely to influence an individual’s intention to use ecstasy for the first time or increase intended use for an individual who has used ecstasy in the past. I also found that the combination of attitudes, subjective norms, perceived behavioural control, interaction variables, gender and education level predicted intention to
use a fixed site pill testing service, while only subjective norms predicted intention to use an onsite service. This finding provides some additional support for the TPB, though demonstrates the importance of considering interaction variables within the model. These results are the first portrayal of reported intentions and ecstasy use in Australia. Nonetheless, the relationship between intentions and actual behaviour were not evaluated in this study.

**Intention to initiate or increase ecstasy use**

A common criticism by opponents of pill testing in Australia is that it will ‘send the wrong message’ and increase illicit drug use (Preiss & Carey, 2019). My results indicate that for both ecstasy-naïve and ecstasy-initiated individuals, a pill testing service is unlikely to increase an individual’s intention to use ecstasy. My study is one of several studies that have examined the relationship between ecstasy consumption and a pill testing service. Consistent with my results, Hungerbuehler et al. (2011) found that a pill testing service did not increase the reported consumption of illicit party drugs such as ecstasy, or increase intended frequency of use. Benschop et al. (2003) applied a cross-sectional design and found that the participants who used a pill testing service did not report more frequent or increased drug use compared to participants who did not use the service. Additionally, the authors found that pill testing services led to delayed first time ecstasy use in some non-users due to knowledge acquired through the service that had reinforced participants’ fears and reservations about ecstasy use.

Ecstasy was reported as the second highest consumed drug after alcohol among the participants in my study. Compared to a sample of festival attendees from an earlier study in Western Australia (Hollett & Gately, 2019), the rate of ecstasy use in my sample is high (although the average age of my sample is a few years older). While there was a large difference in the number of participants in each hypothesis, the results were similar with regards to their intentions. For both ecstasy-initiated and ecstasy-naïve participants, the modal response on intention to initiate or increase use was ‘strongly disagree’ (see Figure 3
to 8 for detailed results). This result corresponds with Hollett and Gately (2019) who found that all festival attendees (both MDMA naïve and initiated) would reduce their risk intention rather than increase it when presented with three hypothetical pill test results. Benschop et al. (2003) found that both ecstasy-naïve and ecstasy-initiated participants did not report increased intention to engage in ecstasy use when a pill testing service was available.

Factors that influence an individual’s intention to initiate or increase ecstasy use may include but are not limited to: personality, peer influence, opportunity, the setting, and life events. To fully understand these dynamics and what motivates a person to use a pill testing service, a thorough longitudinal study would be required. This would allow for a more comprehensive exploration of individual behaviour and uncover existing cause and effect relationships. Nevertheless, my results indicate that a pill testing service is unlikely to influence intention to initiate or increase ecstasy use.

Currently, messages about drug use broadly focus on drug-related harms. This primary prevention message (primary prevention aims to discourage people from taking any psychoactive substance, particularly first-time use [WHO, 2001]) might be perceived with scepticism from people who have had a ‘good experience’ with drugs such as ecstasy. This can be counterproductive to prevention strategies as previous research has found that age-group peers who have had experience with ecstasy consumption form an important source of information for ecstasy naïve peers (Benschop et al., 2003). In order to optimise prevention strategies, a pill testing service can apply a combination of both primary and secondary prevention messages (secondary prevention targets people who already consume psychoactive substances [WHO, 2001]). These messages might have more impact if they focus on differential variations within groups of people and the processes that occur within these groups. Distinguishing target groups by users and non-users is a largely artificial strategy, as assumptions can be made about each group’s existing knowledge. For example,
Hollett and Gately (2019) found that people with past MDMA use and people with no MDMA use did not differ in their estimate of a ‘safe’ dose of MDMA, or in their understanding of potentially dangerous NPS such as PMMA.

Since age-group peers who have had experience with ecstasy consumption often form an important source of information for other ecstasy curious peers (Benschop et al., 2003); their existing knowledge (or lack of) is an important consideration for future health promotion. The majority of participants in my study who reported past ecstasy use described numerous harm reduction strategies they had implemented before consumption (see Appendix N). These findings suggest that further detailed information about the contents of their ecstasy and psychoeducation on the risks of drug harm would not be lost on this cohort, and only add to the personal safety measures that people are already implementing. In support of this, and as previously mentioned, Hollett and Gately (2019) found that other features of a pill testing services such as psychoeducation and referrals to further support services are likely to be crucial elements of harm reduction objectives.

**Intention to use a pill testing service**

The goal of my third and fourth hypotheses was to test the predictive power of the TPB regarding intentions to use an onsite and fixed site pill testing service among people who had ever consumed ecstasy. Results for the onsite pill testing service revealed that subjective norms were the only significant predictor of intention, explaining 43% of the unique variance. Compared to other studies this percentage is high (McEachan, et al., 2011). Attitudes was the only other variable that contributed to the variance in this analysis, but the contribution was negligible. In contrast, for a fixed site service all of the TPB variables including the sample demographics (gender and education level) were significant predictors of intention, explaining 58% of the overall variance. Attitudes were the strongest predictor of intention explaining 43% of the unique variance, and subjective norms were the second
strongest predictor, explaining 30% of the variance. Significant moderator effects were found for a fixed site service only, with attitudes x perceived behavioural control and subjective norms x perceived behavioural control both contributing to the overall variance. While all three TPB variables predicted intention for a fixed site pill testing service, that was not the case for an onsite service.

