Modification of Youth Substance Use Behaviour by Fear-based versus Harm-reduction Drug Websites

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BSc (Cum Laude)

A report submitted in partial requirement for the degree of Master of Psychology (Clin) at the University of Tasmania.

I declare that this thesis is my own work and that, to the best of my knowledge and belief, it does not contain materials from published sources without proper acknowledgement, nor does it contain material which has been accepted for the award of any other higher degree or graduate diploma in any university.

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The Effects of Fear-based versus Harm-reduction Drug Education Approaches on Youth Substance Use Behaviour

Abstract

There appear to be two main philosophies toward drug education; one underpinned by a moral stance against drug use, which tends to adopt fear-based approaches, and another based in harm-reduction which focuses on maximising health should people decide to use drugs. Unfortunately, many drug education campaigns do not assess appropriate key outcome measures for the impacts to be evaluated in a satisfactory manner. Meta-analyses have found that variables from the Theory of Planned Behaviour (TPB) (Ajzen, 1991) can account for moderate to large variances in behavioural intentions and behaviours over a range of activities. Substance-related TPB studies, which typically include minor extensions or additions in the model, support the model's efficacy in predicting both intentions and behaviour. However, the Prototype Willingness Model (PWM) (Gibbons, Gerrard, Blanton, & Russell, 1998) has been shown to explain additional variance in actual behaviour above the TPB, in substance use behaviours which are not premeditated. By incorporating the PWM components as well as other additional variables such as moral norms, descriptive norms, knowledge, into the TPB, it is possible to synergise the strengths of the models to evaluate the impact of fear-based and harm reduction drug education more comprehensively. Furthermore, whilst the extended TPB model may assist in explaining and predicting key outcomes of substance use behaviours after exposure to drug education materials, persuasion models such as the Elaboration Likelihood Model (ELM) (Petty & Cacioppo, 1986) can help explain as well as optimise the persuasive processes in drug education. As the internet is one of the most popular sources of substance-related information today, using a comprehensive social cognition model such as the extended TPB model to research the key outcomes of the online fear-based and harm reduction drug education approaches, could be useful in empirically establishing, and refining, the efficacies of these approaches.

1 Introduction to global approaches to drug education

Issues surrounding the themes of substance use, illicit or otherwise, have always evoked strong views from both sides of the philosophical spectrum, influencing both substance related policies and programs. At a policy level, there appear to be two main approaches to drug education - on one hand, programs underpinned by a moral stance against drug use typically lead to campaigns designed to induce an abstinent population (sometimes classed as "zero tolerance" toward drug use in society), often using fear as a key campaign mechanism, and on the other hand, programs that take no moral stance on drug use per se but rather focus on maximising public health tend to lead to campaigns based on the philosophy of harm-reduction.

Fear-based campaigns are typically grounded on the intuitive premise that fear is a strong motivator for attitude change to avoid a noxious consequence (Rogers, 1975). A fear-based education campaign would highlight the negative aspects of a particular issue, often emphasising extreme but uncommon events, whilst minimising any positive aspects (see Figure 1 for example). In relation to illicit drugs, fear-based campaigns are usually favoured politically as they appear to have high face validity and do not challenge most social norms and values.

Research in the area of drug education (Munro & Midford, 2001; Reyna & Farley, 2006) show that the actual outcomes of such fear-based approach are generally weak, possibly because young people, the usual target population of such campaigns, are already very aware of the risks of substance use, and the stigma that is generated by such a negative environment drives those who actually need help underground.

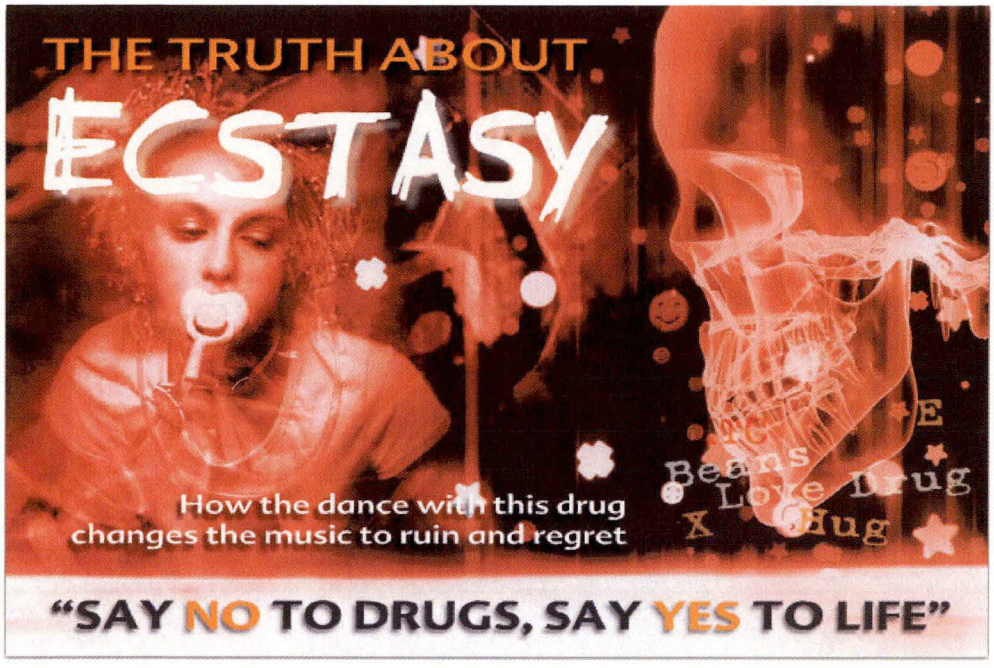

Figure 1. Example of online fear-based campaign material from www.drugfreeworld.org (Foundation for a Drug-Free World, 2007).

Opponents of such zero-tolerance policies suggest an alternative approach to drug education, commonly known as harm-reduction. Harm-reduction is defined as "a policy or programme directed towards decreasing adverse health, social and economic adverse consequences of drug use even though the user continues to use psychoactive drugs at the present time (Single, 1995, p.239)". Although critics often view this as a sign of permissiveness or even encouragement of illegal substance use, proponents view this as a realistic prioritisation of goals, that aims to deal with the immediate issues but does not impose any long-term objective on the person (Single, 1995) (see Figure 2 for example).

Figure 2. Example of online harm-reduction campaign material from www.thegooddrugsguide.com (The Good Drugs Guide, 2007).

In the United States, the National Youth Anti-Drug Media Campaign (NYADMC), whose goal is to "pursue a vigorous advertising and public communications program dealing with the dangers of drug use by youth (Orwin et al., 2006, p.xvi)", is funded by Congress and is one the largest campaigns of its kind, having been fully implemented since 1999. The campaign themes included building resistance skills (learning how to refuse offers of using substances), normative education (education on how widespread the use of substances are amongst peers and what their

peers thought about it), negative consequences (learning about the damaging effects of substance use) and early intervention, but the emphasis on these themes varied throughout the campaign duration. However, the message that drug use is likely to cause various harmful social, psychological, and physical effects has generally been the consistent, primary emphasis throughout the campaign. The Australian equivalent, the National Drug Campaign (NDC) (Pennay et al., 2006), was launched in two separate phases: Phase One, launched in 2001, targeted parents of children aged 8 - 17, whilst Phase Two, launched in 2005, targeted youths directly. The campaign's fear-based information was disseminated through various means including television advertisements, print advertising and online advertising. The screenplay of the NDC television advertisement on ecstasy (methyelenedioxymethamphetamine, MDMA) was:

> *The commercial opens on a scene in a nightclub. A girl is lying on the floor. She has collapsed and is sweating profusely. Her friends are frantic around her. They ask her if she is alright and roll her over. Her distraught boyfriend watches on. The camera moves rapidly through a nearby television showing a film clip into in the bedroom of a 16 year old girl. She is sitting forlornly on her bed, tears rolling down her cheeks. Her boyfriend says he's not sure why she takes ecstasy as she gets so depressed coming down. The camera moves rapidly through the glass of the girl's window and into the window of a building across the road into a dental surgery. A young man is in the chair with a dentist operating on his mouth. We hear the young man's thoughts, as well as the dentist's voice during the examination. Over a rapid montage of damaged teeth close-ups and the guy's agonised face, we hear the dentist remark on how the front teeth have cracked*

through grinding. We also hear the young man's worried thoughts. The camera moves rapidly through a picture on the wall. The curtains in the picture suddenly become curtains around a bed in an intensive care unit in a hospital. They pull to one side as we see a young man experiencing toxic meltdown. Hospital staff are frantically trying to reduce his body temperature as his distraught parents look on. We hear the worried voice of his girlfriend. A super[visor] appears and we hear: "Ecstasy. You don't know what it'll do to you." (Pennay et al., 2006, p. 207)

The aforementioned advertisement is a classic example of a fear-based information; amplifying the worst possible scenario of MDMA use whilst insinuating numerous health risks and possible death using excessive dramatic scenes. Whilst the effects portrayed in the advertisement were reflective of the adverse effects of MDMA use, commonly known as 'serotonin syndrome'; the rate of morbidly and mortality of MDMA use, when not used in conjunction with other psychoactive substances, is low in comparison to its prevalence of use (Degenhardt, Copeland, & Dillon, 2005; Koesters, Rogers, & Rajasingham, 2002; Silins, Copeland, & Dillon, 2007).

The official findings of the US NYADMC by Orwin et al. (2006) showed that there were very high exposure and recall by parents and youth groups of the campaign material, and both groups evaluated these ads positively. Whilst the campaign showed intended effects for the parents, such as increases in talking about drugs with children and increased monitoring of their children's behaviour, there were no significant positive effects for the youth group.

Instead, the authors found that there were significant delayed effects of weaker anti-drug norms after exposure to the campaign material, i.e. increasing beliefs that more people use cannabis than was in actuality, as well as indications that exposure to the campaign led to significantly higher rates of cannabis initiation. They hypothesised that the campaign's high exposure inadvertently sent a meta-message that drug use among young people was more prevalent than it actually was, which subsequently translated into increased initiation among previously non-using youth due to the perceived norm of high use among peers. Furthermore, Orwin and colleages also found no evidence that higher exposure to the campaign led to reduced use or abstinence amongst youths who had already started using cannabis.

Similar to the American NYADMC results, there was very high recall of the Australian NDC advertisements and its messages by parents and youth alike (Pennay et al., 2006). However, the formal evaluation of the NDC (Pennay et al., 2006) showed that whilst 42% of the 1490 youths (aged between 13 and 20 years) interviewed about the campaign reported the NDC had influenced them to avoid using drugs or situations where they may be used, the remaining 58% reported various ambiguous responses such as "thinking about consequences of using drugs", "communicating with friends about drugs" or no influence at all. The same post-campaign study showed that young people were also more likely to agree that cannabis, MDMA and methamphetamine were all associated with 'being lazy and lethargic', aggression and depression - which is factually inaccurate - possibly indicating the presence of demand characteristics contaminating the overall results.

Whilst the favourable results in terms of advertisement recall and recognition attained were similar to the American campaign, data on other significant variables such

as social norms and actual initiation, which showed reverse effects in the US, were not examined in the Australian NDC evaluation (Pennay et al., 2006). Hawthorne (2001) argues that measures of any drug education's success depends on its goals and suggested that if educational gains were the aim, then increases in knowledge, self esteem, refusal skills or attitudes towards drug use would be adequate indicators of success. As such, although the NDC was trumpeted as a success in its evaluation, as the NDC evaluation primarily examined campaign awareness, recall of NDC ads, attitudes towards drugs and ease/difficulty in discussing about drugs with parents, there was an inadequate range of significant indicators of actual effectiveness in reducing or eliminating the target population's drug use behaviours. Nonetheless, the findings about the 'likelihood of accepting an offer of drugs', which was in fact a key behavioural indicator, was ironically given less prominence over message recall. Indeed, Hawthorne (2001) asserts that if a program's goal was to decrease or eliminate drug experimentation, use and misuse, public health criteria such as reduction in drug-related health problems and fatalities would be the ultimate indicator of success, which was implied, but not examined in the NDC evaluation.

In line with that argument, a large project which focused on identifying as well as reducing alcohol-related harm, through providing alcohol utility information (education surrounding the contexts of alcohol use), various skills practices (e.g. social resistance skills) and group discussions about identifying and reducing alcohol-related harm in student suggested scenarios, was carried out in 14 secondary schools in Western Australia, known as the School Health and Alcohol Harm Reduction Project (SHAHRP). This showed a reported significant decrease in alcohol-related harm (McBride, Farringdon, Midford, Meuleners, & Phillips, 2004). When compared with a control

group that ran regular alcohol education programs, the results showed that the SHAHRP program caused larger, and earlier, decreases in alcohol consumption. The SHAHRP is considered a harm-reduction based program due to its nature of informing participants of both the utilities of alcohol in certain circumstances, its potential dangers, as well as ways of using it in a safe and moderate manner. This is in contrast to abstinence-based programs which expect recipients to completely refrain from any substance use, typically by exaggerating the dangers of any use.

In addition to the aforementioned findings, the researchers (McBride et al., 2004) found that there was also a delay in alcohol initiation as well as signs of students reverting from being unsupervised drinkers to supervised drinkers and supervised drinkers to non-drinkers, i.e. participants shifted from drinking without any adult supervision to drinking under supervision, as well as from drinking supervised to not drinking at all. The findings established that the harm reduction project's results were comparable, if not better, than abstinence based programs. It may indeed be a better alternative to abstinence based programs because it appears to have impacted upon the entire sample rather than only those without prior experience with alcohol.

The United Kingdom's drug strategy has incorporated approaches from both philosophies toward drug education: showing overall signs of being abstinence-based, yet understanding and exploiting the benefits of using harm reduction interventions (Home Office, 2002, 2007). One of the most popular drug campaigns in the UK to date is the "FRANK" campaign (www.talktofrank.com) which is depicted as a non-judgmental and often humorous source of information, but when further information is solicited, it then explicitly and solely highlights the negative effects of drugs, revealing its philosophical basis in abstinence. A review of the campaign from 2004 to 2006

showed that this strategy caused popularity gains amongst parents, but lost credibility amongst young people (Home Office, 2006). This phenomenon may be explained by the findings of Boys, Marsden, Griffiths, Fountain, Stillwell and Strang (1999) who established that among young people in the UK who were most likely to use psychoactive substances, future consumption is not significantly affected by negative experiences. This could imply that when drug education sources focuses simply on the negative effects of substances, it may not affect the opinions or behaviours of young people and may inadvertently cause them to disregard the entire source. Based on the study's findings, the authors strongly recommended that the complexity behind substance use behaviours be appreciated and to promote alternative ways of satisfying such needs instead of merely highlighting negative effects of such drugs.

White, Degenhardt, Breen, Bruno, Newman and Proudfoot (2006) studied the risk and benefit perceptions of regular MDMA users in Australia and found that they are mostly knowledgeable about drug-specific risks and the array of physical and psychological harms. In light of that, White and colleagues suggest that in order for health promotion messages to be considered credible and acceptable to users, benefits of drug use should be acknowledged. This view was supported by Chambers, Connor and McElhinney's (2005) survey that found many young people requested accurate and unbiased information from professionals, and that the pleasures associated with substance use be acknowledged (Chambers et al., 2005). Shock tactics, a key element of fear-based campaigns were implied to have negative effects, or at best, nothing positive. This suggests that harm-reduction based health promotion information, as it acknowledges positive as well as negative consequences of use, is more likely to be credible and more effective for young people as well as current substance users, in

contrast to the sole emphasis on negative aspects produced by fear-based, zero-tolerance promotion campaigns.

Since the Australian government formed the "Tough on Drugs in Schools" policy in 1997, federal level responsibility for school drug education was moved from the health department to the education department (Midford, 2007). With that change in management, Midford (2007) notes that outcome evaluations for these programs shifted from research evidence and behavioural changes to a focus on practitioner experience and knowledge gain. He then postulated that the shift away from objective, behavioural criteria would result in unrealistic goals as a consequence of susceptibility to political considerations and perceived moral obligations, with funding being channelled into politically favourable programs but not backed by evidence. This is an untenable scenario for health promotion because the criteria to which the success of a drug education campaign would be marked against would be inappropriate at best, and grossly misleading at worst.

2 Health-related theoretical models

Indeed, many health promotion campaigns have fallen into the trap of gauging insufficient and/or superficial measures that do not necessarily translate into real outcomes. Attitudes for instance, a key target of drug education campaigns, have been studied by social psychologists for a long time as a key determinant of behaviour, but the link between the two is not exactly straightforward nor simple (Cooke & Sheeran, 2004; Glasman & Albarracin, 2006). Attitude change alone is seldom sufficient to explain or predict actual behavioural changes. There are many variables that mediate the link between attitudes and behaviours, and among the more prominent theories that

attempt to explain the pathways that surround behaviour are the Protection Motivation Theory (PMT), the Health Behaviour Model (HBM), the Theory of Reasoned action (TRA), the Theory of Planned Behaviour (TPB) and the Prototype/Willingness Model (PWM) (Azjen, 1991; Gibbons, Gerrard, Blanton et al., 1998; Harrison, Mullen, & Green, 1992; Milne, Sheeran, & Orbell, 2000). Thus, in order to evaluate the effectiveness of drug education campaigns comprehensively, it is important to have an empirically-supported conceptual framework that can explain the various links to behaviour in order to understand the effectiveness of programs aiming to influence these factors.

2.1 Protection Motivation Theory (PMT)

The original Protection Motivation Theory (PMT), as proposed by Rogers (1975), was a simple model that attempted to tie together prominent concepts of the time in regard to *fear appeals*, which are persuasive messages that attempt to evoke fear from an audience, and *attitude change*, with no addition of novel hypotheses and assumptions. Rogers suggested that fear appeals can be used to persuade people to avoid a noxious situation by embracing recommended attitudes and subsequent actions.

The original model proposed that the three key components of fear appeals are the magnitude of noxiousness (i.e. *severity*), the probability of a noxious event (i.e. *vulnerability*), and the efficacy of a protective response (i.e. *response efficacy*). Self-efficacy was included as the fourth core factor in a subsequent revised model (Rogers, 1983).

Rogers (1975; 1983) asserted that attitude changes due to *protection motivation,* which is primarily evoked by the cognitive appraisal processes in the face of a

threatening event, rather than the emotional state of fear. Nonetheless, the PMT assumes that the decision maker will be predisposed to heuristic judgments, i.e. 'mental shortcuts', and the intensity of emotions elicited from the fear appeal rather than logical deliberations necessarily.

The model (see Figure 3) suggests that exposure to fear appeals would initiate two simultaneous processes in an individual - a *threat appraisal* process and a *coping appraisal* process. The threat appraisal process is expected to assess the consequences of acting maladaptively, whereby provoking an individual to consider the benefits of maintaining the current behaviour against the perceived vulnerability to, and severity of, a threat. On the other hand, the coping appraisal process is used to assess the consequences of coping adaptively, whereby the individual considers about how likely a change in behaviour can help deal with the threat, how much control the person has over the behaviour, as well as what the costs are in changing the behaviour. The sum of these views would then determine how motivated the person is to take the suggested protective action.

According to the PMT, in a hypothetical situation where an individual is presented with a anti-drug fear appeal, the Australian NDC for example, the person would firstly weigh in their minds the benefits of using the drugs by how dangerous the effects are of the drugs are, and how likely they would be affected by these negative effects. In parallel to that, the individual would also think about how much control they have over the use of the substance and how effective a protective response, namely not using the drugs (or minimising harmful patterns of use) would be. The costs of performing these actions, such as not fitting in with peers, feeling bored and so on,

would then also considered. Finally, based on these processes, the person would then choose whether to use substances or not.

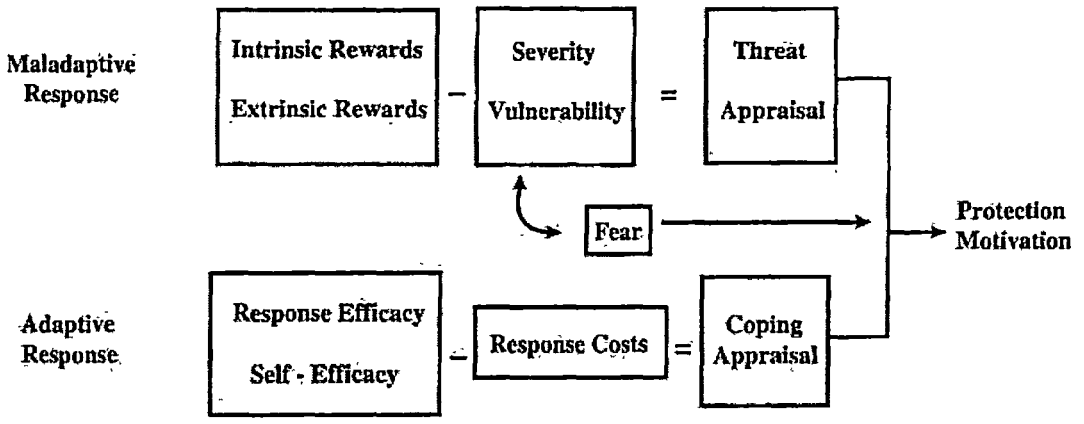

Figure 3. A visual representation of the Protection Motivation Theory (PMT) model.

2.2 Health Behaviour Model (HBM)

The Health Behaviour Model (HBM) is another prominent health-related theoretical model, which, in its earliest form, appeared similar to the PMT. However, Rosenstock (1974) described the original model as distinctively avoidance-oriented, in that people took health action to avoid diseases rather than because they were drawn by positive health reasons. Another key difference between the PMT and HBM is that fear is not an important ingredient - a person may be affected simply by noticing personal symptoms or receiving additional information via the media. The HBM (see Figure 4) prescribes that an individual needs to perceive susceptibility to an at least moderately severe disease/condition and also to perceive that taking a specific action would diminish the disease's severity or likelihood of occurrence. However, this is mediated by perceived barriers including cost, convenience, pain, and embarrassment. Modifying

factors such as personal knowledge and demographic differences are also taken into account.