Although numerous studies examining the TPB have found subjective norms to be the weakest predictor of intention to engage in a given behaviour (McEachan, et al., 2011), my results indicate that subjective norms were the only TPB variable uniquely associated with intention to use an onsite pill testing service. This finding suggests that when an ecstasy consumer is at a festival that provides onsite pill testing, his or her decision to use that service will be significantly influenced by their social networks and their perception about whether those people support using the service. Furthermore, these influences are so persuasive in this setting that they override other components of the TPB. My results are consistent with Norman and Conner (2006) who found that the norms of a behaviourally relevant social group predicted intention to engage in binge drinking behaviour, especially for the participants who showed a stronger affiliation to the reference group. McMillan and Conner (2003) found that while attitudes and perceived behavioural control were significant predictors of intention to use alcohol and tobacco, subjective norms added to the prediction of intention over and above the other TPB variables.

It is often speculated that adolescents and younger adults are regularly driven by less rational thought processes and more by affective processes (such as peer pressure) compared to adults (Gibbons, Houlihan, & Gerrard, 2009). In support of this hypothesis, McEachan, et al. (2011) found that subjective norms were a better predictor of intentions for adolescent samples. However, the mean average age of my sample was 29-years-old. This suggests that the connection between a pill testing service and perceived social norms is the most salient
feature when predicting intention to use an onsite service. Within SIT, the social
categorisation of groups is conceptualised as a process where people possess numerous social
identities. These identities are derived from certain social groups which people identify with,
for a sense of belonging and security (Tajfel & Turner, 2010). In an environment such as a
music festival where drug use is considered a social norm, there might be a stronger
identification to the behaviours of these group norms. Consequently, personal attributes such
as attitudes and perceived control will not be as influential when making the decision to use
an onsite pill testing service. Hynes and Zinkiewicz (2007) propose that harm reduction
initiatives need to target particular groups of party drug consumers, especially when the
consumers share a clear social identity. As such, effective harm reduction strategies can
incorporate both the social context where drug consumption occurs and the social norms
within that group of drug consumers.

In contrast, a fixed site service is within the context of the larger community of
ecstasy consumers and therefore, self-autonomy and broader psychological determinants of
behaviour such as attitudes and perceived control, will be more influential when making
decisions about intended ecstasy use. It makes sense that the TPB components predicted
intention more evenly in this scenario as the person has to engage in a deliberate chain of
behaviours to arrive at a fixed site service. I found that all three TPB variables (attitudes,
subjective norms and perceived behavioural control) were strong predictors of intention to
use a fixed site pill testing service. This suggests that away from a setting where group
identity is more relevant, intention is more strongly influenced by personal attributes such as
attitudes (as hypothesised by Ajzen, 2011). These findings are consistent with other studies
that have used the TPB to predict certain behaviour. For example, Davis and Rosenberg
(2016) found that attitudes, subjective norms and perceived behavioural control were all
significant predictors of intention to use a pill testing kit. Although, in contrast to the
predictive strength of the components found in my study, the authors found that perceived
behavioural control was the strongest predictor of intention. Kim and Hong (2013) found that
all three TPB variables were significant predictors of the intention to control dangerous levels
of alcohol consumption among South Korean workers. The authors found that perceived
behavioural control was the strongest predictor of intention to control their drinking over a
two-week period. Moan (2013) found that among Norwegian women, all three TPB variables
significantly predicted the intention not to enter a car with an intoxicated driver at the wheel.
Perceived behavioural control was the strongest predictor of intention.

Since the initial proposal of moderating effects between the core components of the
TPB (Eagly & Chaiken, 1993) numerous studies have found potential interactions within the
model (Hukkelberg et al., 2014; McEachan, et al., 2011). Therefore, my search for interaction
effects between the TBP variables was justified, as both risk and health behaviours have been
shown to moderate these relationships. While my findings did not show any interaction
effects for an onsite service, they did show significant effects for a fixed site service. The
interaction of attitudes x perceived behavioural control, and subjective norms x perceived
behavioural control were both slightly stronger predictors of intention to use a fixed site
service than the perceived behavioural control variable on its own. Consistent with my
findings, Umeh and Patel (2004) explored interaction effects and found that as attitudes
towards ecstasy use were more positive, perceived behavioural control was a better predictor
of intended use. My findings suggest that perceived behavioural control may be moderated, at
least in part, by an individual’s attitude towards using a fixed site service, and how this
behaviour is perceived by important others. It would be valuable to demonstrate more clearly
that context affects beliefs by obtaining behavioural, attitudinal, normative and control beliefs
in the different context of each pill testing service.
In addition to behavioural interactions, sample characteristics were also found to be significant moderators in my study for a fixed site service. While gender was a significant predictor it was the lowest contributor. In contrast, education level was a slightly stronger predictor of intention than perceived behavioural control. This finding is somewhat surprising, as perceived behavioural control is repeatedly found to be a strong and independent predictor of intention in many studies (Davis & Rosenberg, 2016; Kim & Hong, 2013; Moan, 2016). However, my findings are consistent with Albarracin et al. (2004) who conducted a meta-analysis observing the predictive power of the TPB and influences of social power and normative support on condom use. The authors found that individuals with higher education levels had stronger associations between subjective norms and intention. It is noteworthy that subjective norms have been an influential variable in both pill testing scenarios in my study, and the majority of participants reported having obtained a bachelor’s degree or higher. Overall, my findings support Ajzen’s (2011) view that the strength of the associations between the TPB components and intention to engage in a given behaviour do vary within the specific population and context of the behaviour under investigation.