In an example, the HBM postulates that an individual might modify substance use behaviours when cues to a significant and likely threat to the person's wellbeing becomes evident, such as personally experiencing organ damage or even reading about such a possibility in the newspaper. If the threat appears serious enough and that the person may be susceptible to it, the person might then be prompted towards reducing or terminating substance use after considering barriers to change, such as the effort required to make lifestyle changes or having to endure withdrawal symptoms.

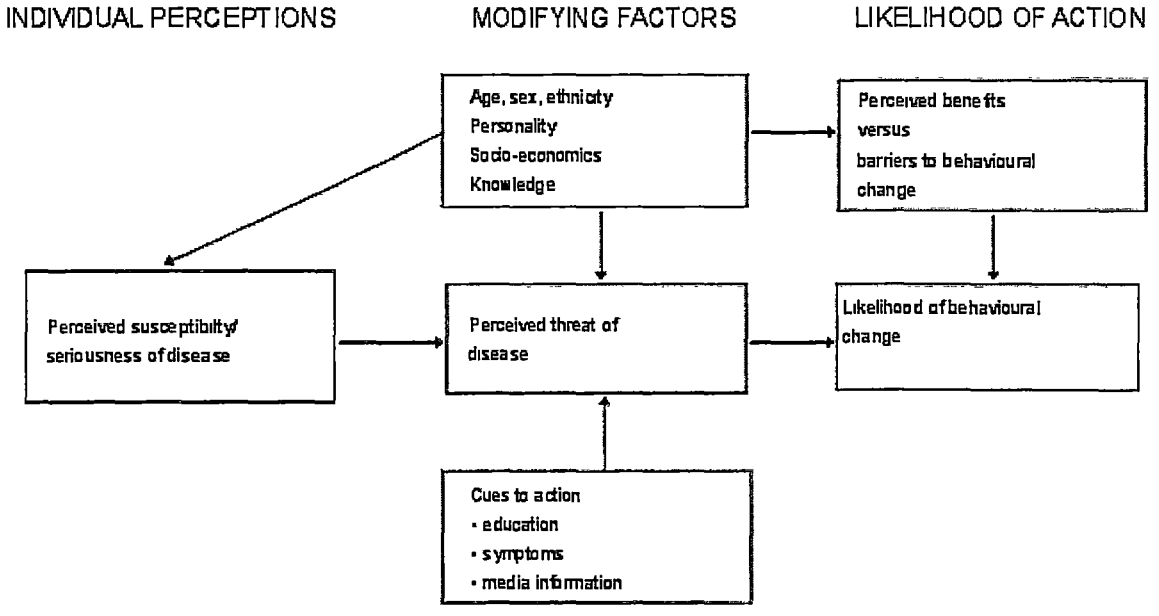

Figure 4. A visual representation of the Health Belief Model (HBM).

2.3 Theory of Reasoned Action (TRA)

Fishbein and Ajzen (1975) were fastidious about defining the Theory of Reasoned Action (TRA) components and its scope. As the name would suggest, it confines itself to volitional behaviours (Eagly & Chaiken, 1993). The TRA is based on

the assumption that humans are rational beings who are strongly influenced by the information provided to them. The model (see Figure 5) posits that a voluntary *behavioural intention* is the best predictor of overt *behaviour*, and that an individual's *attitudes* and *subjective norms* would form this intention. In the contexts of decisions to take illicit drugs for example, the likelihood of an individual intending to use a substance would be much greater if the person had a positive view of the said drug (positive attitude) as well as perceiving the use as socially acceptable by significant others (positive subjective norms), and vice-versa. However, for a valid prediction to occur, Fishbein and Ajzen asserted that all three variables have to be assessed at an identical degree of specificity. For instance, it would only be useful to elicit an individual's attitude, subjective norms and behavioural intention within limited contextual parameters such as one particular time and setting.

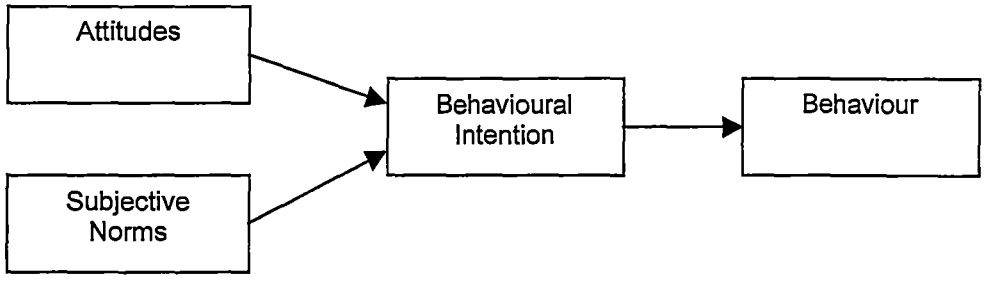

Figure 5. A visual representation of the Theory of Reasoned Action (TRA).

Furthermore, the behavioural intention could only be accurate barring any interfering variables from the time it was elicited and the behaviour was expected to occur. So while this level of precision in its operational definitions would seemingly increase the model's internal validity, it significantly limits its generalisability.

2.4 Theory of Planned Behaviour (TPB)

Ajzen (1991) subsequently developed the Theory of Planned Behaviour (TPB) as an extension of the TRA to overcome the original model's limitations in explaining and predicting non-volitional behaviours, and this is arguably the most widely known and used attitude-behaviour model at this time (Ogden, 2003). The key addition in the TPB (see Figure 6) is *perceived behavioural control* (PBC), which is an individual's sense of control or command over performing an action. Ajzen proposed PBC as both a third independent determinant of intention, and as a mediating factor between intention and actual behaviour. However, the relative influence of each of the three variables - attitude, subjective norm, and PBC - in determining intention is expected to differ across behaviours and situations. Additionally, the TPB postulates that as voluntary control over behaviour diminishes the PBC increases in influence. Thus, an individual who might be contemplating whether to use substances would be affected by three primary factors, i.e. how positively or negatively the substance is regarded by the person (attitude), whether the use is approved by the key figures in the person's life (subjective norms) as well as much how much perceived control the individual has over whether to use the drugs or not (perceived behavioural control). These factors would together impact upon the individual's planned intention to use the drugs, which in turn is a good predictor of how likely the substances would actually be partaken. Whilst these variables are the core components of the TPB, Ajzen (1991) notes that the model is open to additional components if they account for significant proportions of intention and/or behaviour.

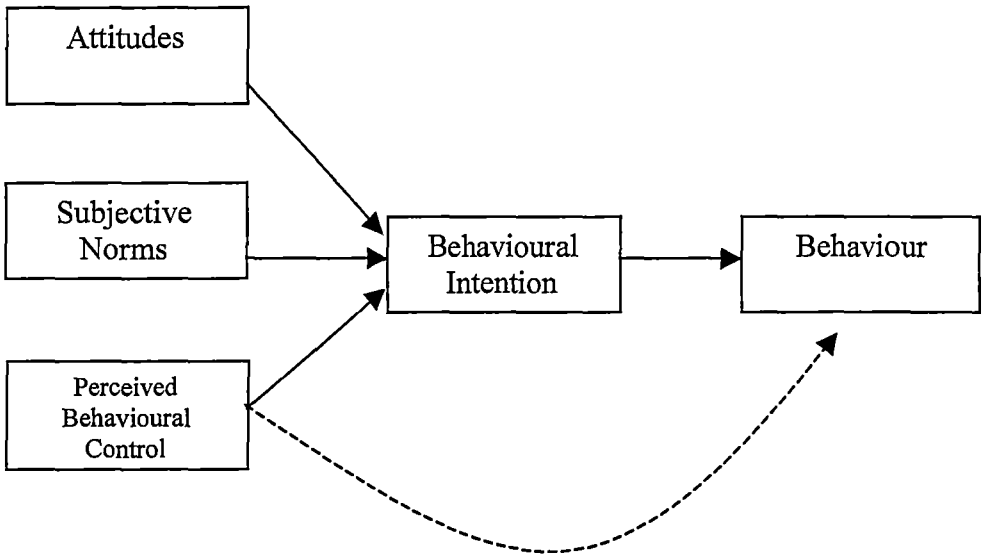

Figure 6. A visual representation of the Theory of Planned Behaviour (TPB).

3 TPB as the apposite foundation for the development and assessment of drug education programs

Empirical PMT studies show conflicting results in regard to the model's utility in predicting behavioural intention (Ho, 2000; Milne et al., 2000; Umeh, 2004). A study by Ho (2000), applying the PMT model to predict behavioural intention to use condoms in 248 participants found that the model explained 56% of the variance in behavioural intention. However, a replication of the study by Umeh (2004) found that only 7.7% of the behavioural intention was accounted for by the PMT variables and hence asserted that the model was deficient in explaining the health decision making process. A meta-analysis by Milne, Sheeran and Orbell (2000) presented modest support for threat- and coping-appraisal components of the model in predicting health-related intentions. Self-efficacy was found to be the most frequently significantly correlated variable with behavioural intention across the studies, compared to the three key original variables in the model (the magnitude of harmfulness of a depicted event, the likelihood of the event,

and the effectiveness of a protective reaction). Whilst intentions had medium-to-strong associations with subsequent behaviour, Milne and colleagues suggested that difficulties with operationalising variables in the PMA model had possibly led to a limited number of studies that had examined the ability of the PMT model framework to understand and predict behavioural decisions.

In regard to the HBM framework, an extensive review by Janz and Becker (1984) noted that the umbrella variable of "*perceived barriers*", which included "*social approval*" and "*self-efficacy*", was the most potent component of the HBM in terms of significance ratios, which was defined by the researchers as the number of positive and significant results ($N = 25$) divided by the total number of studies ($N = 28$), at 89%. Janz and Becker went on to conclude that the study provided strong empirical grounds for corroborating the model in explaining and predicting individuals' health-related behaviours. However, Harrison, Mullen and Green (1992) were critical of Janz and Becker's (1984) inclusion criteria and use of significance ratios. Harrison et al conducted a more statistically rigorous meta-analysis of this data, using strict inclusion criteria for studies into the analysis (based on the reliability and validity of measures used in the studies, including only 16 of the 147 original studies), finding weak effect sizes and a lack of homogeneity in key HBM dimensions. Importantly, if variables included in the HBM framework were not homogenous, it would be fallacious to make any conclusions as to the efficacy of the model because the constructs measured may be very different from to study to study. Whilst not rejecting the model outright, Harrison and colleagues were very critical about the lack of congruity in the dimensions of the HBM, noting that disparity between studies' definitions of key variables results in difficulty interpreting and comparing findings.

Unlike the PMT and HBM, the TRA and TPB encompass the study of both health and non-health related behaviours such as exercising, condom use, leisure activities, drink driving and job seeking (Hardeman et al., 2002). As a conceptual extension of the TRA, the TPB has been found in various studies to be superior to the TRA, and has been accepted in the research community as a natural replacement for it (Ajzen, 1991, 2002c; Armitage & Conner, 2001). In an extensive meta-analysis of up to 185 independent studies, Armitage and Conner (2001) found that over a range of activities such as those noted above, TPB variables can account for 39% of the variance in intention, 38% for self-reported behaviour and 27% for observed behaviour.

In the realm of substance use behaviours specifically, there have been little, if any, studies involving HBM or PMT. TPB studies in the area, which typically included minor extensions or additions in the model, support the model's efficacy in predicting both intentions and behaviour (Armitage & Conner, 2001; Conner et al., 1998; McMillan & Conner, 2003; Orbell, Blair, Sherlock, & Conner, 2001). In a study on illicit substance use amongst students, McMillan and Conner (2003) found that all three TPB variables independently correlated with drug use intentions. Together, attitudes, subjective norms and PBC accounted for 48% of intentions in MDMA use. A medium-to-large proportion of the variance in self-reported MDMA use, 40%, was explained by intention and PBC. Between legal and illegal substances, Armitage (1999) found different prediction power using a slightly modified version of the TPB. With cannabis, 88% of the variance in intention was explained, whilst for alcohol, it was only 66%. As for actual behaviour, the TPB accounted for 60% of the variance for cannabis and only 17% for alcohol. In Conner, Sherlock and Orbell's (1998) study on MDMA use, TPB variables accounted for between 50% and 63% of the variance in intentions. Intentions

to use MDMA were found to explain 18% of the variance in MDMA use, although the overall equation, incorporating intentions and PBC, which the researchers divided into self-efficacy and perceived control over behaviour, accounted for up to 55%. With the wealth of research in this area, in addition to its promising predictive power, the TPB appears to be a better tool in understanding and predicting substance use than models such as the PMT and HBM. As such, the subsequent sections of this review will examine the role of each of the TPB components in turn and review their applicability in the effects of harm-reduction and fear-based drug education campaigns.

3.1 Direct and indirect measures

All psychological TPB variables can be assessed via direct and indirect measures, which comprises of global measurements as well as aggregations of relevant sub-components (examples and elaborations of direct and indirect measures will be explored in more depth in Section 3.1.2 below), and whilst both approach the variable under examination differently, they tap the same constructs and are expected to be correlated (Francis et al., 2004). Some studies (e.g. Armitage, 1999; Conner et al., 1998) have shown that the efficacy of using direct and indirect assessment of attitudes and beliefs varies depending on the behaviour under study, sample population, behavioural context, and indeed the researcher's operational definitions of key study variables. Certainly, these findings give credence to Ajzen (2002b) and Francis et al.'s (2004) call to include both *direct* and *indirect* measures of all components of the TPB model to attain a comprehensive explanation of the constructs because although correlated, the measures are based on different premises of the fundamental cognitive framework (discussed below).

3.1.1 Attitudes

The term 'attitude' is arguably one of the most ambiguous terms in the study of psychology, where there have reportedly been almost 500 distinct operational definitions for that single term (Fishbein & Ajzen, 1972; Lemon, 1973). Whilst there are still differences in the manner in which attitude is measured, there has been widespread consensus in the scientific community that attitudes are summary evaluations of an entity, which comprises of cognitive and affective components (Ajzen & Fishbein, 1977; Eagly & Chaiken, 1993; Petty, Wegener, & Fabrigar, 1997). However, there are still disagreements as to the weight of these cognitive and affective evaluative components. Eagly and Chaiken (1993) propose that neither have any special priority and that their respective importance changes depending on the target object. For the TPB however, Ajzen (2001) employs the expectancy-value model (Fishbein & Ajzen, 1975, discussed below) which assumes that evaluations are primarily the products of cognition. So whilst the TPB model acknowledges the influence of affective contributions to attitude, it is deemed as only having an incidental effect (Ajzen & Fishbein, 2005).

In regard to attitudes that are well-formed and explicit, Ajzen (2002a) prescribes direct measures as being fairly accurate gauges of this variable. The direct measure of attitudes can be elicited by using a set of bipolar evaluative adjective scales, which an individual rates in relation to the object under study such as good– bad, harmful–beneficial, desirable–undesirable, pleasant–unpleasant, and useful–useless using a Likert-type approach. Azjen has found that the evaluative semantic differential to be internally consistent and stable across time when adequate numbers of such scales are used. Studies on substance use that employed direct measures of attitude have found

them to account between 18% and 41% of intentions (Conner et al., 1998; Orbell et al., 2001). The discrepancy may be due to differences of sample characteristics and/or data analyses in the studies, in addition to differences due to the target behaviour under study, as noted by Armitage (1999, Section 3.0).

An alternate means of measuring attitude toward an object is based on the expectancy value model of attitudes (Fishbein & Ajzen, 1975). This indirect measure of attitudes postulates that people have certain salient beliefs about an object/action and that they naturally form positive or negative evaluations of these attributes of the object or action. Thus, the model states that the sum of *salient belief strength* (how much the individual considers a belief as true) multiplied by the *outcome evaluation* (how positive or negative the outcome is), known as *behavioural belief*, is directly proportionate to attitude, and therefore can be considered an indirect assessment of attitude. For example, the rating of an individual's belief that using MDMA is very likely to cause euphoria, can be multiplied by the person's high rating of how positive it is to experiencing euphoria, cumulating to a highly positive behavioural belief. This 'belief-based attitude' can be used as an adjunct to the direct measure of attitude, as well as an alternative form of measurement for target objects that are not salient or socially acceptable, such as illicit drug use. Fishbein and Ajzen (1975) caution that such an indirect assessment of attitude toward an object or behaviour requires assessment of multiple behavioural beliefs, and an examination of the aggregate of these beliefs rather than a single item. This is because a single item would be insufficient in representing the complete range of behavioural beliefs that one has about an object or behaviour.

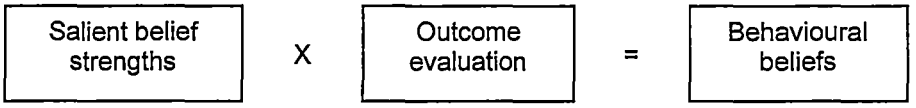

Figure 7. A visual representation of the expectancy value model of attitude.

TPB studies on substance use behaviours have found large correlations between the indirect and direct measure of attitude (Armitage, 1999; Conner et al., 1998). More importantly, the data collected from behavioural beliefs extends understanding of the underlying bases for people's attitudes. For instance, Orbell and colleagues (2001) found that MDMA users were more likely affirm positive effects of the drug than non-users. However, they found that negative outcome expectancies were endorsed by both groups. In another study on MDMA use, the researchers found significantly different belief patterns between students and regular club-goers (Conner et al., 1998). These exemplify that whilst the attitude variable may be sufficient in accounting for intention, tapping the behavioural beliefs constructs can assist in providing a more meaningful interpretation of the data.

3.1.1.1 Attitude ambivalence

Conventionally, attitude has mostly been conceptualised along a continuum from completely negative, to complete indifference, to completely positive. Such a formulation would appear to be a straightforward and intuitive construct. However, there has been a rise in studies of attitude ambivalence, which is defined as having inconsistent beliefs, conflicting emotions or even contradictions between beliefs and emotions (Ajzen, 2001; Eagly & Chaiken, 1993). For instance, an individual may enjoy

the pleasurable moods of using cannabis, yet experience strong feelings of guilt at the same time. Whilst it is possible for specific components of an attitude to be strong, a high degree of ambivalence would render the salient attitude at any time relatively malleable and unstable (Eagly & Chaiken, 1993; Thompson, Zanna, & Griffin, 1995). Thus, attempts to predict behaviour from an ambivalent attitude would logically be limited.

The literature shows that the ambivalence construct is a significant negative moderator between attitude and intention, between attitude and behaviour, and also between intention and behaviour (Conner et al., 1998; Cooke & Sheeran, 2004; Crano & Prislin, 2006). Nonetheless, it has been suggested that when the context of the behaviour and attitude are specified precisely, the particular aspect of even an ambivalent attitude would become more accessible and salient, increasing the predictive power for at least that particular context (Ajzen & Fishbein, 1977; Eagly & Chaiken, 1993; Thompson et al., 1995). For instance, whilst a person may be ambivalent about the idea of outlawing abortions, if given a very specific context such as what the person might believe about the right of a person to have an abortion when the pregnancy is a result of rape, then the predictive value of the response would be more representative at least in the said context. In sum, it would appear that attitude ambivalence can be an instructive addition to the any predictive model (Petty et al., 1997).

3.1.2 Knowledge

Whilst behavioural belief is the primary indirect measure for attitude, another potentially useful variable to consider is knowledge. Although these appear to be very similar concepts within the TPB framework, Ajzen (1991) stated that in relation to

attitudes toward a particular behaviour, beliefs are linked to the outcomes or other relevant attributes of the behaviour. However, it is implied that an individual's beliefs may be merely based on a person's assumptions; whereas knowledge is commonly defined as information that is true and based on justifiable evidence. Thus aside from being a common measure in the outcome studies of drug campaigns, knowledge about a drug's effect may influence behavioural beliefs, and subsequently attitudes, in regard to the drug within the framework of the TPB.

3.1.3 Subjective Norms

Subjective norms, which Ajzen (1991) describes as the social factor of perceived pressure to behave in a certain manner, can be tapped directly by asking the respondent as to whether 'important others' approve of a said action (for example, "Most people who are important to me think that my smoking cannabis would be *undesirable-desirable*"). An indirect measure of subjective norms is attained by multiplying *normative beliefs* (for example, "My friends think I should not use cannabis; *Agree-Disagree*") and the *motivation to comply* (for example, 'In relation to cannabis use, I do what my friends think; *Agree-Disagree*"), which Ajzen postulates will be directly proportionate to subjective norms. These normative beliefs have a more narrow term of reference, such as the approval of specific social groups like family or friends, which is then multiplied by the individual's motivation to comply with the perceived social pressure from the said referent groups (Ajzen, 2002b).

Eagly and Chaiken (1993) however, suggested that there is substantial overlap between the construct of attitude and that of subjective norm, highlighting the high degree of confounding and multicollinearity between the two constructs in the model

when simultaneously run in a regression equation. They offered that the behavioural belief and normative belief constructs can be argued to overlap or even be interchangeable by merely changing the phrasing of the statements, such as "I have a good time with my friends when I am using ecstasy" as compared to "my friends are supportive of me using ecstasy". It is quite evident that most TPB studies will establish significant, positive correlations between subjective norms and attitudes, generally in a range between .44 to .66 (e.g. Albarracin, Johnson, Fishbein, & Muellerleile, 2001; Orbell et al., 2001; Rivis & Sheeran, 2003; Sheeran, Conner, & Norman, 2001). On the other hand, these strong correlations do not necessarily prove multicollinearity. A likely concession may be, as Park (2000) projected from his study, that if attitude was split into two discrete components, i.e. social and personal, subjective norms would only be significantly related to social attitudes but not personal ones. Hence, this issue may be resolved by operationally defining the two terms very clearly and discretely, with an example of a personal attitude being "using cannabis makes me feel depressed"; and an example of a social attitude being "using cannabis makes me argue with my partner".