To use a fixed site service a person must go to the place where ecstasy can be purchased and then find out where the fixed site testing service is, and travel to the site and have it tested. That constitutes a series of deliberate planned behaviours. It is unsurprising that all components within the TPB are associated with the strength of intention to employ that chain of behaviours. On the other hand, using an onsite pill testing service when at a festival with a group of friends involves a simple decision, possibly a group decision, to use it or not, so it makes sense that one’s perception of social norms has such a strong association with intention to use onsite testing, so much so that no other TPB components enter the regression. The implications of my results for the TPB suggest that it works well with a chain of planned behaviour, but not as well with a behaviour that is likely to be more influenced by
situational and personality factors. This is consistent with findings from Butler and Montgomery (2004) who investigated characteristics of recreational ecstasy consumers in an undergraduate cohort. The authors found that high ecstasy users had higher levels of impulsivity, novelty seeking and risk-taking behaviour.

My findings are important as they indicate that both onsite and fixed site pill testing services offer a unique opportunity to provide health promotion within environments that have different antecedents of ecstasy-related behaviour. When developing interventions aimed at encouraging the adaption of behaviour change, strategies should be centred around creating positive social norms within specific referent groups, particularly to motivate the use of an onsite pill testing service. In turn, this could strengthen personal autonomy by increasing the power of personal attitudes and perceived control towards intentions to engage in health seeking behaviour within the festival grounds before, during or after consuming ecstasy. An onsite service might benefit from implementing peer-based models that target particular referent groups. Within the context of harm reduction, peer-based models are community-based initiatives that involve persons with equal standing in the community who share a similar lived experience and offer non-judgemental support and psychoeducation to other peers (Ritter et al., 2013). This strategy is often perceived as a trusted source of information (Benschop et al., 2003).

**Study limitations and future directions**

While a considerable strength of this study is that data collection took place within the festival grounds where a pill testing service would likely be operating, there were four methodological problems that could limit the efficacy of my findings that need to be considered. First, the scenarios were of a hypothetical nature. Concerns have been raised about the validity of findings and the conclusions that can be drawn from them because there is no measure of actual behaviour. Further, what people say they intend to do when provided
a hypothetical scenario and what they actually do in a real-life scenario might differ. However, available evidence addressing methodological issues of vignettes suggests that participants respond to hypothetical and real-life scenarios in a similar fashion (Evans et al., 2015). Further, evidence supports the use of vignettes to provide a perspective that is often unable to be obtained through alternative methods (Evans et al., 2015). Currently most research concerning pill testing in Australia will be of a hypothetical nature, and therefore every effort was taken to ensure I had the most valid measure. Vignettes can overcome several validity issues by deriving the questionnaire from existing literature, following a narrative, presenting a similar structure throughout and covering all pertinent variables (Evans et al., 2015). I applied all of these recommendations in my study.

Second, the measures of intention were based on self-reported data which may bias results. Due to the sensitive nature of my study, the participants may have responded in a socially desirable manner, exaggerated responses or have been too embarrassed to reveal their responses. While it is almost unavoidable to apply self-report measures when collecting data on psychological constructs, it would be valuable for any future research endeavours in Australia to collect objective measures of actual behaviour before and after a pill testing intervention. This would allow researchers to examine how intentions influence actual behaviour and also how the TPB components are able to predict this type of behavioural measure; as shown by Measham (2019).

Third, while the TPB components were presented in random order in each scenario to reduce consistency bias, it is likely that participants could have been affected by demand characteristics. My supervisor and I may have unintentionally provided participants with visual cues (a smile, a nod of the head) regarding appropriate responses. Furthermore, as the questions concerned pill testing and the study was conducted at a music festival, the
participants may have been prone to ‘help’ us by trying to guess and then confirm my hypotheses.

Finally, this research took place in a setting where participants were likely to be exposed to alcohol and other drugs. Participants under the influence of a psychoactive substance may compromise the validity of consent, as intoxication can impair cognitive function and judgement. It is essential for a participant to understand what the research involves so they can make an informed decision about their participation. While no participant was unduly intoxicated and every care was taken to make sure that each participant understood the information being presented to them, some of the participants who took part in my survey did mention that they had been drinking alcohol or had consumed other drugs the day they completed the survey.

My findings highlight some potential areas for future research. A new development within TPB research has seen an incorporation of the application of SIT. Future studies that incorporate aspects of social identity could examine the intention to initiate or increase ecstasy use within music festival grounds and the wider community, particularly in relation to the salience of in-groups and group norms, and how decisions are made within this context. This would be beneficial to clarify the role of peer influence in decision making within particular referent groups. In direct relation to the TPB, the role of subjective norms in predicting intention to use a pill testing service should be further examined to determine whether the significance of subjective norms was specific to my study and/or the types of pill testing services examined. Such research would clarify the role subjective norms play within the TPB. It would be useful to apply a direct comparison between SIT and an individual differences approach to the explanations derived from this study and previous research regarding the inconsistent predictive ability of subjective norms.

Conclusion
My findings have two important implications for the advocacy of sanctioned pill testing in Australia. First, the findings demonstrate that a pill testing service is unlikely to initiate ecstasy use among people who have never consumed ecstasy or increase intended use among people who have used ecstasy on at least one occasion. Second, the findings demonstrate that the TPB is a useful conceptual framework for measuring intention to engage with a pill testing service within festival grounds and the wider community. The strength of the associations between the TPB components and intention to engage with a pill testing service vary, dependent upon the service location. My preliminary findings are important as they suggest that both an onsite and fixed site pill testing service offer a unique opportunity to provide health promotion within environments that have different antecedents of ecstasy-related behaviour. By identifying intentions and establishing links to relevant determinants of behaviour within particular settings, a pill testing service has the potential to focus on the individual needs of a drug consumer to reduce ecstasy-related harm. A harm reduction service that empowers people to make informed decisions about their own health might ultimately send the right message: If you are going to use, then minimise the risks as much as you can.
References


Albarracin, D., Kumkale, G., & Johnson, B. (2004). Influences of social power and normative support on condom use decisions: a research synthesis. Aids Care, 16(6), 700-723.


Bright, S. (2019, January 9). While law makers squabble over pill testing, people should test their drugs at home. Retrieved from https://theconversation.com/while-law-makers-squabble-over-pill-testing-people-should-test-their-drugs-at-home-109421


https://doi.org/10.1037/adb0000167


Hollett, R. C., & Gately, N. (2019). Risk intentions following pill test scenarios are predicted by MDMA use history and sensation seeking: a quantitative field study at an Australian music festival. *Drug and Alcohol Review.*


https://doi.org/10.1080/0887044021000037835


doi:10.1080/17437199.2010.521684


Appendix A

Qualtrics flow-chart
Appendix B

Pill Testing at Music Festivals

Participant Information Statement and Informed Consent

Welcome!

Researchers at Edith Cowan University in Western Australia are conducting an exploratory study into the influence pill testing has on people who attend music festivals.

Chief investigator: Sherri Murphy (BPsychSc)

Supervising Researchers: Dr G. Dear and Dr S. Bright.

What are we trying to learn? The aim of this study is to better understand the influence pill testing has on ecstasy use and the ways that people who use ecstasy keep themselves safe.

Why? There is increasing media debate about pill testing and what impact it will have on people who attend festivals, yet there is little research regarding what effects it might have.

What do I have to do? Your participation will first involve answering questions about your substance use history within the past 12 months; whether you have used the following substances or none at all. Following this, you will be asked about your attitudes and beliefs regarding three different pill testing scenarios. You will then be asked some demographic information. I anticipate that your participation will take approximately 10 minutes. To be eligible to participate you must be 18 years or older.

Are there any Benefits? Participation will involve being provided with information on harm reduction. Your participation will also contribute to the development of knowledge in this important area of public health policy, as your views will form part of the international community's knowledge. Participation in this study will help our understanding of what factors influence the use of ecstasy. These results could provide useful information to help design future efforts to reduce harms from ecstasy. This data will be kept and stored securely at Edith Cowan University and may be used by other researchers for future projects.

Are there any risks involved? It is not likely that there will be any harm or discomfort associated with this survey. We are only asking about your recent drug use.

Confidentiality: While participation in this survey is confidential, there are limits to confidentiality. Please do not disclose any personal information that involves illegal activity,
the researchers have a moral duty to disclose to authorities information that involves violent crime or where there is a direct, foreseeable risk to your safety or others’ safety. We have no obligation to, or intention of, disclosing illegal activities related to obtaining or using illegal drugs. Should the researchers deem you do not have the capacity to make your own decisions or give consent, you will be excluded from participation in the survey. Upon informed consent you will then be asked to click the NEXT button to enter the survey.

**Eligibility to participate:** You are welcome and encouraged to participate if you are over 18 years old, are able to read and understand English and are not visibly intoxicated.

**What if I decide to withdraw?** Your participation is completely voluntary. You are free to change your mind and stop participating at any time, even if you begin to complete the online survey. You may click on the X at the top right-hand corner of your computer window to exit the survey at any time.

**Information about the study results:** We expect to have the study completed by October 2019. A summary of the results will be posted at (link TBA)

**Available Support:** If you want information or support or are worried about someone’s alcohol or other drug use please see the attached document ‘Available Support’ for some helplines and services available to you.

**Questions:** If you have any questions or need more information please speak with the person who is asking you to complete the survey. If you have any questions after you have completed the survey, please contact:

Sherri Murphy  
Email: [REDACTED]

**Research supervisor contact details**

Dr G. Dear  
Email: g.dear@ecu.edu.au  
Tel: (08) 6304 5834

Dr S. Bright  
Email: s.bright@ecu.edu.au  
Tel: (08) 6304 2597

This project is part of the course requirement for a Bachelor of Science (Psychology) Honours and has been reviewed by Edith Cowan University Human Research Ethics Sub-Committee. If you have any concerns about the way this research has been conducted or speak to somebody independent of the survey, please contact the ECU Senior Research Ethics Officer on (08) 6304 2170 or research.ethics@ecu.edu.au
Having read the above information I understand that by clicking Next I agree to take part under the terms and conditions outlined above. Clicking exit will close the survey and no data will have been recorded. The survey must be completed in one sitting. If you are not ready to complete the survey please let us know.
Appendix C