In addition to normative beliefs, several other researchers have suggested the value of incorporating *descriptive norms* as an additional social predictor of intention, including those involving substance use behaviours (Conner et al., 1998; McMillan & Conner, 2003; McMillan, Higgins, & Conner, 2005; Rivis & Sheeran, 2003). A descriptive norm solicits the perceived engagement of referent groups in certain behaviours, tapping an indirect relation between an action and a referent group's approval of it. Thus instead of a more injunctive manner used in identifying subjective norms, such as "my friends think I should not smoke", descriptive norms capture the indirect nature of social approval via examining the extent of agreement with the

statement "most of my friends smoke". In an extensive meta-analysis of the role of descriptive norms Rivis and Sheeran (2003) found that the relationships between descriptive norms and intention were stronger among younger samples such as school children and undergraduate students and for health-risk behaviours as opposed to older, non-student samples and health-promoting behaviours. The descriptive norms were shown to explain 21% of variance in the prediction of intention in younger samples and 23% in health-risk behaviours.

3.1.4 Perceived Behavioural Control (PBC)

The addition of *perceived behavioural control* (PBC) is the primary difference between the TPB and TRA. Ajzen (1991) describes PBC as being very similar to the construct of self-efficacy, which is an individual's belief of the ease or difficulty in executing a particular behaviour. However, PBC is seen as encompassing both the concepts of self-efficacy and controllability, which are beliefs about the degree to which carrying out an action is under the influence of the individual (Azjen, 2002). Ajzen (1991) notes that in lieu of actual control, one's perception of control is the closest approximate to it. In a meta-analysis of various health behaviour models including the TPB, Webb and Sheeran (2006) found that effects of intention on behaviours were positively mediated by both actual control, and PBC.

Whilst Armitage and Conner's (2001) meta-analysis of 185 studies on the TPB showed that the PBC independently predicted intentions and behaviour in a broad range of spheres, they questioned the nature and antecedents of the construct. They noted that in many TPB studies, PBC has not been operationalised in a consistent manner, leading to difficulties in comparing results across studies. This suggested lack of congruence

may explain the disparity in the results of the following studies on substance use: In Conner and McMillan's (1999, pp.197) study on cannabis use PBC was defined as "based upon an evaluation of the power of factors likely to facilitate or inhibit the performance of the behaviour, each weighted by their frequency of occurrence". PBC which was measured by four direct measure items (e.g. "how much control do you think you have over whether or not you use cannabis/marijuana in the next 3 months") was found to be significantly correlated with intention only for respondents whose attitudes towards the drugs were negative or neutral. In contrast, Umeh and Patel (2004, pp.26) operationalised PBC as a construct that "encapsulates beliefs about whether one possesses the necessary skills, resources and opportunities to execute the behaviour, and the power of these factors to actually facilitate/inhibit the behaviour", and used two measures of PBC, those involving the consumption of the substance (Eleven items, e.g. "Within the next two months, how much control do you feel you have over taking ecstasy?") and obtaining the substance (Three items, e.g. "How confident are you that you could get some ecstasy within the next two months?"). Umeh and Patel found that for MDMA use behaviours, PBC was only significantly related to intention for participants who viewed the substance positively.

In a study that ranged across different substances, McMillan and Conner (2003) retained their original conceptualisation (Conner & McMillan, 1999) of PBC but used indirect belief-based measures (the multiplication and averaged of control beliefs, e.g. "I am in a bad mood - frequently/infrequently", and power item , e.g. "Being in a bad mood makes my taking this drug - more likely/less likely") of PBC instead of direct measures and found that PBC was significantly correlated with intention at all levels of attitudes for amphetamine and cannabis, but unrelated to intention when attitudes were

negative for LSD and MDMA. These examples illustrate the lack of uniformity in the operationalisations of the PBC construct across TPB studies, which may make it difficult to generalise findings.

Another plausible reason for the discrepancies is that the type of behaviour - or in this case, substance type - in question affects the concept of volitional behaviour strongly. For instance, in a study on the use of various substances, Orbell and colleagues (2001) divided the PBC construct into PBC over obtaining the substance, as well as PBC over consuming the drug. This novel way of using the PBC added 7% each variance to the prediction of intentions. It would appear that for substance use behaviours, Orbell and colleagues' (2001) operationalisation of PBC taps a larger set of controllability and self-efficacy issues within the model.

3.1.5 Behavioural intentions

In both TRA and TPB, behavioural intention is seen as the key antecedent variable of volitional behaviour. The construct is expected to capture the major driving factors that regulate a behaviour (Azjen, 1991). Barring intervening events that may alter the intention during the time of measurement and the time of behavioural observation, intentions are proposed to be the most practical manner to attain accurate predictors of behaviour (Fishbein & Ajzen, 1975). TPB studies on substance use behaviours have shown intentions, after mediation by PBC, to significantly correlate with behaviours, having medium-to-large effects, explaining between 51% to 72% of variance in actual behaviour (Conner & McMillan, 1999; Johnston & White, 2003).

As indicated earlier, intention sits within the TPB framework, which is based on the assumption that human beings are basically rational creatures that act based on

various attitudinal and social beliefs (Azjen, 1991; Eagly & Chaiken, 1993; Fishbein & Ajzen, 1975). Behaviours that may be externally perceived as illogical or foolish, may in fact be rational albeit based on very short-term, or hidden, payoffs (Reyna & Farley, 2006). Based on that premise, one can understand why a stated behavioural intention is expected to be carried out successfully as PBC increases (Azjen, 1991). Whilst current research literature has consistently supported the efficacy of the TPB as a predictor of intentions and behaviour (Armitage & Conner, 2001; Conner et al., 1998; McMillan & Conner, 2003), Webb and Sheeran's (2006) meta-analysis suggested that the effect size of intention on behaviour albeit significant, may be smaller than correlational tests have indicated. Their analysis indicated that a medium-to-large change in intention generates a small-to-medium change in behaviour. This suggests that there are other significant factors that can be considered in addition to intention when attempting to more accurately predict or explain behaviour.

3.1.6 Additional components

Whilst Ajzen (1991) argued that TPB had to maintain a balance between maximising the predictive power of the TPB and parsimony, he welcomed additional predictors if they were shown to provide significant variance in intention or behaviour above those of the current variables. Since then, many studies have expanded the current variables and/or included additional ones, and additional predictors relevant to the assessment of the effects of drug education programs are briefly reviewed below.

3.1.6.1 Habits and past behaviours

Habit and past behaviour have been quite common additional variables in TPB studies, showing significant moderating effects between the key variables as well as explaining additional variance in intentions and/or behaviour (Norman & Conner, 2006; Orbell et al., 2001; Webb & Sheeran, 2006). These two variables have very high face value, as it is reasonable to understand how an individual who has engaged in a behaviour before, or even more so when it is done habitually, is likely to do it again with less conscious thought.

Above the main TPB variables, Orbell and colleagues (2001) found that habit explained an extra 2% of variance explained in intention of using MDMA. As a moderator in binge drinking behaviour, the frequency of past behaviour was found by Norman and Conner (2006) to attenuate the attitude-intention relationship, with attitude being a predictor of intention at _ = .63 ($p <$. 001) under high levels of past behaviour, _ = .88 ($p <$. 001) and _ = 1.13 ($p <$. 001) under medium and low levels of past behaviour respectively. In addition, Gibbons and colleagues (1998) also found that previous behaviour significantly explained 18% of the variance in behavioural willingness to engage in unsafe sex. As such, it would suggest the necessity of controlling for these past behaviour and habit in studies on health-risk behaviours, such as with substance use behaviours.

3.1.6.2 Moral norms

For behaviours that have strong perceived moral or ethical implications such as using substances, lying and stealing, moral norms have been proposed as a notable variable, explaining small increases in variance of up to five percent of intention

(Armitage & Conner, 2001; Azjen, 1991; Conner & McMillan, 1999). Moral norms have also been found to be important predictors of smoking intentions for children as young as 12 to 13 (McMillan et al., 2005).

3.1.6.3 Temporal stability

Aside from additional variables, measuring temporal stability, which is done by assessing a variable twice or more over a particular length of time, has been shown to significantly improve intention-behaviour consistency (Webb & Sheeran, 2006). Conceptually, a consistent and stable intention can be expected to resist contextual changes and lessen the effect of other mediating factors, making it a vital feature for the prediction of eventual behaviour (Ajzen, 2002b; Webb & Sheeran, 2006). In a meta-analysis of 44 studies, temporal stability was found to the be the most powerful moderating factor between the attitude-behaviour and intention-behaviour associations, explaining 14% and 6% of variance respectively (Cooke & Sheeran, 2004).

3.1.7 Summary

As discussed in the sections above, it is apparent that understanding and predicting substance use behaviours is fairly elaborate and is not as simple as merely measuring attitudinal change or recall of public service advertisements. Amongst the other health-related theoretical paradigms, the TPB puts forward a robust model involving the process of several key variables and conditions, which has been shown to be empirically supported in illustrating the complexities behind substance use behaviours.

3.2 Prototype/Willingness Model (PWM)

Unfortunately, even with additional predictors, the TPB fundamentally suffers from its reliance on an individual's capability of being rational. Ajzen and Fishbein (2005) acknowledged that the TPB may be limited in its prediction of behaviour when there is a lack of voluntary control, erroneous information, strong affect or while intoxicated. Indeed, in a hypothetical scenario where a young individual with little experience of a psychoactive substance is offered some in a party of peers who are consuming the drug, the TPB may lack substantial power in its prediction of the individual's actions. The concept of 'intention' in this scenario would be void because there would not have been any premeditated effort on the individual's part to use the substance in the first place. Furthermore, intentions have been found to have much weaker effects on risk behaviours compared with health-protective ones, when performed in social contexts (Webb & Sheeran, 2006).

An extension or variant of the TPB was thus developed by Gibbons and colleagues (1998) to counter this limitation. The Prototype Willingness Model (PWM) adopts the TRA's original variables but adds two key predictors, *prototype* and *behaviour willingness*, which are respectively defined as generalised social images of persons who perform certain behaviours and predispositions to engage in an opportunistic behaviour. The model posits itself as not contributing greatly to the prediction of behaviours that require forethought, but one that does well in predicting behaviour that occurs in reaction to unexpected encounters. For instance, the PWM studies found that whilst many young people deny having intentions to engage in risky behaviours, they are more likely to concede willingness to do so under certain

circumstances. Indeed, the model appears to target opportunistic risk behaviours in younger people who may have less firm views on certain matters such as trying cannabis for the first time; or even adults who may exploit certain situations such as not reporting a profiting bank error or cutting in line when no one is watching (Gerrard, Gibbons, Stock, Lune, & Cleveland, 2005; Gibbons, Gerrard, Blanton et al., 1998). In such situations, the PWM suggests that social context is a key influence or trigger for such opportunistic behaviours. In relation to substance use, a study on young people who used amphetamines and MDMA found that social and contextual reasons were more influential in the prediction of future use in comparison to the actual mood-altering psychoactive effects of the substances (Boys et al., 1999). Thus, one can see that while the TPB is able to capture a large portion of the important information, an extended TPB which includes concepts from the PWM model (Figure 8), may be more comprehensive in encompassing the breadth of key variables in understanding drug education effectiveness

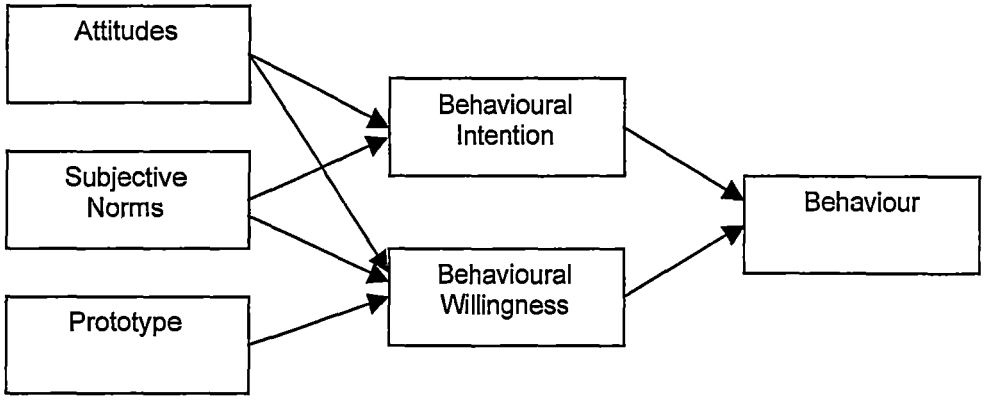

Figure 8. TPB model extended to include PWM variables.

3.2.1 Behavioural Willingness

Unlike behavioural intention which indicates one's conscious efforts in carrying out a particular behaviour, the premise of *behaviour willingness* is generally one of a predisposition to engage in a behaviour if the opportunity arises, which one may not particularly intend to dynamically pursue in the first place (Gibbons, Gerrard, Blanton et al., 1998). Behavioural willingness could thus become a particularly valuable variable in studies involving substance use behaviours in young persons who are not regular drug users, because they are likely to be exposed to opportunities to use substances in social situations rather than to actively plan to use them. Nonetheless, Gibbons, Gerrard, Ouellet and Burzette (1998) assert that whilst willingness implies less reflection than intention, it is more than a mere spur-of-the-moment decision. Instead, willingness is strongly related with a positive inclination and social acceptance.

In one study of adolescent smoking, intention and willingness have been found to be strongly correlated ($r = .69$) but after accounting for past behaviour, both variables explained a significant and independent proportion of variance in actual behaviour: willingness contributing 7% of the variance explained and intention 1% (Gibbons, Gerrard, Blanton et al., 1998). When combined, they accounted for 13% of the variance, indicating a synergistic effect of the two which was larger than what each of the variables could have achieved independently, demonstrating the value of measuring both constructs together when studying health risk behaviour.

3.2.2 Prototype

Prototypes in the PWM are conceptualised as social images about typical persons who perform a certain behaviour, for instance smokers in general, which are measured

on bipolar adjective descriptors such as "smart-foolish" or "fun-boring" (Gerrard et al., 2005). Young individuals with overall favourable images of risk behaviours tend to be more likely to be willing to engage in such behaviours, which in turn has a more likely chance of eventuating into actual behaviour (Gerrard et al., 2005; Reyna & Farley, 2006; Thornton, Gibbons, & Gerrard, 2002). Prototypes have been used successfully in PWM studies with samples of college/university students, high school students and pre-adolescents in a range of opportunistic behaviours such smoking, unprotected sex and alcohol use (Blanton et al., 2001; Gerrard et al., 2005; Spijkerman, van den Eijinden, Vitale, & Engels, 2004), explaining between 5% and 16% of variance in willingness and intention, independently of other TPB variables.

3.3 Relevance of an extended TPB model in drug education

By incorporating the key PWM components into the TPB, it is possible to synergise the strengths of both models to elucidate the effects of the different models of drug education programs (fear based vs. harm reduction) more comprehensively - with the TPB assessing the rational component of substance use behaviours, and the PWM variables address the social and contextual influences on such behaviours. Furthermore, the literature also suggests other additional factors on top of the basic TPB and PWM that may be useful in augmenting and complementing the model's explanatory and predictive capabilities.

Whilst different drug education models have divergent goals, the changes they aspire to invoke in the recipients would be those that are substantial and sustained. The extended TPB model as proposed here (Figure 9) could allow for a more thorough

understanding of the exact impacts of the different drug education strategies on the various components leading up to substance use behaviours.

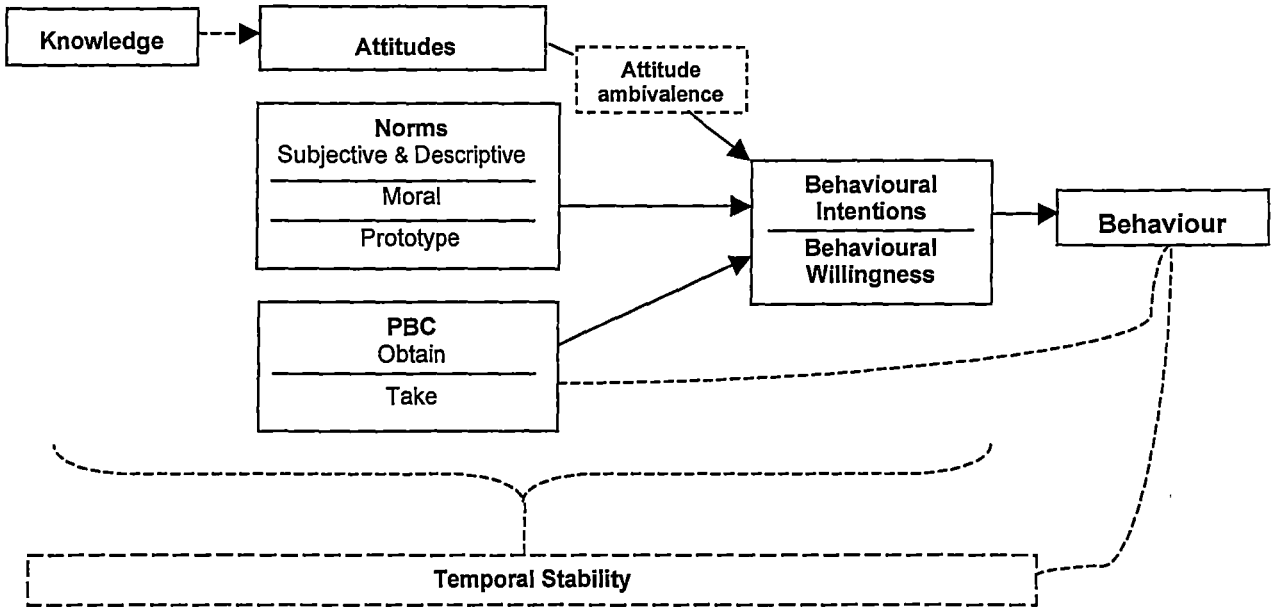

Figure 9. Proposed extended TPB model for the assessment of the effects of drug education programs.

4 Attitude and Persuasion

Whilst social cognitive models may help explain and predict behaviours, they do not address the process of change in behaviours and the relevant attitudes. Various information campaigns have gone awry due to failure to take into consideration the different dynamics of persuasion, such as the different interpretation by the recipients (Hyman & Sheatsley, 1947). Given that drug education programs aim to persuade those involved to adopt a certain position toward use of drug, it is important to further examine the mechanisms involved in this process in order to better determine the effectiveness of such drug education efforts.

4.1 Elaboration Likelihood Model - The central and peripheral route

Persuasive messages generally aim to change one's beliefs, attitudes or intentions (Fishbein & Ajzen, 1972). Arguably the most prominent paradigm of persuasion today is the Elaboration Likelihood Model (ELM) (Crano & Prislin, 2006), which claims that a message's persuasiveness and the impact of other mediating factors (e.g. source credibility, audience demographics) fundamentally depend on the motivation of the audience to process it (Petty & Cacioppo, 1986). The ELM posits that when an individual is highly motivated and able to process a message, the *'central route'* is utilised. On the other hand, when an individual is unmotivated or unable to process a message, the *'peripheral route'* is used instead. In contrast to information processed via the central route, which is believed to run on the attentive considerations of reasoning which are central to the matter, information processed via the peripheral route is instead believed to operate on simple associations or inferences tied to extraneous cues in the persuasion context. The model goes on to suggest that mediatory factors, for instance source attractiveness or message discrepancies, which may increase a message's persuasiveness via one route, could have an opposite influence through the other route, for instance using distraction (such as playing a loud background music while presenting the message) will increase the persuasiveness of a message if the audience were using the peripheral route, but would be counterproductive if the central route was used. Whilst the model has a strong empirical base, it serves more as a descriptive or predictive model than an explanatory one (Eagly & Chaiken, 1993; Petty & Cacioppo, 1986).

Petty and Cacioppo (1986) state that according to the ELM and studies applying this model, attitude change appears to be weaker, more susceptible to change and less predictive of behaviour when it is processed via the peripheral route compared to the central route. Thus in relation to drug education where the goal is typically to cause long-lasting and meaningful attitudinal as well as behavioural shifts, then it is imperative that attempts be made to ensure that the audience processes the presented information via the central route.

The model has an exhaustive list of source factors such as credibility, attractiveness; message factors such as number of arguments, discrepancy; audience factors such as demographic differences, past experience; and other variables that may mediate attitudes depending on the context of the persuasion process. For instance, a message that has high personal relevance is likely to increase an individual's motivation to scrutinise a message's merits, whilst prior knowledge of the subject matter may encourage biased examination of the newly presented information. On the other hand, source factors and other secondary variables play a more significant role, when elaboration likelihood is moderate or low (Petty & Cacioppo, 1986).

Hence while the ELM may appear unwieldy due to its numerous possible combinations of mediating factors, if used strategically and tailored for specific target audiences, the model can be a useful tool in increasing persuasiveness. As asserted earlier, in a drug education context where the preferred outcome would be substantive and enduring attitudinal as well as behavioural changes, influencing recipients to use the central route would be more effective than the peripheral route.

Among the possible steps to increase the likelihood of the audience utilising the central route include customising the message to increase personal relevance and the

sense of personal responsibility of the audience, as well as using language that is easily understood by the recipients. Nonetheless, whilst there is some degree of control in attempts to influence the persuasion route is engaged by manipulating the source or message variables, personal variables such as tolerance for ambiguity, argumentativeness, and prior knowledge may play a more prominent, and overriding role (Hale, Mongeau, & Thomas, 1991; Petty & Cacioppo, 1986).

Fishbein, Hall-Jamieson, Zimmer and von Haeften (2002) studied the perceived effectiveness of several anti-drug public service announcements (PSAs) and found that out of 30 PSAs, slightly over half were rated by participants as being more effective at reducing drug use than a control video about non-drug news production techniques. Additionally, 20% of the videos were perceived as being significantly worse than the control in their ability to reduce drug use. Thus while the study only assessed the viewers' perceived effectiveness and not actual effectiveness in terms of behaviour change, the results highlight that not all anti-drug PSAs are made equal. This study (Fishbein et al., 2002) found that the factors most highly correlated with perceived effectiveness were realism, learning and negative emotional responses. PSAs that promoted a "just say no" message were seen as less effective than those that focused primarily on the negative outcomes of drug use and those using dramatic representation. Although both types present only the negative aspects of drug use, the depth and amount of arguments presented differ. The study also found that individuals at highest risk of drug use, namely those who did not consider substance use as detrimental or unsafe, were the ones that were least likely to view the PSAs as effective overall. The researchers argue that ultimately, the effectiveness of anti-drug messages rely heavily on the desired behaviour and the target population; asserting that a particular behaviour

may be determined primarily by attitude in one population, but by social norms in another. Fishbein and colleagues (2002) concluded that preparatory research to understand the fundamental variables driving the behaviour in the target population is critical to ensure health promotion efforts and interventions succeed.