SUBSTANCE USE HISTORY QUESTIONNAIRE

In the past 12 months please indicate if you have used any of the following substances

Alcohol
Cannabis/Marijuana
Synthetic Cannabinoids/Kronic
Heroin
Painkillers
Cocaine
Benzodiazepines (e.g., xanax, valium)
Methamphetamine
Dexamphetamine/Ritalin
LSD
Mushrooms
Ayahuasca
DMT
Ketamine
GHB
Inhalants
Research chemicals
None
Appendix D

ECSTASY USE HISTORY QUESTIONNAIRE

1. How frequently do you use ecstasy?
   - Never
   - Less than monthly
   - Once per month
   - Every other week
   - Weekly
   - Twice per week
   - More than two times per week

2. How many times have you used ecstasy over the course or your lifetime?
   - 0, 1-10, 11-20, 21-30, 31-40, 41-50, 51-60, 61-70, 71-80, 81-90, 91-100, 100 or more

3. How many times have you used ecstasy in the past three months?
   - [Single numerical values between 1 and 24]
   - 25 or more

4. In which environment do you typically consume ecstasy?
   - Music Festival
   - Club
   - Rave
   - Home
   - Friend’s home
   - Other

5. When was the last time you consumed ecstasy?
   - I used MDMA/ecstasy earlier today
   - Yesterday
   - A few days ago
   - About a week ago
   - More than a week ago

6. Do you plan to consume MDMA/ecstasy at this festival?
   - Yes
   - No
Appendix E

ECSTASY-RELATED HARM REDUCTION STRATEGIES FREQUENCY QUESTIONNAIRE

Description provided to participants who DO use ecstasy:

“What percent of the time did you use the following harm reduction strategies while using MDMA/ecstasy over the past year?”

Participants are asked to provide a proportion of the time that they used a specific harm-reduction strategy from Never/0% of the time to Always/100% of the time (in increments of 10%).

1. I used a reagent test kit to check for the presence of ecstasy/MDMA and/or adulterants.
2. I checked an online ecstasy/MDMA testing services to see if the pill I was taking contained MDMA and/or adulterants.
3. Other [free text box to describe].
Appendix F

THEORY OF PLANNED BEHAVIOR VARIABLES – REAGENT TESTING/CHECKING

Scenario 1: Description provided to participants who do NOT consume ecstasy:

“There are currently reagent test kits that you can legally purchase from some stores and online. They can indicate presence of MDMA or other common 'ecstasy' substances, in addition to some dangerous chemicals that are often sold as 'ecstasy'. However, they are not very accurate and might not detect dangerous adulterants”.

Participants are asked to rate their agreement with each item on a 7-point scale from -3 =Strongly Disagree to +3=Strongly agree.

Attitudes (Higher scores = positive attitudes)

1. If I were to try ecstasy, using a reagent test kit would be important to me.
2. If I were to try ecstasy, a reagent test kit would be beneficial to me.

Subjective Norm (high scores = positive norms)

1. I believe that most people who are important to me think it would be ok if I used ecstasy.
2. Most of my friends would test/check the content of their pills before they use ecstasy using a reagent test kit.

Perceived Behavioral Control (higher scores = more control and confidence)

1. Whether or not I use ecstasy is entirely up to me.
2. I have a lot of control over whether I use ecstasy.

Intention (Higher scores = more intention)

1. If I obtain a reagent pill testing kit, it is likely that I would use ecstasy.
2. I intend to use ecstasy at a music festival.
Scenario 2: Description provided to participants who do NOT consume ecstasy:

“Onsite pill testing has been used overseas to check for the presence of MDMA or other common 'ecstasy' substances by a scientist or drug expert at festivals using mobile laboratory equipment. Such services provide relatively accurate information about the contents of ecstasy. They might be right 95 or 99% of the time. The results of the analysis are provided alongside education about the risks and harms of consumption.

Participants are asked to rate their agreement with each item on a 7-point scale from -3 =Strongly Disagree to +3=Strongly agree.

Attitudes (Higher scores = positive attitudes)

1. If I were to try ecstasy, it is important that onsite pill testing be provided by a festival.
2. If I were to try ecstasy, having access to onsite pill testing would be beneficial to me.

Subjective Norm (high scores = positive norms)

1. If onsite pill testing was available, generally speaking, I want to do what the police think I should do.
2. If onsite pill testing/checking was available most of my friends would check the contents of their pill/s before they use ecstasy.

Perceived Behavioral Control (higher scores = more control and confidence)

1. If onsite pill testing was available, whether or not I use ecstasy is entirely up to me.
2. If onsite pill testing was available I would feel safe using ecstasy.

Intention (Higher scores = more intention)

1. If onsite pill testing was available at a festival, it is likely that I would use ecstasy.
2. I intend to use ecstasy at a music festival.
Appendix H

THEORY OF PLANNED BEHAVIOR VARIABLES – FIXED-SITE PILL TESTING/CHECKING

Scenario 3: Description provided to participants who do NOT consume ecstasy:

“In some countries, there are fixed-site pill testing service to check for the presence of MDMA or other common 'ecstasy' substances by a scientist in laboratory. They are usually located in densely populated areas (e.g., Northbridge). They can provide the most reliable information about the quality and purity of the ecstasy.

Participants are asked to rate their agreement with each item on a 7-point scale from -3 = Strongly Disagree to +3 = Strongly agree.

Attitudes (Higher scores = positive attitudes)

1. Having access to a fixed-site pill testing/checking laboratory before I used ecstasy would be important to me.
2. If I were to try ecstasy, going to a fixed-site pill testing/checking laboratory would be worth the effort.

Subjective Norm (high scores = positive norms)

1. Most people whose opinions I value would approve of me using a fixed-site pill testing service.
2. If a fixed-site pill testing/checking laboratory was available, generally speaking, I want to do what the police think I should do.

Perceived Behavioral Control (higher scores = more control and confidence)

1. Whether or not I would use a fixed-site pill testing/checking laboratory is entirely up to me.
2. If onsite pill testing was available I would feel safe using ecstasy.

Intention (Higher scores = more intention)

1. If a fixed-site pill testing/checking laboratory were available, it is likely that I would use ecstasy.
2. I intend to use ecstasy at a music festival.
Appendix I

THEORY OF PLANNED BEHAVIOR VARIABLES – REAGENT PILL TESTING

Scenario 1: Description provided to participants who DO consume ecstasy:

“There are currently reagent test kits that you can legally purchase from some stores and online. They can indicate presence of MDMA or other common 'ecstasy' substances, in addition to some dangerous chemicals that are often sold as 'ecstasy'. However, they are not very accurate and might not detect dangerous adulterants”.

Participants are asked to rate their agreement with each item on a 7-point scale from -3 = Strongly Disagree to +3= Strongly agree.

Attitudes (Higher scores = positive attitudes)

1. Using a reagent test kit before I use ecstasy is important to me.
2. A reagent test kit is beneficial to me.

Subjective Norm (high scores = positive norms)

1. Most of my friends tell me that I should test/check the content of my ecstasy before I use it.
2. I believe that most people who are important to me think it is ok that I use ecstasy.

Perceived Behavioral Control (higher scores = more control and confidence)

1. I have a lot of control over whether I use ecstasy today.
2. Whether or not I use ecstasy is entirely up to me.

Intention (Higher scores = more intention)

1. It is likely that I would use ecstasy if I obtained a reagent pill testing kit.
2. I intend to use ecstasy at a music festival.
3. If I obtain a reagent test kit then it is likely that I would use more ecstasy than I intended.
Appendix J

THEORY OF PLANNED BEHAVIOR VARIABLES – ONSITE PILL TESTING/CHECKING

Scenario 2: Description provided to participants who DO consume ecstasy:

“Onsite Pill Testing has been used overseas. to check for the presence of MDMA or other common 'ecstasy' substances by a scientist or drug expert at festivals using mobile laboratory equipment. Such services provide relatively accurate information about the contents of ecstasy. They might be right 95 or 99% of the time. The results of the analysis are provided alongside education about the risks and harms of consumption.

Participants are asked to rate their agreement with each item on a 7-point scale from -3 =Strongly Disagree to +3=Strongly agree.

Attitudes (Higher scores = positive attitudes)

1. It is important that onsite pill testing be provided by a festival.
2. Onsite pill testing/checking is not important to me.

Subjective Norm (high scores = positive norms)

1. If onsite pill testing/checking was available, most of my friends would test/check the content of their ecstasy before they use it.
2. If onsite pill testing was available, generally speaking, I want to do what the police think I should do.

Perceived Behavioral Control (higher scores = more control and confidence)

1. If onsite pill testing was available, whether or not I use ecstasy is entirely up to me.
2. If onsite pill testing was available I would feel safe using ecstasy.

Intention (Higher scores = more intention)

1. If onsite pill testing was available at a festival, it is likely that I would consume more ecstasy than I had intended.
2. If onsite pill testing was available at a festival, I would intend to test/check the content of my ecstasy before I use it.
3. If onsite pill testing was available at a festival, I would use ecstasy.
Appendix K

THEORY OF PLANNED BEHAVIOR VARIABLES – FIXED-SITE PILL TESTING/CHECKING

Scenario 3: Description provided to participants who DO consume ecstasy:

“In some countries, there are fixed-site pill testing services to check for the presence of MDMA or other common 'ecstasy' substances by a scientist in laboratory. They are usually located in densely populated areas (e.g., Northbridge). They can provide the most reliable information about the quality and purity of the ecstasy.

Participants are asked to rate their agreement with each item on a 7-point scale from -3 =Strongly Disagree to +3=Strongly agree.

Attitudes (Higher scores = positive attitudes)

1. Having access to a fixed-site pill testing/checking laboratory before I use ecstasy is important to me.
2. Going to a fixed-site pill testing/checking laboratory before I use ecstasy is worth the effort.

Subjective Norm (high scores = positive norms)

1. If a fixed-site pill testing/checking laboratory was available, generally speaking, I want to do what the police think I should do.
2. Most people whose opinions I value would approve of me using a fixed-site pill testing service.