4.1.1 One-sided vs. two-sided messages

Amongst persuasion strategies, messages can be delivered with only one side of the story or from both perspectives. Findings have shown that overall, the most effective messages are two-sided with rebuttal about the discounted side, followed by one-sided messages, and that two-sided messages with no refutation are the least powerful in terms of persuasiveness (Allen, 1991; Hale et al., 1991). Strength of persuasiveness aside, Glasman and Albarracin (2006) found that one-sided information increases attitude stability as well as attitude-behaviour correlations. Nonetheless, whilst significant, message sidedness generally has relatively small effect sizes in attitude change, likely due to other meditational factors about the way that information is processed, as suggested by the ELM (Hale et al., 1991).

Whilst having a relatively small influence, presenting two-sided messages with arguments against the opposing side appears to be the most effective way of presenting drug education information. In practice, this would mean that information about substances could be delivered in a way where both the positives and negatives of drug use are exhibited, but the former are actively refuted, without being exaggeratedly so. This suggests some sort of a middle point between the harm-reduction and abstinence-based approaches, where the risks and benefits of drugs are openly discussed, yet using a systematic effort to discourage drug use.

4.1.2 Reactance to Fear-based Persuasion

Common key performance indicators that are used in mass media based anti-drug campaigns include message reach and recall of the information (Orwin et al., 2006; Pennay et al., 2006; Scottish Executive Social Research, 2002). However, these measures contribute little in the way of predicting or explaining significant behavioural changes (Brown, 2001; Hughes, 2007). If seen from a TPB perspective, recalling a message's content may influence one's attitude, but that alone will not necessarily affect intention or behaviour. Furthermore, being subjected to a health promotion message may increase attitude accessibility (the salience of an attitude in memory) but that does not mean acceptance or integration of the message. To the contrary, when bombarded with constant and numerous warnings, people may simply get jaded of such messages, or in some cases, be affected by 'boomerang effects' or 'psychological reactance', in that the exact opposite outcome of those intended by the original message have known to occur (Ringold, 2002).

Fear appeals that trigger strong emotions can be used successfully, if judged to be reasonable by the recipient, to displace positive attitudes towards a particular object or behaviour (Dillard & Anderson, 2004; Walton, 2006). On the other hand, if the message is perceived as being overinflated, the audience may judge it to be manipulative and actively reject it (Brown, 2001). Eagly and Chaiken (1993) concede that the cause of resistance that frequently occurs when persuasion is highly coercive is not yet fully understood. However, they offer that there are two major classes of theories that are accepted to be bases of such resistance, which are motivational and cognitive. In the former, reactance occurs because the ego, self or personal liberty is threatened by

change, such as when a person insists on using a particular substance because an order to cease use implies a disregard to the person's freewill. The cognitive class of reactance posits that certain attitudinal change may present a danger to the stability of numerous other cognitions within certain schemas. For instance, if a person whose significant others use substances frequently and that person was presented with the assertion that 'drug users are society's scum', the person may have to reject the notion in order to protect the integrity of the significant others cognitively. Empirically, psychological reactance has been found to differ significantly by age and gender, with the most resistance coming from people between adolescence to early adulthood, and males more than females (Bushman & Cantor, 2003; Ringold, 2002). In a study on alcohol prevention by Benley and Wu (1991), college students were shown identical information on the effects of alcohol in two conditions, with the only difference being the concluding statements: in one condition, participants were directed to not use alcohol ('high threat' condition) ; in the other, moderation was urged ("low threat" condition). Benley and Wu found that dogmatic recommendations were the least effective overall, and was simply counter-productive in both intention and behaviour to the highest risk groups. Male heavy drinkers drank significantly more when exposed to the high threat condition than the low threat condition. In regard to cannabis use, various types of fear appeals such as those that were anti-"hard" drugs; those that claimed that the use of cannabis would ultimately lead to harder drugs; and other fear-based anti-drug messages, have been shown to produce no effects among a large sample of middle and high school students (Yzer, Cappella, Fishbein, Hornik, & Ahern, 2003). The researchers proposed that messages that are incongruent with people's personal experiences may ultimately backfire.

In the context of drug education, this means that the use of fear-based persuasion has to be weighed very carefully depending on the goal of the drug education campaign, such as considering whether the aim was to reinforce non-using young people's unfavourable attitudes towards a particular substance, or encouraging active substance using teenagers to stop their drug use. Even if it was judged that it may be efficacious for a particular purpose, the degree of fear elicited should be sparingly pitched. That said, because most drug education campaigns are usually delivered indiscriminately via the mass media, limiting fear-based persuasion may be the optimum way of ensuring that the message is conveyed efficiently with minimal risk of being counterproductive.

4.2 Credibility

The ELM states that source credibility plays a much more significant role in determining persuasiveness when *elaboration likelihood* is low (Petty & Cacioppo, 1986). That is to say that when there is little motivation to scrutinise a message in detail, a recipient is more likely to be persuaded by someone who appears to be an authority figure or has high credibility rather than the actual content of the message, such as when a popular musician is featured in a public service ad discouraging drug use, without using substantial arguments. By the same token, message content plays a more prominent role in persuasion when *elaboration likelihood* is high, whilst source credibility becomes less important.

In a contemporary context concerning credibility of health promotion information on the internet, Hong (2006) found that when participants were asked to recommend tobacco cessation websites to friends and relatives, their intention to revisit the site was strongly correlated with the site's perceived credibility. Specifically, the

dimensions of depth and trust/expertise were found to be significantly linked whilst fairness and goodwill were not. However, the study's generalisability was limited in that participants were viewing emotionally neutral information instead of potentially distressing or controversial information. Fairness and goodwill may possibly play a more significant role in websites that are based on controversial topics such as substance use information. In addition to that, website design and attractiveness are also known to have a substantial influence on the intention to revisit websites (Rosen & Purinton, 2004). Websites that are hard to navigate, difficult to read and/or generally unattractive, may simply detract people from the focusing on the content or, as the ELM would suggest, reduce persuasiveness for recipients with low elaboration motivation (Petty & Cacioppo, 1986).

Nonetheless, the factor of credibility is muddied by a little understood phenomenon known as the *sleeper effect*. In a classic study by Hovland and Weiss (1951-1952), although a perceived credible source managed to change opinions more substantially than an untrustworthy source initially, after a time interval of several weeks, attitudes were found to have decreased for those who were presented with credible sources and an increase with those from the untrustworthy sources. This 'sleeper effect' appears to be only moderately reliable when the message is remembered but the source forgotten (Hovland & Weiss, 1951-1952), especially if the source is revealed after the message (Eagly & Chaiken, 1993).

Like the other mediating factors in persuasion, the role and influence of source credibility in drug education varies according to contexts and particularly with the degree of elaboration likelihood. This suggests that most effective way of presenting drug education information would be by providing substantial content and using a

credible source, which would then likely be efficacious across the different levels of elaboration likelihood. On the other hand, this also means that messages that use only a credible source but do not present solid arguments, or vice-versa, may only be persuasive for a limited range of audience.

4.3 Summary

Like the TPB, the ELM framework suggests that delivering effective drug education programs is far more complex than simply airing dramatic anti-drug advertisements via the mass media. It is apparent that there does not appear to be a one-size-fits-all approach to persuasion, or indeed drug education. A seemingly clear conclusion of the ELM literature would be that drug educators must understand the target population very well in terms of their demographics, motivations, and cognitive abilities amongst other pertinent factors. With a comprehensive understanding of the factors comes the ability to shape messages that are a good fit in terms of message complexity, message sidedness, emotional arousal and so forth to elicit a positive and long-lasting change in the target audience's attitudes and behaviours towards substance use. The risk of being unprepared or ill-informed in relation to these key factors may render the health promotion effort useless, or even counterproductive.

Thus while the ELM provides a framework to predict to some degree how persuasive fear-based drug education programs are as compared to harm-reduction ones, when combined with an extended model of the TPB, the results would be able to present a comprehensive picture about what impacts two different streams of drug education have on particular sample groups in specific contexts.

5 Potential weaknesses of the TPB and other social cognition models in the prediction of behaviour

One of the most common criticisms of social cognition research generally, and the TPB specifically, is reliance on self-report. Aside from the typical doubt about the accuracy of self-reporting, Ogden (2003) proposes that a respondent's cognitions and affect may be contaminated or manipulated simply by reflecting upon the questionnaire, especially if the target behaviour is unknown and new, for instance asking a person whether using condoms reduced sexual pleasure, when the person was not particularly aware about it before. Ogden goes on to argue that the responses to these questions could also directly influence self-reported behaviour, implying that their future behaviour would be affected simply participating in such a study.

Based on their meta-analytical findings, although Armitage and Conner (2001) concede that prediction of self-reported behaviour using the TPB model is usually more accurate than for observed behaviour, they submit that the TPB nevertheless has a medium to large effect size, explaining approximately 20% of the variance in actual behaviour. That said, Webb and Sheeran's (2006) meta-analytical results add a surprising element to the argument, finding that when intention was actively manipulated, it appeared to impact behaviour that was measured objectively twice as much as self-report, $d = +0.67$ and $d = +0.30$ respectively.

In regard to studies about controversial topics, such as sexuality or substance use, the question about responding in a socially acceptable manner often occurs. Amongst the possible distortion of responses are self-deception and impression management even under anonymous conditions (Meston, Heiman, Trapnell, & Paulhus, 1998). Various

social desirability scales have been developed and used over the years, but non-TPB related studies over large samples have shown little support of their validity or practicality (Leite & Beretvas, 2005; Piedmont, McCrae, Riemann, & Angleitner, 2000). Thus, the most pragmatic way to minimise social desirability biases in responding may still simply be to assure the participants of their anonymity and by assessing as many relevant variables as possible to attain a consistent and comprehensive result.

Whilst the TPB is by no means infallible, it appears to be one of the most reliable and sound social cognition models at this time. However, due to its underlying assumption of rational processes, the basic TPB model may not be sensitive enough to attitudinal or intentional changes in substance use behaviours as a result of a short exposure to related health promotion information. An extension of the TPB model by incorporating PWM variables may be able to explain and predict substance use behaviours among the younger population in particular more robustly.

6 Conclusion/practical implications

In a hard hitting commentary about the evaluation of the Australian Illicit Drug Diversion Initiative (IDDI), Hughes (2007) contrasted how evidence was used to design the program but political concern guided the framing of the initiative, especially in avoiding the appearance of condoning illegal substance use. Among the reasons why Hughes asserts political objectives as being inferior to evidence-based best practice, are untenable expectations and inappropriate evaluation criteria such as 'saving or changing lives' rather than reducing harm in relation to drug use. However, the author acknowledged the socio-political realities and asserted that a careful balance must be

stuck between political considerations and pragmatic evidence- based objectives in such endeavours.

On that note, it is clear that simplistic measurements of message recall and knowledge of substance effects, such as those used to evaluate the success of Australia's recent NDC, are inadequate to gauge the impact of health promotion media on substance use behaviours. In order to evaluate the impact of health promotion dissemination satisfactorily, the literature is unequivocal about the need to measure a wider range of variables that can predict target behaviours more accurately, such as those incorporated within the TPB framework. In addition to that, it is also important to assess other pertinent variables which can clarify and explain the driving factors of such behaviours in specific target populations, for example, the PWM components, particularly in younger target populations.

Specifically, substance-related health promotion information on the internet appears to be a neglected area of research. For a medium which appeals to a broad base on young people, who are typically the main target of such health promotion material, it is unfortunate that it is not studied in more depth. In an era of evidence based practice, it is imperative to examine the effectiveness of this mode of delivery of information in detail, particularly given that $32.9 million has been allocated to drug education efforts in the 2007-2011 Australian NDC. As the research reviewed above suggests, education campaigns that are currently delivered on the internet may very well increase, decrease or have no significant impact on the substance use behaviours of those viewing the sites.

Additionally, as the internet is one of the most popular sources of substance-related information today (e.g. Boyer, Shannon, & Hibberd, 2005; Brewer, 2003; Falck et al., 2004; Matthews & Bruno, 2007), it would be highly beneficial to know what

effects these materials have on the audience and how they can be refined for ongoing or future substance-related health promotion information on the internet. Thus, in light of the discussions in the sections above, it is proposed that using the extended model of the TPB detailed in this review would be an effective and comprehensive framework for measuring the practical impact of fear-based versus harm-reduction streams of drug information on the internet. Ideally, findings derived from such an investigation would be both comprehensive and highly predictive of substance use behaviour, therefore presenting pragmatic results and minimising the influence political considerations in regard to assessing the efficacy of these two approaches to drug education on young people via the internet.

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Empirical Paper

Modification of Youth Substance Use Behaviour by Fear-based versus Harm-reduction Drug Websites

Abstract

For many young persons, the internet is a primary source on information regarding substances, such as ecstasy (methyelenedioxymethamphetamine, MDMA) and gamma-hydroxy-butyrate (GHB), and is increasingly being used by agencies to disseminate education massages about drugs. Despite the numerous substance-related websites on the internet, very little is known about their impact. An extended model of the Theory of Planned Behaviour (TPB) was assembled to assess the practical impact of internet-based drug education campaigns, in particular, the differences between websites that are based on harm-reduction (i.e. which provide information about both positive and negative effects of substances, as well as means to avoid harm should people choose to use them) and fear-based (i.e. which primarily use fear appeals to discourage people from using substances) materials. To examine this question, a laboratory experiment was conducted in which drug-naïve participants aged between 18 and 25, were randomly assigned to browse through either harm-reduction or fear-based websites for information on MDMA and GHB in order to advise a hypothetical 'friend' who was intending to use these drugs. Short-term effects of treatment include sharp increases in knowledge in both site-type conditions, and a moderate decrease in attitudes, but increased behavioural willingness, to use of MDMA in the fear-based condition. After two weeks, only knowledge gain was sustained, whilst participants reading harm reduction sites showed a significant delayed reduction in willingness to use GHB. The findings suggest that young persons who have never used MDMA or GHB before, derive almost equal benefit from both fear-based and harm reduction websites. Importantly, providing harm reduction information did not increase the likelihood that consumers would use MDMA, and significantly decreased their likelihood of GHB use. The findings also supported the utility of the proposed extended TPB model in empirical assessments of drug education websites.

1.1 Major drug education philosophies

At a global level, drug education generally falls into the philosophies of a moral/abstinence-based approach to drug policy, which has the primary aim of achieving an abstinent population, or pragmatic public-health based approaches, based on the precepts of harm-reduction, that aim to reduce the net community level of morbidity associated with drug use, including among people who continue to use such substances.

Moral/abstinence approaches to drug education typically apply campaigns based on fear arousal. Such fear-based campaigns are established upon the idea that fear strongly motivates people to avoid negative consequences by altering their attitudes (Rogers, 1975). A fear-based drug education campaign would highlight negative facets of substance use to the extent of accentuating extreme but rare events, whilst minimising and ignoring any positive effects (see Figure 10 for example). A common example would be heralding cannabis as a dangerous 'gateway drug' that quickly leads to the use of other 'harder' drugs such as morphine and amphetamines (Hall & Lynskey, 2005), but not acknowledging that some find significant pleasure in its use (Chambers, Connor, & McElhinney, 2005).

This approach remains very popular as the primary framework in large campaigns such as the National Youth Anti-Drug Media Campaign (NYADMC) in the United States (Orwin et al., 2006), which is one the largest campaigns of its kind, as well as the National Drug Campaign in Australia (Pennay et al., 2006). However, evidence for the success of these fear-based campaigns have been mixed, with indications of high exposure and recall by target audiences in both campaigns; but little signs of positive behavioural change, and in fact, signs of weaker anti-drug

social norms and significantly higher rates of cannabis initiation in youth groups after exposure to the NYADMC (Orwin et al., 2006).

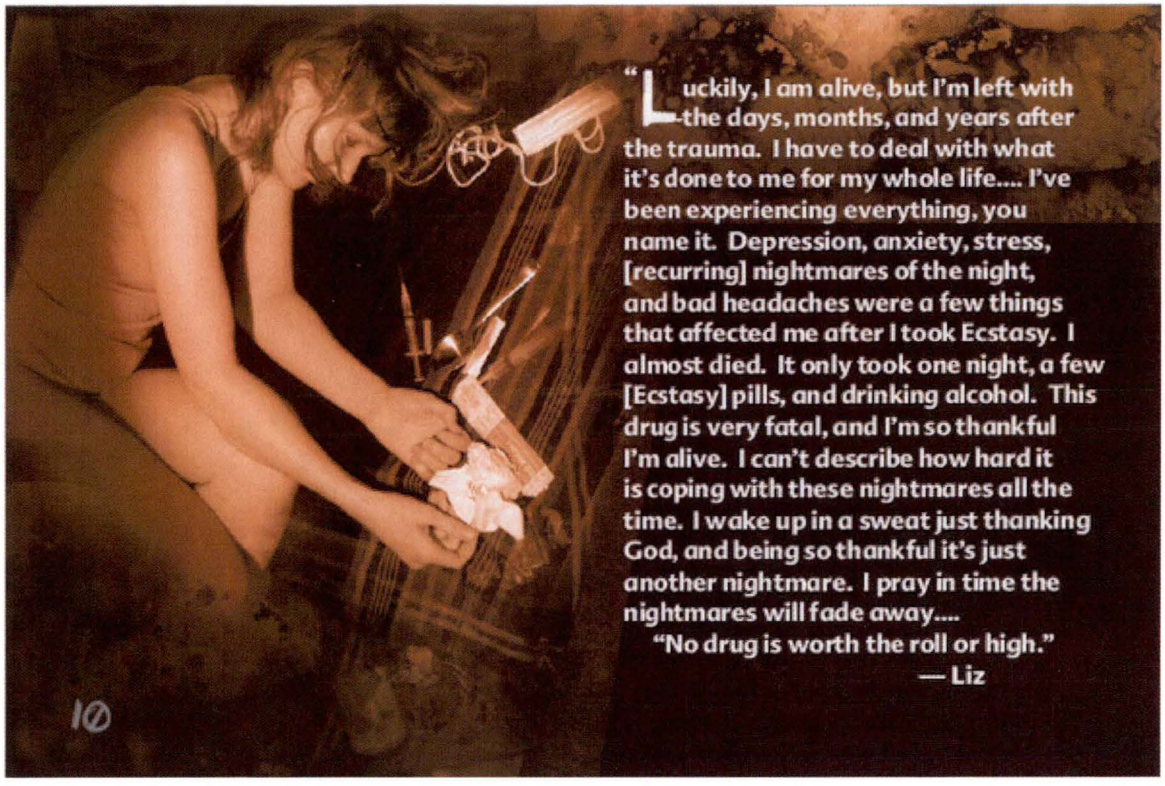


Figure 10. Example of online fear-based campaign material from www.drugfreeworld.org (Foundation for a Drug-Free World, 2007).

Harm-Reduction, which is defined as "a policy or programme directed towards decreasing adverse health, social and economic consequences of drug use even though the user continues to use psychoactive drugs at the present time (Single, 1995, p.239)", is typically acknowledged as the primary alternative to fear-based drug education policy. A typical example of harm-reduction information would include discussion about the prevalence of a particular substance, as well as descriptions of the different effects of the substance, both positive and negative (see Figure 11). Subsequently, strategies to avoid harm should people decide to use the substance would also be suggested, for instance, providing tips to avoid or to overcome an overdose. Often seen as politically controversial, harm-reduction

presents itself as a pragmatic policy that seeks to manage immediate issues but does not impose any long-term objective (House of Representatives Standing Committee on Family and Human Services, 2007; Single, 1995), and in the last several decades has slowly gained more acceptance among policy makers across the globe (e.g. Hawks & Lenton, 1995; Home Office, 2006; Ritter & Cameron, 2006).

Figure 11. Example of online harm-reduction campaign material from www.thegooddrugsguide.com (The Good Drugs Guide, 2008).

1.2 Understanding the impact of drug education campaigns by use of an extended Theory of Planned Behaviour model

The efficacy of drug education campaigns are not easily gauged as different stakeholders often use different criteria. Midford (2007) notes that key outcome measures that are not objective and behaviour-dependent can be susceptible to political and moral influences, which are usually unsupported empirically. Hawthorne (2001) argues that whilst there might be disagreements between advocates and researchers about what the key criteria should be, it would be ill-advised to disregard public health measures of substance [mis]use, such as the change in actual substance use behaviour, prevalence of drug-related diseases, accidents and/or fatalities. Nonetheless, it might not always be feasible, or indeed possible, to assess actual behavioural changes due solely to the exposure to drug education. Thus, a compromise may sometimes be necessary to take the stead of behavioural indicators.

This noted, insufficient and/or superficial measures such as attitude change, which have been shown to have indirect and complex links with behaviour (Cooke & Sheeran, 2004; Glasman & Albarracin, 2006), have commonly been used as a measure of success of campaigns. Solely measuring attitudinal change for instance, is grossly insufficient to forecast or indeed proclaim any behavioural changes. There is a substantial literature empirically demonstrating that many variables mediate the link between attitudes and behaviours. From these, several social cognition theories have been demonstrated to usefully explain and predict behaviour in a health-related context, among the more prominent are the Protection Motivation Theory (PMT), the Health Behaviour Model (HBM), the Theory of Reasoned action (TRA), the Theory of Planned Behaviour (TPB) and the Prototype/Willingness Model (PWM) (Azjen,

1991; Gibbons, Gerrard, Blanton, & Russell, 1998; Harrison, Mullen, & Green, 1992; Milne, Sheeran, & Orbell, 2000).