Perceived Behavioral Control (higher scores = more control and confidence)

1. Whether or not I would use a fixed-site pill testing/checking laboratory is entirely up to me.
2. If onsite pill testing was available I would feel safe using ecstasy

Intention (Higher scores = more intention)

1. If a fixed-site pill testing/checking laboratory was available, it is likely that I would consume more ecstasy than I had intended.
2. If a fixed-site pill testing/checking laboratory was available, I would intend to check the contents of my ecstasy before I use it.
3. If fixed-site pill testing/checking laboratory was available, I would use ecstasy at a festival.
Appendix L

DEMOGRAPHICS QUESTIONNAIRE

What is your age?
- 18-24
- 25-34
- 35-54
- 55-65
- Over 65

What is your gender?
- Male
- Female
- Other
- Decline to respond

What is your ethnicity?
- Asian/Pacific Islander
- Aboriginal/Torres Strait Islander
- Caucasian
- Other/Multi-Racial
- Decline to Respond

Which state do you live in?
- List of all Australian states

What level of education have you completed?
- 12th grade or less
- Graduated high school or equivalent
- College or Tafe
- Bachelor’s degree
- Master’s degree or higher

What is your relationship status?
- Single
- Married/Partnered
Appendix M

AVAILABLE SUPPORT

North Metro Community Drug and Alcohol Service (NMCADS)

This is an integrated service and in partnership with Cyrenian House and Next Step. The service provides individuals and families with access to a comprehensive range of alcohol and drug services from one location. People can refer themselves directly or can be referred by other services including mental health, corrective services, child protection and general practitioners.
This service acknowledges Aboriginal people as the traditional custodians of Western Australia and are welcoming of all Aboriginal peoples, families and communities.

Phone
Joondalup: (08) 9301 3200  Warwick: (08) 9246 6767

Alcohol and Drug Information Services (ADIS)

This is a confidential, 24 hour, 7 days a week telephone service which offers counselling, information, support and referral. ADIS is staffed by professional experienced drug and alcohol counsellors.
You can choose to contact ADIS at a time which suits you. Alternatively, you can arrange for an ADIS counsellor to call you back at an arranged time and frequency that suits you.

Phone: 9442 5000  Country Callers: 1800 198 024

Parent Drug Information Service (PDIS)

This is a confidential, 24 hour, 7 days a week telephone service which assists families in dealing with the issues of drug use through providing counselling, information and support. Callers can choose to speak to a trained parent volunteer with personal experience or to a professional counsellor (or both).

Phone: 9442 5050  Country Callers: 1800 653 203

Cannabis Information and Helpline

This is a confidential counselling, information and support line for cannabis users and friends and family who are concerned about cannabis use by those close to them. The Helpline is available from 8am – 5pm Monday to Friday (including public holidays)

Phone: 1800 30 40 50

Quitline

This is a confidential, 24 hour, 7 days a week telephone service providing professional counselling, support and encouragement to help you quit.

Phone: 13 78 48
ONLINE SUPPORT AND USEFUL WEBSITES

The quit coach

A free computer program which provides ideas and suggestions to help you quit smoking and stay quit

www.quitcoach.org.au

Family Drug Support

A website for family and friends affected by alcohol and drug use.

www.fds.org.au

Turning Point: Counselling Online

This is a confidential, no cost, 24 hour, 7 days a week service which offers online text-based counselling to alcohol and other drug users, or the substance use of a family member, relative or friend. Counselling Online can be accessed from any computer in Australia with a dial-up or broadband connection to the internet. This can be from a personal computer at your home, workplace or community setting.

www.counsellingonline.org.au

MENTAL HEALTH INFORMATION AND SUPPORT SERVICES

Beyond blue Info Line

The Beyond blue info line provides access to information and referrals to relevant services for depression and anxiety related matters. You can call the info line for the cost of a local call or send an email.

Phone: 1300 22 4636  www.beyondblue.org.au

Salvo Suicide Care Line.........9442 5750

Mental Health Emergency Response Line.........1300 555 788

AOD INFORMATION AND SUPPORT SERVICES

Family Drug Support.........1300 368 186

Aboriginal Alcohol & Drug Service.........9221 1411

24 HOUR COUNSELLING AND SUPPORT SERVICES
The Samaritans (Emergency) .......... 9381 5555
(Youth line) ............. 9388 2500
Salvo Care Line ................. 9442 5777
Crisis Care Helpline .......... 9223 1111
Appendix N

Q82 - Please describe any other harm reduction strategy you have used while using ecstasy over the past year.

<table>
<thead>
<tr>
<th>Strategy</th>
<th>Response</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stay around ppl i trust. Take 1/4 first. Safe pkace3</td>
<td>None</td>
</tr>
<tr>
<td>Personal recommendations and multiple experiences of friend purchasing from same supplier and extensive experience with that drug. Taking the drug in presence of a friend who is a doctor.</td>
<td>Never took it</td>
</tr>
<tr>
<td>Drink water</td>
<td>None</td>
</tr>
<tr>
<td>Drink water and be safe</td>
<td>None</td>
</tr>
<tr>
<td>Guienei pigging mates</td>
<td>None</td>
</tr>
<tr>
<td>I prefer not to use pills as a general stand as I can’t 100% gaurentee what is in them</td>
<td>None</td>
</tr>
<tr>
<td>Use with friends, only use a small amount at first, drink enough water.</td>
<td>None</td>
</tr>
<tr>
<td>Need to</td>
<td></td>
</tr>
<tr>
<td>-----------------------------------------------------------------------</td>
<td></td>
</tr>
<tr>
<td>Asking who has tried the pill and what the effect on them was</td>
<td></td>
</tr>
<tr>
<td>Trust in friends who provide</td>
<td></td>
</tr>
<tr>
<td>Ask ppl if any good</td>
<td></td>
</tr>
<tr>
<td>Word of mouth</td>
<td></td>
</tr>
<tr>
<td>Na</td>
<td></td>
</tr>
<tr>
<td>Orange juice if it is too much</td>
<td></td>
</tr>
<tr>
<td>Magnesium</td>
<td></td>
</tr>
<tr>
<td>I have never used any harm reduction strategies</td>
<td></td>
</tr>
<tr>
<td>Have your mate take it first</td>
<td></td>
</tr>
<tr>
<td>Bought drugs from reputable highly reviewed retailers online. Careful dosage and awareness. Supplements, hydration and healthy eating</td>
<td></td>
</tr>
<tr>
<td>None</td>
<td></td>
</tr>
<tr>
<td>Being well feed and having water available as well as someone knowing my state</td>
<td></td>
</tr>
<tr>
<td>None</td>
<td></td>
</tr>
<tr>
<td>Word of mouth, bought MD off dark web which has lots of reviews</td>
<td></td>
</tr>
<tr>
<td>Ensure good results from other</td>
<td></td>
</tr>
<tr>
<td>None</td>
<td></td>
</tr>
<tr>
<td>Not using ecstasy and using a trusted distributor to provide clean/pure MDMA</td>
<td></td>
</tr>
<tr>
<td>I do not take anything unless I know others who have. I prepare in the weeks prior, ensuring I have been as healthy as I can.</td>
<td></td>
</tr>
<tr>
<td>Make sure to measure quantities</td>
<td></td>
</tr>
<tr>
<td>Taking small amounts at first. Buying off known sources. Trip setters</td>
<td></td>
</tr>
<tr>
<td>I don't use any form of ecstasy/mdma. Had one bad experience a few years ago</td>
<td></td>
</tr>
<tr>
<td>None</td>
<td></td>
</tr>
<tr>
<td>I trust my friends / seller</td>
<td></td>
</tr>
<tr>
<td>None</td>
<td></td>
</tr>
<tr>
<td>Internet</td>
<td></td>
</tr>
<tr>
<td>Drinking lots of water</td>
<td></td>
</tr>
<tr>
<td>Always have a smaller dose if new supply</td>
<td></td>
</tr>
<tr>
<td>Keep each other safe. Spot early signs of bad trip and change environment</td>
<td></td>
</tr>
<tr>
<td>Don’t take ecstasy, mdma is generally cleaner, it’s meant to be pure</td>
<td></td>
</tr>
<tr>
<td>Water, small dose</td>
<td></td>
</tr>
<tr>
<td>Being in a safe environment</td>
<td></td>
</tr>
<tr>
<td>Only take pills from a batch used by someone I know</td>
<td></td>
</tr>
<tr>
<td>5htp, mct oil, potassium supplement</td>
<td></td>
</tr>
<tr>
<td>None</td>
<td></td>
</tr>
<tr>
<td>Only using a well known batch but not tested</td>
<td></td>
</tr>
<tr>
<td>Never</td>
<td></td>
</tr>
<tr>
<td>N/a</td>
<td></td>
</tr>
<tr>
<td>Taking small doses at a time, not all at once</td>
<td></td>
</tr>
<tr>
<td>None</td>
<td></td>
</tr>
<tr>
<td>Only taking pure mdma (not pills)</td>
<td></td>
</tr>
<tr>
<td>Drinking water taking vitamins</td>
<td></td>
</tr>
<tr>
<td>Small limited dosage for 1st use of new pill to gauge strength and side effects before further use</td>
<td></td>
</tr>
<tr>
<td>Moderation</td>
<td></td>
</tr>
<tr>
<td>Ask mates</td>
<td></td>
</tr>
<tr>
<td>Not taking it anymore</td>
<td></td>
</tr>
<tr>
<td>Educating my self about other drug interaction and as much as i can about that drug im taking and learning the pros and cons and risk and reward</td>
<td></td>
</tr>
<tr>
<td>Orally rather than insuffelation</td>
<td></td>
</tr>
<tr>
<td>Asking friends, google, start small doses</td>
<td></td>
</tr>
<tr>
<td>Research</td>
<td></td>
</tr>
<tr>
<td>None</td>
<td></td>
</tr>
<tr>
<td>5htp</td>
<td></td>
</tr>
<tr>
<td>Friends</td>
<td></td>
</tr>
<tr>
<td>Low dose, water, staying cool</td>
<td></td>
</tr>
<tr>
<td>Word of mouth</td>
<td></td>
</tr>
<tr>
<td>A trusted dealer</td>
<td></td>
</tr>
<tr>
<td>Buy off turswothy sorces</td>
<td></td>
</tr>
<tr>
<td>Trusted dealers</td>
<td></td>
</tr>
<tr>
<td>Take a half first batch</td>
<td></td>
</tr>
<tr>
<td>Comedown buddies and healthy eating and water</td>
<td></td>
</tr>
</tbody>
</table>
Always make sure someone else has tried it first

Personally knowing and trusting friend who shared them

Take half or a quarter to check before

Friends knowledge and connections

Neuroprotective nootropics, 5htp supplement

Make sure other ppl have used it first

Harm reduction tents, naloxin

None

None

Buy from one person

dark nets

Deepweb markets