It would appear prudent to evaluate the outcomes or indeed successes of drug education campaigns based on an appropriate behavioural model that would ideally be able to predict and explain substance use behaviours in lieu of measuring actual behavioural changes. Moreover, the said model may then also be used prospectively in formulating health promotion materials to target key variables that are likely to affect behavioural change (Ogden, 2003; Webb & Sheeran, 2006). However, with the numerous behavioural models found in the literature, it can be an onerous task to identify one that suits the needs of studying a specific behaviour, in a particular context. Whilst, it would be misguided to assume that there is a perfect model that can explain and predict behaviours under all circumstances without fail, it would be vital to establish one that is suitable for the proposed purpose.

Unlike the PMT and HBM, which are fairly limited to health-related behaviours such as taking flu vaccinations and performing breast cancer screening, the TRA and TPB have been found applicable towards a myriad of behaviours including exercising, condom use, leisure activities, drink driving and job seeking (Hardeman et al., 2002). The TRA is derived from the premise that humans are rational beings who are strongly shaped by the information provided to them (Fishbein & Ajzen, 1975). The model posits that a voluntary behavioural intention is the best predictor of overt behaviour, and that an individual's attitudes and subjective norms would form this intention. In the context of using psychoactive substances for instance, the probability of someone intending to use a substance would be high if the person had a positive view of the drug as well as perceiving the use as socially acceptable by significant others.

Two decades after its inception, Ajzen (1991) proposed an expanded TRA, named the Theory of Planned Behaviour (TPB), by including another major factor known as perceived behavioural control (PBC), which is an individual's sense of control or command over performing an action, to overcome the original model's shortcomings in explaining and predicting non-volitional behaviours. These three factors – attitude, subjective norms and PBC – were proposed to together influence an individual's intention to carry out a particular behaviour, which in turn was hypothesised to be a good predictor of how likely it is that the actual behaviour will be executed. The TPB has been accepted in the research community as a natural replacement for the original model after being found to be superior to the TRA in numerous studies, and is arguably the most commonly used attitude-behaviour model to date (Ajzen, 1991, 2002b; Armitage & Conner, 2001; Ogden, 2003).

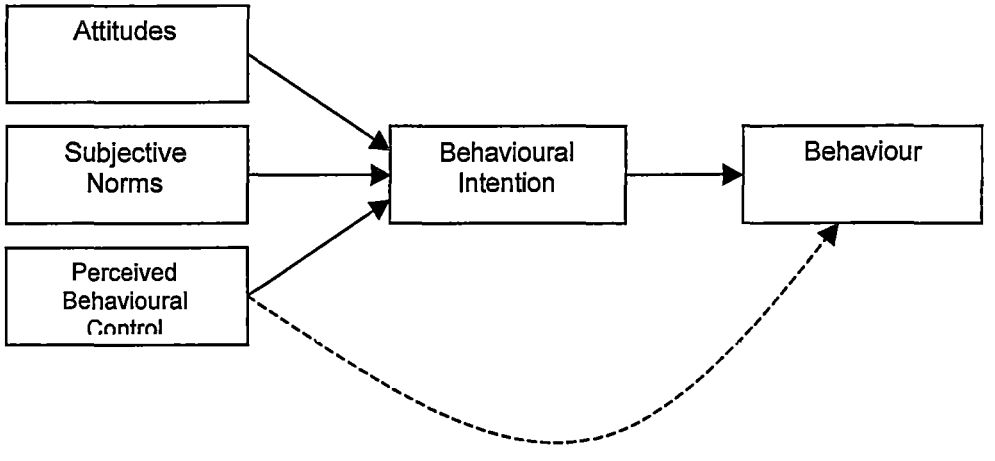


Figure 12. A visual representation of the Theory of Planned Behaviour (TPB).

In an extensive meta-analysis of 185 independent studies, Armitage and Conner (2001) found that the TPB model could account for 39% of the variance in intention, 38% for self-reported behaviour and 27% for observed behaviour over a range of target behaviours. TPB studies in the area of substance use behaviours, which

typically included minor extensions or additions in the model, support the model's efficacy in predicting medium-to-large proportion of the variance in intentions and behaviour, ranging from 17% to 88% depending on the population and the target substance (Armitage & Conner, 2001; Conner, Sherlock, & Orbell, 1998; McMillan & Conner, 2003; Orbell, Blair, Sherlock, & Conner, 2001).

Whilst the literature suggests that the original TPB model would be sufficient as a theoretical framework to base the efficacy of substance-education campaigns, large numbers of TPB studies that have incorporated additional variables in various settings, including in the prediction of substance use, demonstrate that there are potential ways of improving the predictive power of the TPB model. As the model grows and evolves, it becomes ever more important to clarify the operationalisations of the key variables as well as the methods of eliciting them.

Ajzen (2002) and Francis et al.'s (2004) proposed that the key variables of the model can be elicited via both direct (global measurements) and indirect measures (aggregations of relevant sub-components) to provide a more comprehensive assessment of the construct. Although direct and indirect measures are highly correlated, they are based on different premises of the fundamental cognitive framework. Furthermore, the efficacy of the direct and indirect measures is dependent on various factors such as the target behaviour, social desirability biases, sample population, context and operational definitions of key study variables (Armitage, 1999; Conner, Sherlock, & Orbell, 1998). For instance, if attempting to gauge people's attitudes towards immigrants, the indirect way of measuring attitude, would firstly involve asking respondents about the perceived impact of immigrants in the society. Secondly, they would be asked about the pros and cons about these impacts. This indirect manner of eliciting people's views may sometimes provide additional

information over simply asking people directly about their attitudes towards immigrants.

Whilst applying more comprehensive assessment approaches may be helpful in improving predictive power of the TPB model, it is more crucial that the variables measured match the specific target action as well as context in order to achieve strong correlations and internal reliability (Ajzen & Fishbein, 1977; Eagly & Chaiken, 1993). For instance, if there was a study on the smoking cessation in cars with young children was being conducted, a general attitudinal question such as "how appropriate is smoking?" would be insufficient. The question would need to be highly detailed such as "how appropriate is smoking in a car in the presence of young children?" The same context and specificity would then need to be applied to other variables.

Attitudes are generally accepted to be summary evaluations of a target object or behaviour, which comprise of cognitive and affective components (Ajzen & Fishbein, 1977; Eagly & Chaiken, 1993; Petty, Wegener, & Fabrigar, 1997). Nonetheless, the TPB deems that these evaluations are principally the products of cognition (Ajzen, 2001) and the proposed indirect measures of attitudes, i.e. behavioural beliefs, which is the product of outcome evaluations (e.g. "having slow reaction time is very undesirable") by salient belief strengths (e.g. "using cannabis will slow my reaction time"), primarily taps cognitive aspects of attitude, leaving the affective component of attitude largely unassessed.

Moreover, attitude has, for the most part, been conceived as existing along a bipolar spectrum of completely negative to completely positive. However, a high degree of ambivalence, defined as having inconsistent beliefs, conflicting emotions or opposing thoughts and affect (Ajzen, 2001; Eagly & Chaiken, 1993), would cause the salient attitude to be relatively malleable and unstable even if specific components of

an attitude are strong (Eagly & Chaiken, 1993; Thompson, Zanna, & Griffin, 1995). For instance, if an individual really enjoys using cannabis but at the same time believes very strongly that is it inappropriate to use it, the individual may be easily swayed either way depending on time and circumstances. Thus, measuring ambivalence in addition to attitudes proper would likely assist in elucidating the role of attitudes in a behavioural model (Petty et al., 1997).

In regard to attitude, as it is defined within the TPB, knowledge may appear very similar to the concept of behavioural beliefs. Ajzen (1991) stated that in relation to attitudes toward a particular behaviour, beliefs are linked to the outcomes or other relevant attributes of the behaviour. However, it is implied that an individual's beliefs may be merely based on a person's assumptions; whereas knowledge is defined as information that is true and based on verifiable evidence. Thus, aside from being a common measure in the outcome studies of drug campaigns, knowledge about a drug's effect may also influence behavioural beliefs (as a component of attitude) regarding the drug within the framework of the TPB.

Ajzen (1991) represents subjective norms in the TPB as the social element of perceived pressure to behave, for example, such as whether significant others approve of using alcohol regularly. In addition to direct and indirect measures of subjective norms, descriptive norms – defined as the proportion of an individual's social circle that perform the target behaviour - which captures the indirect relation between a behaviour and the referent group's approval of it, have been showed to a useful additional social predictor of intention, including in studies examining substance use behaviours (Conner et al., 1998; McMillan & Conner, 2003; McMillan, Higgins, & Conner, 2005; Rivis & Sheeran, 2003). Moral norms, defined as the perceived moral correctness of a certain behaviour, have also been proposed as a meaningful variable

in behaviours that have high perceived moral or ethical implications such as cheating, shoplifting, and substance use, explaining small increases in variance of up to five percent of intention (Armitage & Conner, 2001; Azjen, 1991; Conner & McMillan, 1999).

Perceived behavioural control (PBC) is inclusive of self-efficacy, which is the assumed controllability and degree of ease or difficulty in performing a particular behaviour, namely beliefs about the amount of influence the individual has in carrying out an action (Azjen, 1991, 2002). In a study on MDMA use, Orbell and colleagues (2001) divided PBC into two components; PBC over obtaining (PBC-obtain) the substance, as well as PBC over consuming the drug (PBC-take), which each added 7% of unique variance to the prediction of intentions. This suggests that, for substance use behaviours, Orbell and colleagues' operationalisation of PBC may evoke a broader set of controllability and self-efficacy effects within the model. This may due to the fact that the difficulty in substance use is not only limited to the use of it, but also due to its illicit nature, such substances are generally difficult to attain, which subsequently influences the likelihood of subsequent use.

In the TPB, behavioural intention is the antecedent variable of volitional behaviour which is expected to encapsulate the primary factors that direct a behaviour (Azjen, 1991). TPB studies on substance use behaviours have shown that intentions explain between 51% to 72% of variance in actual behaviour after mediation by PBC (Conner & McMillan, 1999; Johnston & White, 2003). However, Webb and Sheeran's (2006) meta-analysis found that a medium-to-large change in intention only generates a small-to-medium change in behaviour, suggesting that the effect size of intention on behaviour may be smaller than correlational tests have represented. Nonetheless, it

would appear that behavioural intention would be a crucial factor to measure in an evaluation of any drug education campaigns.

Whilst empirically shown to be fairly robust, the TPB is handicapped in certain contexts due to its fundamental premise that individuals are rational beings. To elaborate, Ajzen and Fishbein (2005) concede the that the TPB may be limited where there exists erroneous information, strong affect, intoxication or a lack of voluntary control. Moreover, intentions have been found to be less predictive of risk behaviours as compared with health-protective ones when performed in social contexts (Webb & Sheeran, 2006). Gibbons and colleagues (1998) have since developed an extension or variant of the TPB known as the Prototype/Willingness Model (PWM) which adopts the TRA's original variables but adds two key predictors, namely prototype and behaviour willingness, to fill this gap. The PWM is proposed as a model that is best suited for predicting behaviour that occurs in reaction to opportune events. In studies of health risk behaviour among young persons, it has been shown to explain between one and seven percent of the variance in behaviour after past behaviour and behavioural intention have been taken into account (Gibbons, Gerrard, Blanton, & Russell, 1998; Gibbons, Gerrard, Ouellette, & Burzette, 1998; Rivis & Sheeran, 2003b). By integrating the strengths of both the PWM and TPB, a combined model may be superior for understanding the effects of different models of drug education: while the TPB would theoretically tap the rational component of substance use behaviours, the PWM variables could additionally assess the social and contextual influences on these acts.

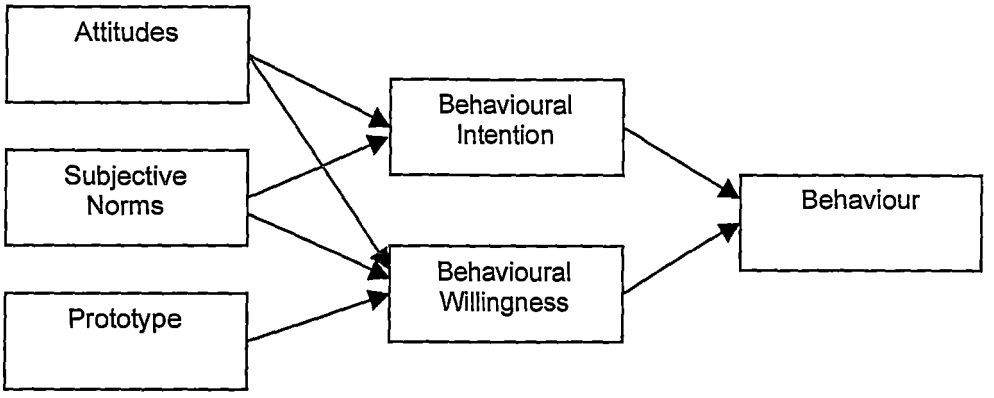


Figure 13. Theory of Planned Behaviour model enhanced to include variables from the Prototype/Willingness Model.

In the PWM, behavioural willingness is understood to be an inclination to engage in a particular behaviour at an opportune moment, which one may not particularly seek out (Gibbons, Gerrard, Blanton et al., 1998). The difference between behavioural willingness and behavioural intentions is that the former is more strongly related to positive predispositions and social acceptance, as opposed to the more active decision of the latter (Gibbons, Gerrard, Ouellette et al., 1998). For instance, a high behavioural intention in regard to substance use would be reflected in an instance where someone actively planned to smoke cannabis during the weekend, whereas in the case of high behavioural willingness, the person may not actively plan to do so, but during a night out with friends, is likely to take opportunities to use cannabis if they arise.

Another novel variable that is proposed in the PWM is prototype, which is conceptualised as a collection of social images of typical persons who carry out a particular behaviour, and is measured on bipolar adjective descriptors such as "responsible-irresponsible" or "unpopular-popular" (Gerrard, Gibbons, Stock, Lune,

& Cleveland, 2005). Positive prototypes of people performing risk behaviours tend to be associated with an increased willingness to engage in such behaviours, which subsequently predict a higher likelihood of actual behaviour (Gerrard et al., 2005; Reyna & Farley, 2006; Thornton, Gibbons, & Gerrard, 2002).

Among several other variables that have been commonly added to TPB studies in health-related areas are habit and past behaviour which have been found to be significant moderators in the model, as well as explaining additional variance in intentions, willingness and behaviour (Gibbons, Gerrard, Blanton et al., 1998; Norman & Conner, 2006; Orbell et al., 2001; Webb & Sheeran, 2006), suggesting that these variables have to be controlled for, or manipulated. Another useful consideration is the temporal stability of key variables, namely assessing the constancy of the said scores over several time intervals. This is important as consistent and stable components have been shown to exhibit more resistance to contextual changes and other mediating factors, thus increasing its predictive power (Ajzen, 2002; Webb & Sheeran, 2006). Similarly, if the model's key constructs are found to fluctuate significantly over time, behaviour predictability based on the model would be severely compromised (Webb & Sheeran, 2006).

As discussed in the literature above, it is important for drug education campaigns to be assessed objectively and empirically in terms of their efficacy in affecting behavioural outcomes. However, due to various constraints, measuring actual behavioural changes may not be feasible in practical situations. On the other hand, measuring superficial variables such as recall do not suffice for the assessment of outcome either. Fortunately, social cognition models like the TPB have been shown to be successful in bridging this gap between validity and practicality. The numerous TPB studies as discussed above have strongly suggested that incorporating additional

predictors to the basic TPB model would be advantageous for application in the area of substance use.This study proposes that a literature-based extension of the TPB model would be a more comprehensive manner of understanding and measuring the efficacy of drug education materials. The proposed model is depicted in Figure 14 below.

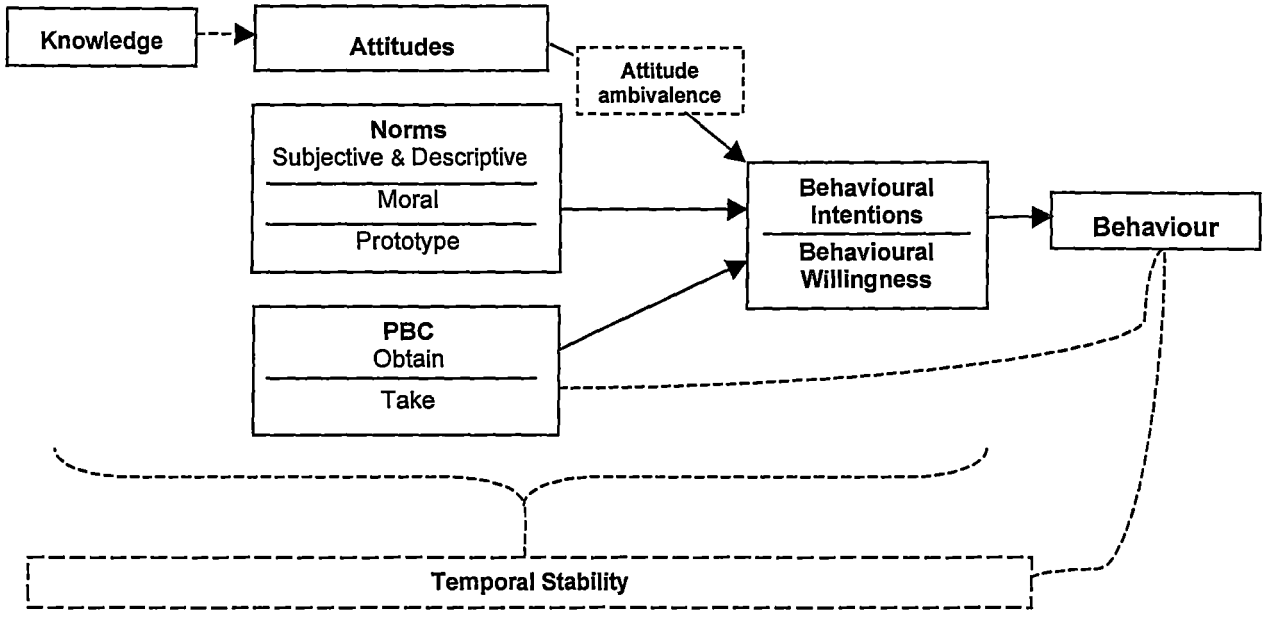


Figure 14. Proposed extended TPB model for the assessment of the effects of drug education programs.

1.3 The Elaboration Likelihood Model of persuasion

The proposed extended TPB model implies that changing a person's substance use behaviour via drug education necessarily requires a change in at least of one of the basic constructs of knowledge, attitudes, norms, perceived behavioural control and ultimately, intention and/or willingness. Persuasive messages are generally designed to change the recipient's beliefs, attitudes or intentions (Fishbein & Ajzen, 1972), and possibly the most notable persuasion paradigm is the Elaboration Likelihood Model (ELM) (Crano & Prislin, 2006).

The ELM asserts that a message's persuasiveness fundamentally depends on the motivation and capacity of the audience to process it, and is operationalised as *elaboration likelihood* (Petty & Cacioppo, 1986).The model suggests that when elaboration likelihood is high, i.e. when an individual is highly motivated and able to process a message, a proposed 'central route' of information processing is utilised. When elaboration likelihood is low, i.e. when an individual is unmotivated and/or unable to process a message, a 'peripheral route' is used instead. Petty and Cacioppo (1986) state that according to the ELM, attitude change appears to be stronger, longer lived and more predictive of behaviour when educational messages are processed via the central route as compared to the peripheral route. Thus, if the goal of drug education campaigns is to produce significant attitudinal and behavioural shifts, then it is critical to ensure that the materials are processed through the central route.

The ELM has an exhaustive list of *source* factors such as credibility, attractiveness; *message* factors such as number of arguments, discrepancy; *audience* factors such as demographic differences, past experience; and other variables that may mediate attitudes depending on the context of the persuasion process. In particular, source factors and other secondary variables play a more significant role however, when elaboration likelihood is moderate or low (Petty & Cacioppo, 1986).

A distinctive characteristic of fear-based drug-education materials is the extreme use of single-sided messages that predominantly, or even solely, describe these substances negatively. As the name implies, they attempt to elicit fear so as to discourage the audience from using these substances. Harm-reduction materials on the other hand, tend to present a more comprehensive view of drugs, including both negatives and the positives, and do not place particular value judgements on either. Several studies have shown that whilst having a relatively small influence, the most

effective persuasive messages are two-sided with rebuttal about the discounted side, followed by one-sided messages, and that two-sided messages with no refutation are the least powerful (e.g. Allen, 1991; Hale, Mongeau, & Thomas, 1991). This would imply that fear-based materials could be found as more persuasive than harm-reduction materials as the former is one-sided, whilst the latter is two-sided with no refutation.

The ELM however, elaborates the topic further by noting the interactions of message-sided with audience motivation (Petty et al., 1997), whereby when highly motivated to process the information, only argument quality influences intentions. On the other hand, under low motivation, two-sided messages with rebuttal draw more favourable intentions but argument quality has less influence. Under moderate motivation conditions, comparative messages tend to elicit more favourable scrutiny than non-comparative ones. This would suggest that if disseminating drug education indiscriminately via the mass media to audiences who may or may not be motivated to process the materials (i.e. generally under low to moderate levels of motivation to process the information), information about both the positives and negatives of drug use should ideally be presented, but with either moderate discounting of the positives effects, or restrained emphasis of the negative effects.

Fear appeals that trigger strong emotions can be a persuasive tool to displace positive attitudes towards a particular object or behaviour if judged to be reasonable by the audience (Dillard & Anderson, 2004; Walton, 2006). However, if a persuasive message is perceived as being grossly exaggerated, especially to the extent of eliciting fear, the recipient may find it manipulative and actively dismiss it (Brown, 2001). The rejection of persuasive messages, also known as psychological reactance, has been found to be more common with people aged between adolescence to early adulthood –

the prime target of drug education campaigns, and also with males more than females (Bushman & Cantor, 2003; Ringold, 2002).

The ELM asserts that source credibility plays a more significant role in affecting persuasiveness when elaboration likelihood is low (Petty & Cacioppo, 1986). When it is high, credibility plays a far smaller role because the content and merits of a message are perceived as more important than the credentials of the source. This suggests that in key target audiences, such as teenagers who may not be particularly interested in seeking drug-related information, they may be more accepting of information if they perceive the source as credible, for example, an older friend whom they think is streetwise and will tell them the bare facts; or declared 'experts' in the field, such as doctors or drug researchers.

In a non-ELM related study, Hong (2006) found that the intention to revisit tobacco cessation websites was strongly correlated with the sites' perceived credibility. In Hong's study, the dimensions of depth and trust/expertise were found to be significantly linked to intention whilst fairness and goodwill were not. The latter two dimensions may possibly play a more significant role in websites that are based on controversial topics such as substance use information. In relation to harm-reduction and fear-based drug education campaigns, if credibility was operationalised as per Hong's study, it could help clarify how audiences perceive them. Hypothetically, one could argue that credibility comes from perceived authority, and fear-based materials could attain credibility by presenting 'expert' opinions. However, harm-reduction materials could also be arguably more credible because they are more transparent and present more complete and accurate information. Nonetheless, in addition to credibility of health promotion materials on the internet, website design

and attractiveness is also found to have a substantial influence on the intention to revisit websites (Rosen & Purinton, 2004).

Overall, these frameworks suggest that there are many subtleties in drug education and that a tailored approach is very important. The literature would certainly suggest that drug educators must understand their target population well in matters including like demographics, motivations and cognitive abilities. While the extended model of the TPB might be helpful in explaining and predicting the pathways to actual behaviour, the ELM's theoretical framework of persuasion might be used to illustrate and better understand the impacts of the two different streams of drug education on particular sample groups, in specific contexts.

1.4 The internet as a primary source of information on substances for young persons

Whilst there is much research on the impact of community-based or nationwide anti-drug programs, many youth attain substance-related information through other means - and the internet is one such information pathway which has gained much popularity and impact in recent times.

A study (Brewer, 2003) on both "club drug" users (consumers of drugs such as MDMA, methamphetamine, ketamine or gamma-hydroxy-butyrate) and non-club drug users from an American university showed that 89 out of the 117 participants have searched for club drug information on the internet before. A survey of MDMA users in a United States metropolitan city by Falck, Carlson, Wang and Siegal (2004) showed that among various sources of substance-related information, 'non-government drug websites' (which were primarily harm-reduction based) ranked second only to friends as most important, although these websites were rated lower than drug use treatment programs and physicians in terms of perceived accuracy.

Interestingly, these non-government websites were rated higher than governmental sources (which were primarily fear-based) in both importance and accuracy by these participants. Furthermore, four times as many of the MDMA user sample visited the non-government drug websites as they did government web sites.

An ongoing study of the trends of MDMA and other related drugs in various Australian states (Matthews & Bruno, 2006, 2007) found that a significant proportion (45% in 2005, 36% in 2006 and 46% in 2007) of the frequent MDMA users interviewed reported having recently searched the internet for information on MDMA or other similar drugs. Out of 12 websites listed in the survey, the three most popular websites were harm-reduction websites (i.e. www.pillreports.com, www.erowid.com, and www.bluelight.com).

A qualitative study by Boyer, Shannon and Hibberd (2005) on 12 youths involved in treatment for substance use problems at health centres found that all of had used the internet to gain information about psychoactive substances before, and whilst 10 preferred non-government websites (primary harm-reduction based), only 2 accessed government anti-drug sites and/or general medical sites. All of these adolescents had modified their consumption behaviours after reviewing this information; however such responses were extremely variable, ranging from discontinuation of use of a particular drug, initiation into use of new drugs, to using this information to reduce the health risks associated with the consumption of particular drugs. These cases suggest that information about illicit drugs on the internet will not necessarily lead to an increased likelihood of use of particular drugs, but may also lead to increases in health-protective behaviours amongst consumers.

Overall, these qualitative and quantitative studies overwhelmingly suggest that existing substance consumers tend not to use fear-based websites, and are far more

responsive to harm-reduction websites. Nonetheless, it remains mostly untested as to how drug-naïve participants (individuals who have never used the target substances before) would react to these two different types of websites. They may respond in a similar manner to substance users and seemingly disregard fear-based information, or may indeed respond favourably to them because the message is congruent with their current attitudes and behaviours (Hyman & Sheatsley, 1947).

Besides gauging the preferences of audiences towards either harm-reduction or fear-based websites, it would also be important to examine how drug education websites affect the recipients. Brewer (2003) conducted a post-test only study (N = 117) where participants (comprising of both users and non-users of 'club drugs') in an experimental group were given a scenario whereby a very close friend had started using 'club drugs' such as MDMA as well as methamphetamine, and they were then asked to search the internet for information on these drugs. The experimental group was given 40 minutes to search online club drug information via several search engines, whilst the control group were asked to search for information on genetically modified foods. The results indicated that for drug-naïve participants, searching increased knowledge and made attitudes toward the target substances less negative relative to the control condition. Brewer proposed that non-users were probably more accepting of new views because they were likely to still be forming their opinions on a health behaviour that was relatively new for them.

Whilst Brewer's results (2003) showed that internet searching increased knowledge as well as attitudinal 'permissiveness' towards club drug use, it found that it did not affect 'attitudes towards future use' (a variable presented by the researcher as a form of behavioural intention). A possible explanation of these mixed outcomes may be that the study did not account for the complex association between reported

attitude and actual behaviour as discussed earlier in the social cognition models. Arguing from a TPB perspective, attitudinal items are simply not sufficient to predict behaviour, and furthermore items used in the study appeared to lack contextual specificity between each other as prescribed in the model, i.e. the items were of a general nature and was not set with a specific context or timeframe, such as "Using club drugs would be a good experience" and "The side effects of club drugs are only a minor nuisance" (cf. Ajzen & Fishbein, 1977; Eagly & Chaiken, 1993). In addition, due to Brewer's post-test only design, difficulties exist in discerning the existence of baseline differences in terms of attitudes and knowledge about the target drugs between experimental and control groups, as well the temporal stability of the identified effects on knowledge and attitudes.

1.5 MDMA and GHB: Two very different 'club drugs'

Across Western countries over the last two decades, the use of MDMA (methyelenedioxymethamphetamine, 'Ecstasy') and related drugs such as ketamine and GHB (gamma-hydroxy-butyrate) appear to have increased (Degenhardt, Copeland, & Dillon, 2005). Due to the growing presence of these substances at dance events and parties, this cluster of drugs are commonly referred to as "club drugs", "party drugs" or "designer drugs". Although there have always been difficulties in drawing strong conclusions about drugs' effects in general due to individual differences and methodological issues (Britt & McCance-Katz, 2005), research on these club drugs have been outpaced by the growth in their popularity and use (Maxwell, 2005).

Among the club drugs, MDMA is among the most popular due its availability and reputation (Australian Institute of Health and Welfare, 2005; Degenhardt et al., 2005; Maxwell, 2005). MDMA can be found in tablet or capsule form and is usually

taken orally, but is also sometimes crushed into powder form for snorting or injection. Acutely, MDMA primarily affects serotonin neurotransmission but is also known to affect noradrenergic, dopaminergic, and cholinergic activity (Britt & McCance-Katz, 2005). Among the common desired effects of MDMA use are feelings of empathy, increased energy, enhanced sociability, psychomotor drive, self-confidence, sense of well-being, positive mood, and heightened sensory awareness, whilst negative effects such as anxiety, bruxism, difficulty concentrating, disturbance of balance, hypertension and hyperthermia have been reported (Britt & McCance-Katz, 2005; B. White et al., 2006).

When compared with MDMA and the other club drugs, GHB is less well studied with most of the data originating from health services data sets, due to high levels of morbidity linked to its use (Degenhardt et al., 2005). GHB was initially used for legal medical purposes but began to be sold illegally due to its psychoactive effects. It is usually sold in liquid form and its effects are very similar to alcohol, causing feelings of euphoria, relaxation, anxiety reduction, sleep induction and increased libido. Unwanted effects such as dizziness, confusion, agitation, unconsciousness, vomiting, tremors, physical dependence, as well as central nervous system and respiratory depression are also associated with GHB use (Britt & McCance-Katz, 2005; B. White et al., 2006).

Most notably, Degenhardt, Darke and Dillon (2003) found that in a survey of 76 GHB users, slightly over half of the sample had overdosed at least once, while a third had overdosed three times or more. Accidental GHB overdosing is very dangerous and has a high potential to be fatal when coupled with vomiting, which may cause choking in one's vomit while unconscious. The commonly regarded reasons for such high levels of overdosing among GHB users are due to the difficulty

in gauging the actual dosage of a vial of GHB, as well as a very narrow range between an effective dosage and an overdose.

In relation to the utility of the TPB across different drug types, McMillan and Conner (2003) asserted that the TPB was effective in predicting the intention and use of four different substances - LSD (Lysergic acid diethylamide), amphetamine, cannabis, and MDMA. However, the findings indicated different relationships strengths between the model's components with behavioural intention as well as with actual behaviour. The predictive power of the model on actual behaviour also varied by drug type, with intention and PBC explaining up to 26% of variance for LSD use, 40% for MDMA use, 46% of variance for amphetamine use, and 70% for cannabis use. Whilst not explicitly mentioned by the researchers, it would appear that the predictive power of the model corresponds closely with the relative popularity of these drugs; with LSD being one of the least used substances in recent times, followed by amphetamines and MDMA which are both relatively equal in use prevalence, and finally cannabis, which is the most widely used illicit drug (Australian Institute of Health and Welfare, 2005). Whilst this would imply that the extended TPB model would have different level of efficacies in regard to MDMA and GHB which differs both in popularity as well health risks, it would be interesting to note if, and how, the effects of harm reduction and fear-based information would interact with these two different drug types.

1.6 Aims of the current study

Meta-analyses (e.g. Armitage & Conner, 2001; Webb & Sheeran, 2006) of social cognition models, including TPB and PWM, support the notion that a reasonable prediction of behaviour is attainable by using these models. This literature demonstrates that in addition to the pivotal behavioural antecedents such as intention

and willingness, other core components of the models such as attitudes, subjective norms, and PBC, should be assessed in order to predict behaviour more accurately.

Additionally, the TPB has been shown to benefit from the inclusion of additional variables for the prediction of health-related behaviours as discussed in the sections above. Whilst limiting the TPB to the three main variables to maintain parsimony, Ajzen (1991, pp. 199) clarified "that the TPB is in principle, open to the inclusion of additional predictors if it can be shown that they capture a significant proportion of the variance in intention or behaviour".

Thus, this study has two principal goals. The first is to establish a pragmatic and comprehensive model, primarily based on the TPB, upon which the practical impact of internet-based drug education campaigns can be assessed. Secondly, this study aims to empirically assess the efficacy of the two divergent drug-related health education website types, i.e. harm-reduction and fear-based strategies.

In regard to the first aim, the current study hypothesises that additional variables of descriptive norms, moral norms, knowledge and the division of PBC into the obtaining and consuming of the substance, would explain additional variance in behavioural intention above and beyond the three main predictors in the original TPB (Conner et al., 1998; McMillan & Conner, 2003; McMillan, Higgins, & Conner, 2005; Orbell et al., 2001; Rivis & Sheeran, 2003a). Furthermore, whilst behavioural willingness is a different construct to behavioural intention, they share common relationships with the primary predictors to some degree (Gibbons, Gerrard, Ouellette et al., 1998). It is thus hypothesised that the additional variables would explain additional variance in behavioural willingness as well.

H.1 Additional variables of descriptive norms, moral norms, knowledge and the division of PBC to PBC-obtain and PBC-take would explain additional variance in behavioural intention and in behavioural willingness over the variance explained by the three predictors, namely attitudes, subjective norms and PBC, used in the TPB.

The target sample's age group of young adults is within the age range which is most likely to exhibit psychological reactance (Bushman & Cantor, 2003; Ringold, 2002). Furthermore, due to the controversial nature of drug education and most young persons prior exposure to other fear-based campaigns, it is hypothesised that most participants would perceive fear-based websites as being glaringly exaggerated and manipulative; thus actively dismissing it (Brown, 2001), and hence, finding the harm-reduction websites significantly more credible than the fear-based ones.

H2. Harm-reduction websites will be perceived as significantly more credible than fear-based websites.

As 'club drugs' are one of the most popular drugs among the youth today (Koesters, Rogers, & Rajasingham, 2002; Maxwell, 2005), websites providing health education about MDMA would be a natural area to examine. However, due to the perception of MDMA as a far more common as well as relatively safe drug (Degenhardt et al., 2005; Nutt, King, Saulsbury, & Blakemore, 2007), it might also be useful to examine if there would be any significant difference in these health promotion campaigns on a different drug that is both uncommon and higher in risk such as the GHB (Degenhardt et al., 2003).

With the literature suggesting that the efficacy of drug education may vary tremendously depending on context as well as participant variables, this study will focus on a common target audience group of such campaigns, namely young persons who have not used certain substances before (e.g. Paglia & Room, 1999; D. White & Pitts, 1998). This would control for several possible variables, namely past behaviour and habit, as well as age. Furthermore, to control for possible differences in the ease of website navigation and attractiveness, selected existing harm-reduction as well as fear-based websites will be presented in a standardised format to maintain consistency.

In order to activate the central route of persuasion as per the ELM, a short experimental scenario will be presented to participants where they have been asked by a close friend to find more information about two particular drugs, MDMA and GHB, because the friend was deciding whether or not to try them (see Procedure for the precise scenario). It is hoped that this scenario would be sufficient to invoke personal relevance and motivation to use the central route of persuasion.

The dissemination of substance-related information has commonly been shown to have effects on participants' knowledge and attitudes (e.g. Brewer, 2003; Pennay et al., 2006). However, the TPB and PWM posit that the persuasive material needs to change behavioural intention and/or willingness to have any meaningful impact on behaviour (Ajzen, 1991; Gibbons, Gerrard, Blanton et al., 1998). Some non-internet-based drug education campaigns (e.g. McBride, Farringdon, Midford, Meuleners, & Phillips, 2004; Orwin et al., 2006) have shown changes in substance use behaviour post-campaign in either direction, which infers, based on the extended model of the TPB, intention and/or willingness were also significantly affected. The same findings could be extrapolated to online campaigns, thus suggesting that website-based

information on substance use could also have effects on the recipients' intentions and willingness, as well as their predecessor variable, attitude.

It is hypothesised that participants viewing fear-based websites would be more aware about the negative effects of MDMA and GHB, accounting for a statistically significant but small increase in knowledge for both drugs because the information presented would be fairly limited (i.e. they would have increased knowledge about negative but not positive effects). However, due to a potential lack of credibility and perceived exaggeration of the one-sided information, it is hypothesised that there will be a reverse effect of persuasion due to psychological reactance, as suggested by Ashton (1999) as well as Eagly and Chaiken (1993), for those in the fear-based group, which would significantly increase attitude scores to be more positive in regard to use of both MDMA and GHB. in light of the large moderating effects of past behaviour on the key TPB variables as well as its direct influence on intention, willingness and behaviour (Gibbons, Gerrard, Blanton et al., 1998; Norman & Conner, 2006; Orbell et al., 2001; Webb & Sheeran, 2006), it is hypothesised that that there will be a significant increase in behavioural intention and behavioural willingness, although only of small magnitudes due to the sample's salient characteristic of never having used either of these drugs before.

H3a. After exposure to fear-based websites, there will be a significant increase in MDMA-related attitudes, related knowledge, behavioural intention and behavioural willingness.

H3b. After exposure to fear-based websites, there will be a significant increase in GHB-related attitudes, knowledge, behavioural intention and behavioural willingness.

It is hypothesised that knowledge about both drugs would increase substantially after viewing harm-reduction websites because of the comprehensive, two-sided information provided in these sites. It is also hypothesised that participants viewing harm reduction websites will have significantly increased (more positive) attitudes towards MDMA after being more aware of the positive effects of MDMA use detailed in the websites (for example, feelings of well-being, confidence, euphoria and social closeness), as was demonstrated by the Brewer (2003) study. However, as GHB use is associated with substantially greater health risks (Britt & McCance-Katz, 2005; Degenhardt et al., 2003), it is hypothesised that participants in the harm-reduction group would notice this contrast between the two drugs and be more acutely aware of the dangers of GHB use, leading to a significant decrease in attitudes towards GHB after viewing the websites.

Given the sample's salient characteristic of never having used either of these drugs before, it is hypothesised viewing harm-reduction websites would have significant but small effects on behavioural intention and behaviour willingness. Specifically, it is hypothesised that that behavioural intention and willingness toward MDMA use will increase (following Brewer, 2003), whilst behavioural intention and willingness toward GHB use will decrease after treatment.

H4a. After exposure to harm-reduction websites, there will be a significant increase in MDMA-related knowledge, attitude, behavioural willingness and behavioural intention.

H4b. After exposure to harm-reduction websites, there will be a significant increase in GHB-related knowledge, but a significant decrease in GHB-related attitude, behavioural willingness and behavioural intention.

Method

1.7 Participants

A total of 80 undergraduate students at an Australian university participated in the study. Most of the participants, who were enrolled in introductory psychology units, received course credit for participating whilst those who were not enrolled in the units were reimbursed $10 for their participation. There were three inclusion criteria for the study, which were being between 18-25 years of age, ability to surf the internet and never having used ecstasy or GHB before. The sample comprised of 62 (78%) females and 18 (23%) males. The mean age of participants was 20 years (*SD* = 1.74, range: 18-25).

1.8 Procedure

Participants were recruited and allocated to groups in a counterbalanced manner to view one of two types of website (either fear-based or harm reduction) at a computer laboratory for a total of one hour to complete the first phase of the study. This initially involved completing written assessments of demographics and all baseline dependent variables (Appendix 1). Participants were then presented with a written scenario stating:-

A very close friend is thinking about trying ecstasy (MDMA) and GHB. You have agreed to look online to find out more information about these substances because you have a faster broadband access to the internet. Your close friend would really appreciate your help to find out as much as you can about ecstasy and GHB.

Participants were then asked to browse through a pre-determined list of three websites for approximately 25 minutes in total. Subsequently, they completed a post-test survey (Appendix 2) and were instructed to complete and submit a follow-up survey in two weeks time (Appendix 3). Both the post-test and follow-up survey assessed solely the variables of knowledge, attitudes, behavioural intention and behavioural willingness. For the purpose of confidentiality and to track the participants across the three questionnaires, a unique code identifier was recorded on the questionnaires.

1.9 Materials and Measures

1.9.1 Drug education websites

The six websites presented in the study had MDMA and GHB related content extracted from selected internet websites (updated as of April 17th 2007) and was placed on standardised website formats to control for website design and attractiveness (Rosen & Purinton, 2004). In order to select the websites used in this process, a group of 10 postgraduate students in psychology independently rated 19 'live' drug education websites as to their degree of fit with the approach of harm reduction or of fear-based information. From this process, the six websites with the most uniform assessment in either category were used to provide content for the websites used in the experiment.

The three websites selected for the fear-based group were from www.theantidrug.org, www.drugs.health.gov.au and www.drugstory.org. The three websites used for the harm-reduction group were from www.ravesafe.org, www.torontovibe.com and www.buzzcode.org. Website extracts are provided in Appendix 4. Efforts were made to balance the amount of information presented in each website type, however, due to its nature of presenting only limited, one-sided information, fear-based sites tended to be briefer than harm reduction sites.

1.9.2 Assessment of Extended TPB Model Variables

Seven-point Likert scales, with scores ranging from 1 to 7, were used to assess each of the constructs unless otherwise specified. Measures of behavioural intention, behavioural willingness, perceived behavioural control, direct measures of attitudes and subjective norms were operationalised in the time frame of "the next 2 months"; whilst descriptive norms used the timeframe of "the last 6 months", as this would a better representation of the factor. In contrast, the assessments of prototypes, knowledge, website credibility, moral norms, indirect measures of attitude and subjective norms had no specific time frame, because they were independent of time and would appear illogical if phrased in that manner.

The measures were presented in two major sections, the first in regard to MDMA, whilst the next in regard to GHB, in each of the three surveys. The pre-test survey included covariates such as subjective norms, descriptive norms, PBC and prototypes that were assessed solely at pre-test, because the websites are presumed to have no impact on these factors. Questions assessing Website credibility (adapted from Hong, 2006) were presented only in the post-test, after participants' exposure to the websites. TPB measures (attitudes, subjective norms, perceived behavioural control and behavioural intention) were created based on the detailed guidelines

provided in two TPB questionnaire construction manuals (Ajzen, 2002; Francis et al., 2004). Items for additional TPB variables were derived from relevant studies, as described individually below. Psychometric properties of the survey questions are provided in Table 1 below.

1.9.3 Knowledge

For the knowledge variable, a large number of facts about MDMA and GHB, which could be responded to using true or false statements, were derived from various reference sources. Any statements of fact that were controversial (i.e. not consistent across all reference sources) were removed from the question pool. The questions were then presented to 10 independent psychology postgraduates to answer and their difficulty levels were rated depending on the number of correct responses scored. The items were counterbalanced in terms of difficulty, and 15 true/false questions for both MDMA and GHB were presented in each of the three surveys (pre-test, post-test and follow-up). Ten identical questions were repeated in each of the surveys in randomised order, and there were five additional unique questions in each of the pre-test, post-test and follow-up surveys, matched for difficulty. In each survey, participants were asked to indicate whether they believed the statements to be 'true', 'false' or 'do not know'. Only correct responses were scored, and high scores indicated accurate knowledge about the said substances.

1.9.4 Attitude and attitude ambivalence

Attitudes were measured directly and indirectly. In conjunction with the Griffin formula (Costrarelli & Colloca, 2007; Thompson, Zanna, & Griffin, 1995) of assessing attitude ambivalence, direct measures of attitudes involved using 4-point unipolar split-semantic differential scales that measured positive and negative

evaluations separately on three levels: cognitively, affectively and overall. In each of the three interval points, participants were presented with two sets of the said scales, namely two positive sets and two negative sets (for example, "Considering only the positive aspects of using ecstasy in the next 2 months, and ignoring the negatives..." [positive] or "Considering only the negative aspects of using ecstasy in the next 2 months, and ignoring the positives..." [negative]). Ambivalence was tabulated as per the Griffin formula which was (P+N)/2 - |P–N|, i.e. the polarisation of the positive (P) and negative (N) judgements, minus the absolute difference between the two. Higher scores, which indicate higher attitudinal ambivalence toward the substances, are independent of the attitudinal strength.

The indirect measure of attitudes, termed as 'behavioural beliefs', was assessed through multiplying participants' ratings of 16 outcome evaluation items (e.g. Having mood swings would be *Bad-Good*) by their complementary salient belief strengths about the effects of a target drug (e.g. Using ecstasy is *Unlikely-Likely* to cause mood swings). The outcome evaluation items were scored using scales of -3 to +3. Positive scores are indicative of favourable behavioural belief toward the substance, whilst negative scores are indicative of unfavourable behavioural belief toward the substance.

1.9.5 Subjective norms

There were three direct measures of subjective norms per drug. Additionally, indirect measures of subjective norms were assessed through multiplying normative beliefs (e.g. My close friends think I should take ecstasy; *Strongly disagree-Strongly agree*) by motivation to comply (e.g. With regard to ecstasy I want to do what my close friends think I should; *Strongly disagree-Strongly agree*) in regard to four reference groups (close friends, family, partners, and health experts). The normative

belief items as well as direct measure of subjective norms were scored using scales of -3 to +3. Positive scores are indicative of perceived acceptance of use of the substance among key referent groups, whilst negative scores are indicative of perceived rejection of use of the substance among key referent groups.

1.9.6 Descriptive and moral norms

Descriptive norms of participant's close friends', partners', and family members' use of the target substance were also collected (e.g. In the last six months, how much GHB have your family members/relatives used?). Descriptive norm items were scored using scales of -3 to +3. Positive scores are indicative of higher rate of the substance use among key referent groups, whilst negative scores are indicative of lower rate of use of the substance among key referent groups. Moral norms (McMillan & Conner, 2003) were measured with a single item for each drug, where a higher score indicates stronger moral objection to drug use.

1.9.7 Perceived behavioural control

Information in regard to two types of Perceived Behavioural Control (PBC) were gathered for each drug; PBC over obtaining the drugs (PBC-obtain), as well as PBC over using the drugs (PBC-take) (Orbell et al., 2001). Three items were presented for each construct with high scores indicating strong perceived behaviour control.

1.9.8 Prototypes

Prototypes of typical persons using MDMA and GHB were assessed through Likert-type ratings using seven bipolar scales: R*esponsible-Irresponsible, Self-confident-Insecure, Assertive-Unassertive, Confused-Clearheaded, Popular-Unpopular, Immature-Mature, Sophisticated-Unsophisticated* (adapted from Gerrard

et al., 2005). Prototype items were scored using scales of -3 to +3. Positive scores are indicative of favourable views of persons using the substances, whilst negative scores are indicative of unfavourable views of persons using the substances.

1.9.9 Behavioural Intention

Behavioural intention was assessed using a single item in each of the pre-test, post-test and follow-up questionnaires for each target drug type. There was also one additional novel item in the post-survey interval which directly asked the participants' perception of how their intention to use the substances has changed after reviewing the websites, from *More unlikely to use*, to *No change*, and *More likely to use*, which had a score of -3, 0 and +3 on the scale respectively. Positive scores are indicative of perceived increase in intention to use the substances after the websites, whilst negative scores are indicative of a perceived intention reduction.

1.9.10 Behaviour willingness

Behaviour willingness was measured with two items (adapted from Gibbons, Gerrard, Blanton et al., 1998) in each of the pre-test, post-test and follow-up questionnaires for each drug type. The first type of willingness item used was "Suppose you were with some friends and one of them offered you some GHB. How likely is it that you would do each of the following. Take it and try? *Unlikely-Likely.* Decline offer? *Unlikely-Likely.*

The second willingness item type was presented in a scenario format, e.g. "After discussing the information about ecstasy from the websites with your good friend, s/he decides to try one. Your good friend says that s/he would really like you to try it with him/her.' Try it with your good friend? *Yes/No.* How difficult was it for you to make that decision? *Difficult-Easy.*" If the response to the offer was "no", then

the score for difficulty in making the decision would be reversed as an indication as a lower level of willingness. If the response was "yes" to the offer, then a straight scoring of the subsequent response would be used as indication of higher willingness.

1.9.11 Website credibility

Website credibility was measured in four dimensions using Likert-style scales, namely fairness, depth, goodwill and trust/expertise, based on previous scales developed by Hong (2006). Each dimension was assessed by three items, which were presented in a counterbalanced fashion. Example items for the respective dimensions include: "The sites provide information that is neutral" [fairness]; "The sites do not provide in-depth information" [depth]; "The sites have my interests at heart" [goodwill]; "The sites appear to be a leader in its area of specialty" [trust/expertise]. High scores indicate higher levels of perceived credibility of the websites.

1.10 Design

Overall, the study employed a 2 (Site-type: Fear-based, Harm Reduction) x 2 (Substance type: MDMA, GHB) x 3 (Time: Pre-test, Post-test, 2-week Follow-up test) three-way mixed ANOVA. Site-type was a between-subjects factor, whilst substance type and time were within-subjects factors. Dependent variables included measures of knowledge about the target drugs, attitudes toward use of the drugs, behavioural intentions and behavioural willingness toward substance use as well as perceptions of credibility of viewed sites. Perceived behavioural control (PBC), attitude ambivalence toward use of the examined drugs, subjective norms, moral norms and prototypes were also assessed as potential covariates.

1.11 Data Analysis

Missing values in the data were filled by the groups' (i.e. by site-type) median values. Three participants (i.e. one from the harm-reduction group and two from the fear-based group) failed to submit their follow-up surveys, and the data was treated as missing values (118 missing values per absent follow-up survey). In the harm reduction group, there were 502 missing values out of a total of 16880 (2.97%), and in the fear-based group, there were 458 missing values out of a total of 16458 (2.78%). One participant was excluded from further analysis due to missing responses in key outcome variables (a total of 40 missing values). The final analysis had a total of 79 participants, with 40 being in the harm reduction group, and 39 in the fear-based group.

The indirect measure of subjective norms as well as descriptive norms in regard to the referent group of "partner" [i.e. significant other] was found to have elicited a very poor response rate of only 50%, as participants were advised to not respond to this question if they were not currently in a romantic relationship, and was thus excluded from further analyses.

As shown in Table 1, there was a wide spread of knowledge scores for MDMA and GHB, within the parameters of a normal distribution. The three sub-components - cognitive, affective and overall - of attitude ambivalence had medium-to-high correlations with each other, justifying combining them into a single aggregate of attitude ambivalence. Similarly, the three sub-components of the direct measure of attitude were combined into an aggregate of direct measure of attitude in order to simplify data analysis and interpretation. These aggregated scales possessed strong internal consistency, with Cronbach α ranging between 0.87 and 0.90.

Table 1

Properties of the Developed Questionnaire at Pre-Test

Dependent Variable		N of items per drug type	MDMA Mean (SD)	MDMA Min / Max (Possible range)	MDMA Cronbach α	GHB Mean (SD)	GHB Min / Max (Possible range)	GHB Cronbach α
Knowledge		15	5.96 (2.7)	0 / 12 (0 / 15)	n/a^	4.54 (3.1)	0 / 12 (0 / 15)	0.78
e.g. Muscle tension is a common effect of using [ecstasy/GHB]. *True / False / Don't Know*								
Attitudes	Direct measures	12	-9.77 (6.9)	-18 / 13 (-18 / 18)	0.90	-11.38 (5.9)	-18 / 2 (-18 / 18)	0.87
	e.g. Considering only the positive aspects of using ecstasy in the next 2 months, and ignoring the negatives, what is your evaluation of ecstasy? *Not at all good-Extremely good; Not at all enjoyable-Extremely enjoyable; Not at all beneficial-Extremely beneficial*							
	Indirect measures	16	-56.11 (52.5)	-152 / 63 (-336 / 336)	0.80	-66.94 (52.7)	-295 / 64 (-336 / 336)	0.59
	e.g. (a) Getting arrested would be *Bad-Good*; multiplied by (b) Using ectasy in the next 2 months would get me arrested; *Unlikely-Likely*.							
	Combined	28	-65.89 (56.0)	-162 / 52 (-354 / 354)	0.81	-78.32 (55.1)	-306 / 55 (-354 / 354)	0.61
Attitude Ambivalence		6	4.68 (5.7)	-3 / 18 (-3 / 24)	0.87	3.58 (5.6)	-3 / 16 (-3 / 24)	0.88
e.g. Considering only the negative aspects of using GHB in the next 2 months, and ignoring the positives, what is your evaluation of ecstasy? *Not at all bad-Extremely bad; Not at all unenjoyable-Extremely unenjoyable; Not at all harmful-Extremely harmful.*								
Subjective norms	Direct measures	3	-7.91 (2.5)	-9 / 3 (-9 / 9)	0.87	-8.57 (1.4)	-9 / 0 (-9 / 9)	0.74
	e.g. Most people who are important to me think that *I should not-I should* use ecstasy in the next 2 months.							
	Indirect measures†	3	-36.59 (15.9)	-63 / -3 (-63 / 63)	0.41	-42.43 (18.5)	-63 / 3 (-63 / 63)	0.57
	e.g (a) My family members/relatives think I should take ecstasy *Strongly disagree-Strong agree*; multiplied by (b) With regard to ecstasy, I want to do what my family members/relatives think I should; *Strongly disagree-Strong agree.*							
	Combined	6	-44.51 (16.5)	-72 / -12 (-72 / 72)	0.38	-51.00 (18.8)	-72 / -6 (-72 / 72)	0.48
Descriptive norms		2	-5.10 (1.3)	-6 / 0 (-6 / 6)	0.37	-5.91 (0.3)	-6 / -4 (-6 / 6)	-0.04
e.g. In the last six months about what proportion of your close friends have used ecstasy? *None-All*								
Moral norm		1	4.77 (2.2)	1 / 7 (1 / 7)	n/a#	4.97 (2.1)	1 / 7 (1 / 7)	n/a#
e.g. It would be morally wrong for me to use GHB. *Strongly disagree-Strong agree.*								
Prototype		7	-6.18 (6.3)	-21 / 8 (-21 / 21)	0.68	-8.54 (6.6)	-21 / 7 (-21 / 21)	0.75
e.g. Granted that all not all people are alike, my image of the typical person who uses GHB is *Responsible-Irresponsible.*								
PBC	Take	3	19.43 (3.4)	4 / 21 (3 / 21)	0.78	20.32 (2.3)	6 / 21 (3 / 21)	0.67
	e.g. If a friend offered me ecstasy in the next 2 months and I wanted to refuse, it would be *Difficult-Easy.*							
	Obtain	3	9.82 (6.2)	3 / 21 (3 / 21)	0.92	7.08 (4.5)	3 / 21 (3 / 21)	0.90
	e.g For me to get hold of GHB in the next 2 months would be *Difficult-Easy*							
Behavioural Intention		1	1.23 (0.72)	1 / 5 (1 / 7)	n/a#	1.37 (1.36)	1 / 7 (1 / 7)	n/a#
e g. I do not plan to use GHB in the next 2 months *Strongly disagree-Strong agree.*								
Behavioural Willingness		2	3 48 (2.59)	2 / 14 (2 / 14)	0.76	3.03 (2.16)	2 / 9 (2 / 14)	0.46
e.g Suppose you were with some friends and one of them offered you some GHB How likely is it that you would do each of the following. Take it and try? *Unlikely-Likely.*. Decline offer? *Unlikely-Likely*								

Note Skewness was operationalised as a skew score that was at least three times the standard error of skew (i.e. $\gamma_1 > 0.81$)

#single item only; ^ categorical response variable; † not included in further analyses;

The direct measure of attitude was then subsequently summed with the indirect measure of attitude into an aggregated measure of attitudes as preliminary analyses found medium-to-high correlations between the direct and indirect measures. The sum of the attitude scores maintained acceptable reliability scores for MDMA ($\alpha = .81$) and GHB ($\alpha = .61$) to justify aggregation. The attitude aggregate for MDMA had a lower mean as well as minimum range than GHB, possibly explaining to some extent the higher scale reliability score of attitudes for MDMA over GHB.

The indirect measure of subjective norms had unsatisfactory alpha scores for MDMA ($\alpha = .41$) and GHB ($\alpha = .57$). Furthermore, the indirect measure was found only to have a low correlation with the direct measure in MDMA ($r = .25, p = .025$), and no correlation with the direct measure in reference to GHB use ($r = .20, p = .079$). These indicated that these measures of subjective norms should not be aggregated together (Ajzen, 2002; Francis et al., 2004), and the decision was made to exclude the indirect measure from further analysis in order to protect the integrity of the model, whilst maintaining parsimony. A key TPB study on ecstasy use by Orbell and colleagues (2001) used only two direct measure of subjective norms and no indirect measure, providing precedent for such a decision.

As for descriptive norms, the low internal consistency of scores for MDMA ($\alpha = .37$) and GHB ($\alpha = -.04$) can be explained due to the two items measuring distinctly different referent groups, namely family members and close friends who may clearly have different perspectives in relation to substance use. Responses on these scales were further compounded by floor effects, with extremely low variance in responses producing an inverted J-shaped distribution of scores. This scale was

used in further analyses because of the variable's importance in the model as well as because the responses were generally expected due to the sample characteristics.

The single moral norm item had a substantially negative skew for both MDMA ($\gamma_1 = -0.89$) and GHB ($\gamma_1 = -1.03$), indicating that more of the sample held that it was morally wrong to use either drugs. Prototypes achieved acceptable internal consistency for MDMA ($\alpha = .68$) and GHB ($\alpha = .75$), and although the scores indicated that participants generally held more negative prototypes toward people that use either drugs, there were no substantial skews in the prototype responses.

The items assessing PBC-take had satisfactory internal consistency for MDMA ($\alpha = .78$) and GHB ($\alpha = .67$), but scores were very heavily left-skewed for both MDMA ($\gamma_1 = -3.09$), and GHB ($\gamma_1 = -4.38$), indicating ceiling effects. The scores suggest that almost all participants in this sample believed that they had very strong control over the consumption of both MDMA and GHB. The assessments of PBC-obtain had high internal consistency for both drug types with Cronbach alpha values of 0.90 and 0.92 for MDMA and GHB respectively. However, PBC-obtain was heavily skewed in regard to GHB ($\gamma_1 = 0.87$), but not in regard to MDMA ($\gamma_1 = 0.52$). This suggested that a significant proportion of the sample believed that it was difficult to obtain GHB even if they wanted to.

The single behavioural intention item for both MDMA ($\gamma_1 = 4.16$) and GHB ($\gamma_1 = 3.81$) was heavily right-skewed 3.81, as well as indicated floor effects for both drugs. This meant that at baseline, the overwhelming majority in the sample had no intentions to use either drugs in the next two months. Behavioural willingness also had substantial right skews for both MDMA ($\gamma_1 = 1.98$) and GHB ($\gamma_1 = 1.96$). Furthermore, the mean score for the GHB condition had a smaller amount of variation with a more apparent floor effect in comparison to responses in relation to

MDMA. This could explain the unsatisfactory scale internal consistency for behavioural willingness in relation to in GHB ($\alpha = .46$), but not in MDMA ($\alpha = .76$).

As highlighted, a large number of scales elicited skewed responses from the sample. These skews were expected as representative of a drug-naïve sample (see Discussion), and did not necessarily imply that the scales were inadequate.

Table 2

Means, Standard Deviations and Cronbach Alphas by Website Credibility Dimensions

	N of items	Mean (SD)	Min / Max	Cronbach α
Fairness	3	12.91 (3.7)	3 / 21	0.62
Depth	3	14.20 (3.7)	4 / 21	0.71
Goodwill	3	15.89 (3.5)	3 / 21	0.73
Trust/Expertise	3	12.75 (3.5)	3 / 20	0.53
Total	12	55.75 (11.2)	19 / 82	0.83

As shown in Table 2, with the exception to the Trust/Expertise dimension, internal consistency assessments for all other website credibility dimensions in this study were consistent with those of the original study that these were derived from (Hong, 2006). The low internal consistency for the "trust/expertise" dimension may suggest a bifactorial nature of these items, as reflected by the label for this variable.

Results

1.12 Relationships between variables in the proposed extended TPB Model

In relation to MDMA use, almost all correlations between key variables achieved significance as predicted by the proposed extended TPB model (Figure 15).

Even after moderation by attitude ambivalence, attitudes had medium-to-large correlations with behavioural intention ($r = .32, p = .004$) and willingness ($r = .52, p < .001$). Subjective norms (direct) were significantly correlated with behavioural intention ($r = .62, p < .001$) and willingness ($r = .47, p < .001$) at moderate levels, whilst descriptive norms was also moderately correlated with intention ($r = .50, p < .001$) but smaller correlation with willingness ($r = .31, p = .006$).

Prototype had small but significant correlations with intention ($r = .25, p = .027$) and willingness ($r = .32, p = .004$). PBC-obtain had moderate correlations with both behavioural intention ($r = .45, p < .001$) and willingness ($r = .41, p < .001$), whilst PBC-take only had a smaller, and negative correlation with intention ($r = -.22, p = .047$). Moral norms also had negative correlations with intention ($r = -.40, p < .001$) and willingness ($r = -.34, p = .002$).

Variables that did not reach significance in correlations as predicted were between knowledge and attitudes, and between PBC-take and behavioural willingness. The lack of an identifiable relationship between knowledge and attitudes may reflect their operationalisation in this study: the constructs were assessed in such a way that whilst attitude scores were directional in terms of positive or negative towards the substance, knowledge scores were not similarly value-laden, and simply reflected the depth and accuracy of knowledge about a target substance. Thus this finding suggests that whilst knowledge may theoretically influence attitudes, a higher or lower knowledge score may not necessarily imply attitudinal direction or strength, i.e. an individual who has extensive knowledge about a said substance may equally be as likely to be positive or negative towards a said drug. Similarly, a person who has very strong attitudinal views of MDMA may or may not necessarily know a lot

of the drug. Nonetheless, the reviewed TPB studies did not include knowledge as a factor, and thus this supposition cannot be affirmed without further systematic study.

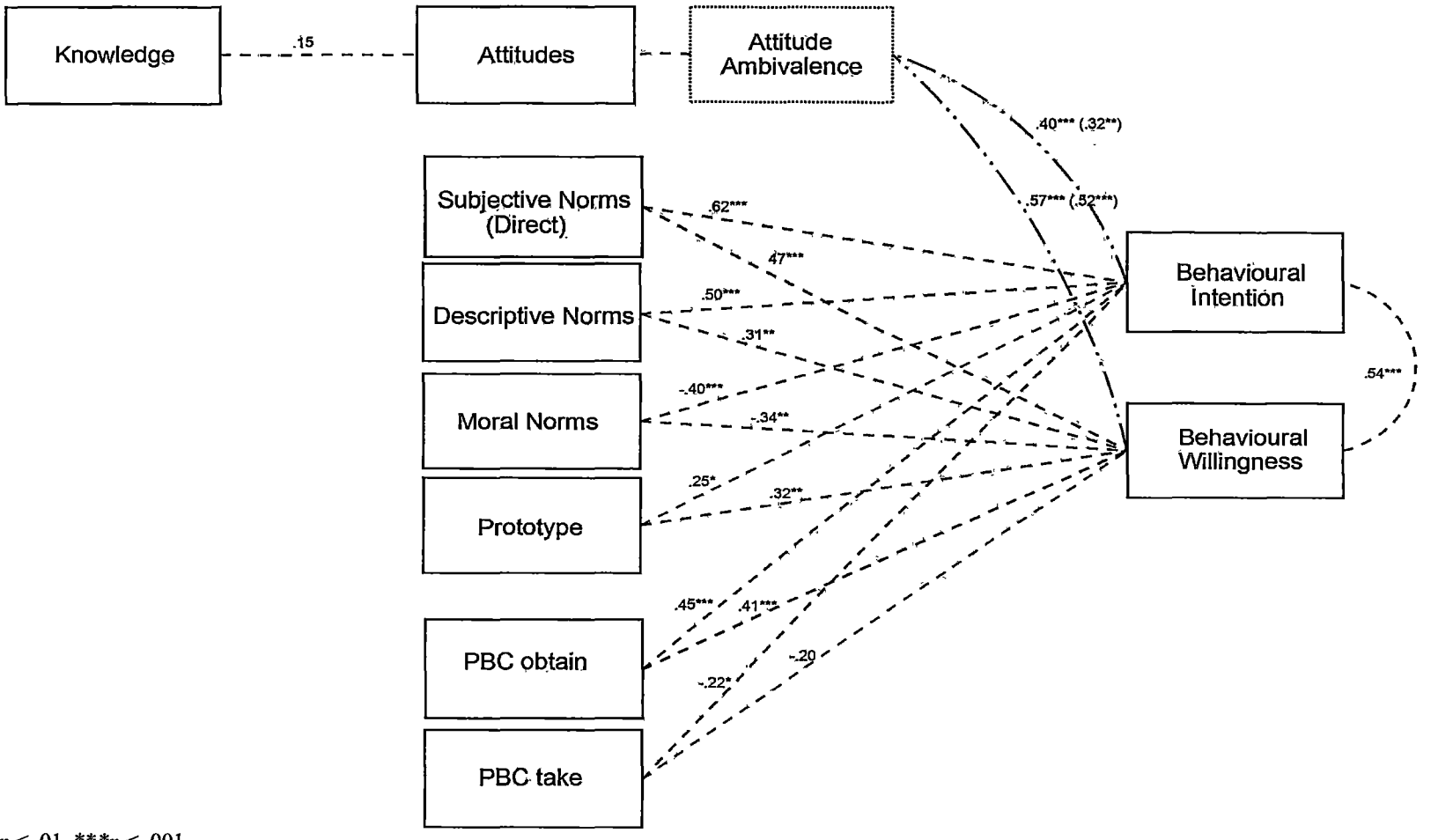
Interestingly, PBC-take, which, of the two PBC assessments included in this study, is the most consistent with the original operationalisation of PBC (e.g. Conner & McMillan, 1999), had lower correlations with the behavioural intention and willingness to use MDMA as compared to PBC-obtain. This provides evidence that underscores the importance of including PBC-obtain in drug-related TPB studies. Another important finding is that the moderate correlation of $r = .54, p < .001$ between behavioural intention and behavioural willingness indicates that while these variables share some variance, they can justifiably be considered distinctly different constructs.

Interestingly, there were many unpredicted statistically significant, albeit small in magnitude, correlations found between the variables in the proposed extended TPB model in relation to MDMA use as seen in Figure 16. Interestingly, knowledge was found to correlate with a number of the other variables, including intention directly, instead of indirectly via attitudes as inferred from the TPB model (Ajzen, 1991). Moreover, the low to moderate correlations between the normative variables, i.e. subjective norms, descriptive norms, moral norms and prototype suggest that whilst these factors are thematically similar, they are distinct constructs.

PBC-obtain and PBC-take for MDMA use were not significantly correlated, implying that both were distinctly different constructs. Of particular note, PBC-obtain and moral norms were shown to have significant correlations of moderate magnitude with many of the other variables. This suggests that these variables could be valuable additions in drug-related TPB studies.

In comparison to MDMA use, there were far fewer significant correlations between the model's key variables in relation to GHB use, as shown in Figure 17. Among those which were statistically significant, they were only of small magnitude, i.e. between attitudes and behavioural willingness, $r = .28, p = .011$; subjective norms (direct) and behavioural intention, $r = .26, p = .022$, subjective norms (direct) and willingness, $r = .27, p = .015$; descriptive norms and intention, $r = .26, p = .023$; moral norms and behavioural intention, $r = -.27, p = .015$; prototype and behavioural willingness, $r = .22, p = .050$; PBC-take and intention, $r = -.27, p = .016$. These low magnitude correlations may be due to floor effect of scores across most GHB variables (for example, 91% of the sample reported no intention to use GHB at baseline), as a reflection of GHB's relative obscurity in comparison with the well-known MDMA. This suggests that the model may have less predictive power in less-known drugs as compared to more well-known ones.

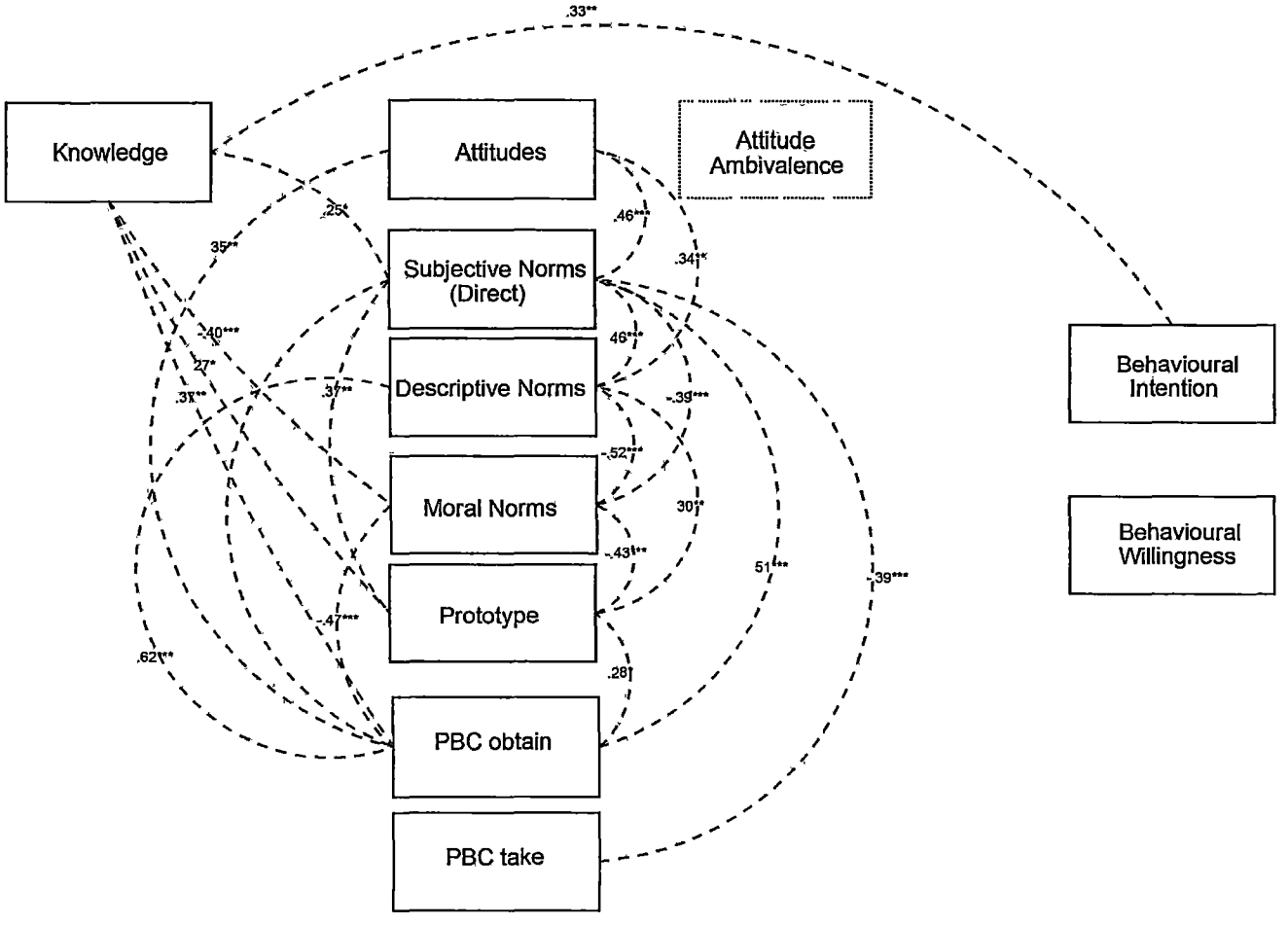
As shown in Figure 18, there were similarly fewer extra correlations between the model's components in relation to GHB use in comparison to MDMA use. Furthermore, the finding provides additional support for the treatment of PBC-take and PBC-obtain as distinct variables. Similarly, it supports the independence of the different normative constructs, such as subjective norms, descriptive norms, moral norms and prototype.



$^{*}p < .05$, $^{**}p < .01$, $^{***}p < .001$

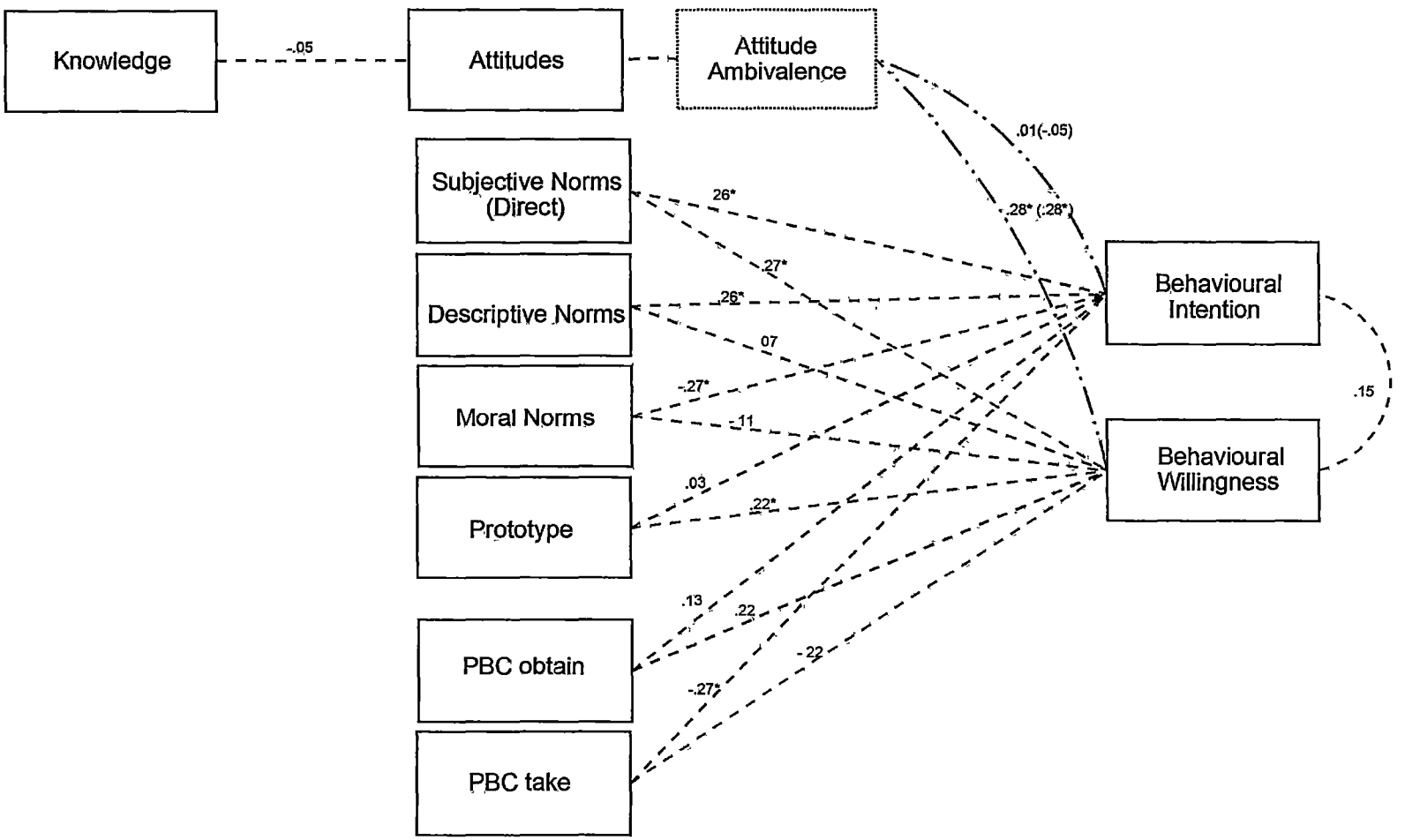
Note. Values in parentheses represents semi-partial correlations (controlling for attitude ambivalence).

Figure 15. Correlations between key variables in the proposed extended TPB model in relation to MDMA use.



*$p < .05$, **$p < .01$, ***$p < .001$

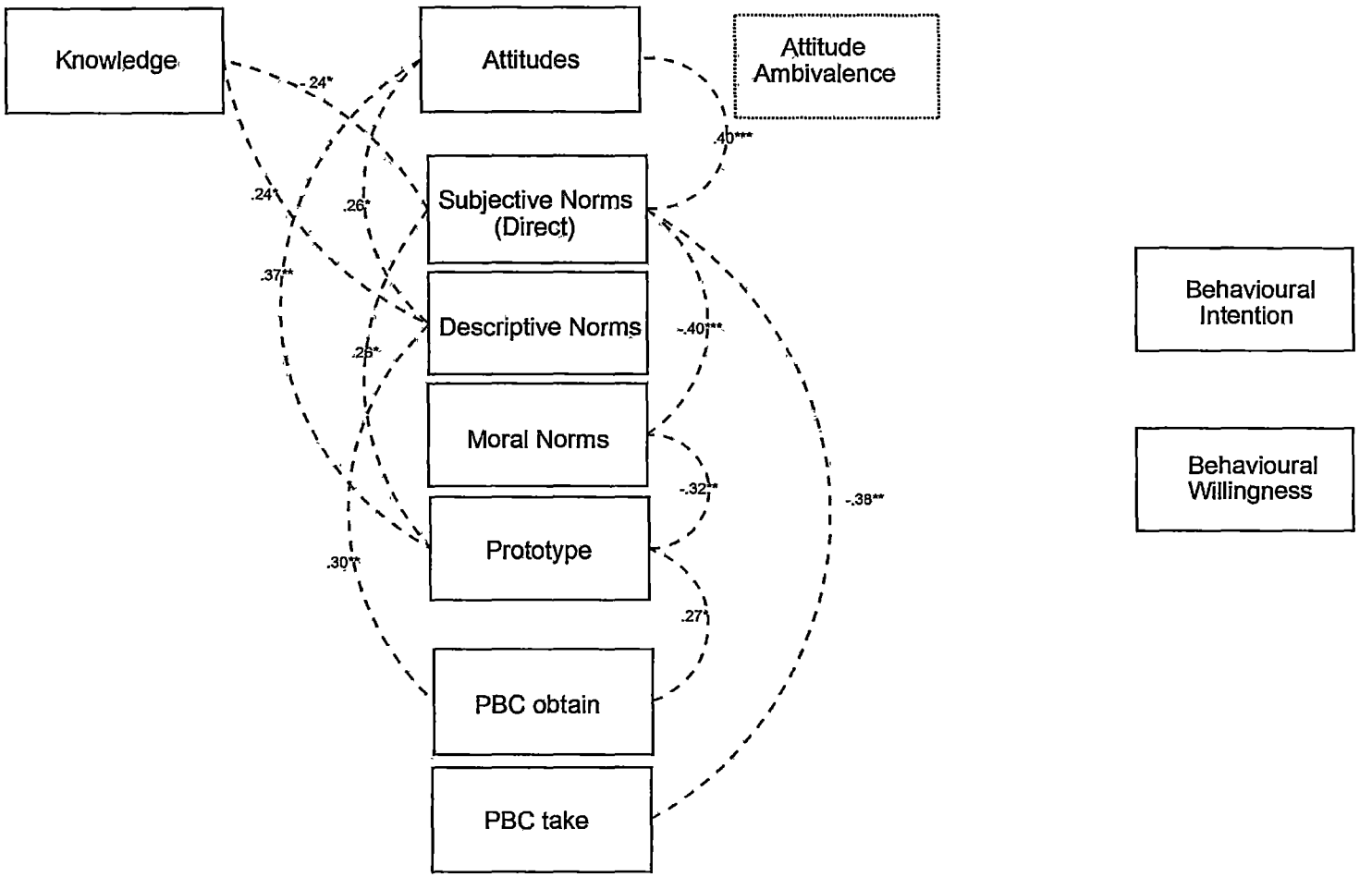
Figure 16. Additional significant correlations between variables in the proposed extended TPB model in relation to MDMA use.



*$p < .05$, **$p < .01$, ***$p < .001$

Note. Values in parentheses represents semi-partial correlations (controlling for attitude ambivalence).

Figure 17. Correlations between key variables in the proposed extended TPB model in relation to GHB use.



$^{*}p < .05$, $^{**}p < .01$, $^{***}p < .001$

Figure 18. Additional significant correlations between variables in the proposed extended TPB model with GHB use.

Using hierarchical regression models to predict behavioural intention and behavioural willingness separately, in relation to MDMA and GHB use, predictor variables were entered in two steps; where the original variables of the TPB model was entered in the first step (attitudes, subjective norms-direct and PBC-take) and all the other additional variables (descriptive norms, PBC-obtain, knowledge, moral norms and prototype) were included in the second step. It should be noted that of the two assessments of PBC used in the current study, PBC-take was used in Step 1 because it was most representative of the manner in which PBC is defined in TPB literature.

As presented in Table 3, both the original and extended TPB models performed much better in explaining the variances in behavioural intention and willingness for MDMA as compared to GHB. Whilst the models explained between 41% to 68% of the variances for behavioural intention and willingness in reference to MDMA use, only 17% to 36% of the variances in behavioural intention and willingness were explained in reference to GHB use. As a whole, the additional variables were shown to increase the variances explained by 2% to 5% above the original TPB model for MDMA use, and by 5% to 18% for GHB use. This suggests that, while still only explaining a minority of variance in behavioural intention or willingness, the additional variables may be able to increase the sensitivity of the model in drugs which are less commonly used. It should also be noted that the components appear to have different strength relationships with behavioural intention and willingness as represented by their beta scores, reinforcing that behavioural intention and willingness are distinct constructs.

Table 3

Hierarchical Regression of Pre-Test Behavioural Intention and Behavioural Willingness onto Extended TPB Model Variables for MDMA and GHB

		β			
		Behavioural Intention		Behavioural Willingness	
		Step 1 Original TPB model	Step 2 Extended TPB model	Step 1 Original TPB model	Step 2 Extended TPB model
MDMA	Attitudes	0.03	0.21	0.46***	0.44***
	Subjective norms (direct)	0.80***	0.75***	0.29**	0.21
	PBC (take)	0.11	0.08	-0.03	-0.02
	Descriptive norms		0.06		-0.01
	PBC (obtain)		0.01		0.11
	Knowledge		0.11		-0.04
	Moral norms		0.02		0.08
	Prototype		0.02		0.24*
	Model F	48.58***	18.24***	17.48***	7.50***
	Model R^2	0.66	0.68	0.41	0.46
	R^2_{change}		0.02		0.05
GHB	Attitudes	-0.08	-0.20	0.34**	0.35**
	Subjective norms (direct)	0.11	0.21	0.02	-0.05
	PBC (take)	-0.35**	-0.32**	-0.29*	-0.31*
	Descriptive norms		0.39**		-0.09
	PBC (obtain)		-0.18		0.20
	Knowledge		0.12		-0.10
	Moral norms		-0.17		0.03
	Prototype		-0.02		0.04
	Model F	5.26**	4.87***	7.17***	3.31**
	Model R^2	0.17	0.36	0.22	0.27
	R^2_{change}		0.18		0.05

Note. Moderating effects of attitude ambivalence were not included in the regression models or in subsequent analyses due to experimental power limitations.
*$p < .05$, **$p < .01$, ***$p < .001$

In relation to MDMA use, subjective norms ($\beta = 0.75, p < .001$) contributed the largest share of prediction to intention, with some assistance from attitudes ($\beta = 0.21, p = .80$) and knowledge ($\beta = 0.11, p = .19$). The other factors such as PBC-take, descriptive norms, PBC-obtain, moral norm and prototype had a beta of no more than 0.10 each in this situation ($p = .30, p = .58, p = .93, p = .83, p = .78$ respectively).

For behavioural willingness toward MDMA use however, the relationship strengths of the variables were very different. Attitudes ($\beta = 0.44, p < .001$) was strongest, followed by prototype ($\beta = 0.24, p = .025$), subjective norms ($\beta = 0.21, p = .062$) and PBC-obtain ($\beta = 0.11, p = .036$). PBC-take, descriptive norms, knowledge and moral norms had beta scores of less than 0.10 each ($p = .80, p = .95, p = .68$ and $p = .53$ respectively).

The pattern of relationship strengths was yet again different in relation to GHB use, with a wider spread of beta scores for behavioural intention. Descriptive norms ($\beta = 0.39, p = .001$) contributed most of the explanation, followed closely by PBC-take ($\beta = -0.32, p = .008$), and then attitudes ($\beta = -0.20, p = .085$). The other factors, such as subjective norms ($\beta = 0.21, p = .12$), PBC-obtain ($\beta = -0.18, p = .10$), moral norm ($\beta = -0.17, p = .12$), and knowledge ($\beta = 0.12, p = .25$), collectively assisted as well the improvement in the prediction of behavioural intention for GHB above the original TPB model (from 17% of variance explained to 36% in this measure). Prototype however, only had a very small beta score of -0.02 ($p = .83$).

In regard to behavioural willingness for GHB use, attitudes ($\beta = 0.35, p = .004$) had the strongest relationship followed by PBC-take ($\beta = -0.31, p = .014$), and PBC-obtain ($\beta = 0.20, p = .086$). The other variables such as knowledge, subjective norms, descriptive norms, moral norms and prototype did not appear to assist as much in explaining additional variance.

This finding supports H1, whereby the additional variables of knowledge, descriptive norms, moral norms, prototype, and the division of PBC to PBC-obtain and PBC-take were shown to explain additional variance in behavioural intention and behavioural willingness, in relation to both MDMA and GHB.

However, there were substantial variations in the beta scores of the model's variables between drug type and outcome variable. For instance, while PBC-obtain had moderate contributions to the prediction of behavioural intention and willingness, it was never found to be statistically significant. Similarly, knowledge and moral norms did not appear to significantly provide unique contributions in any of the regressions. In comparison, prototype significantly explained variance in behavioural willingness to use MDMA, yet gave non-significant and insubstantial explanations in the other regressions. Interestingly, no single variable from either the original or extended model was found to significantly provide unique contributions in all the regressions. These findings suggest that no single variable can be strongly recommended to be kept in, or left out, of the proposed model.

1.13 Differences in perceived credibility between harm reduction and fear-based websites

As shown in Table 4, there were no significant differences between harm reduction and fear-based websites in the dimensions of perceived fairness, depth, trust/expertise and total credibility. However, there was a significant difference between the site types in the dimension of goodwill $F(1,77) = 9.48, p = .003$, where the fear-based websites were perceived as displaying more goodwill than harm reduction sites with a difference of moderate magnitude (Cohen's $d = +0.69$). There was also a notable trend that was almost significant, in the dimension of trust/expertise between the site-types, $F(1,77) = 3.73, p = .057$, where the fear-based

sites were again perceived as having more trust/expertise than harm reduction sites at $d = +0.44$. It is likely that with an increased sample size, the result would have achieved statistical significance.

Table 4
Mean Scores and Standard Deviations of Website Credibility Scores between Site-Type

	Harm Reduction	Fear-Based	Mean difference (HR-FB)	$d_{(HR-FB)}$
Fairness	13.2 (3.3)	12.6 (4.0)	+0.6	-0.16
Depth	14.5 (3.1)	13.9 (4.3)	+0.6	-0.16
Goodwill	14.8 (3.9)	17.1 (2.6)	-2.3**	+0.69**
Trust / Expertise	12.0 (3.5)	13.5 (3.4)	-1.5	+0.44
Total Credibility	54.4 (11.9)	57.1 (10.4)	-2.7	+0.24

Note. Higher scores indicate stronger perceived credibility. Possible range is 3-21 per dimension, and 12-84 for total credibility.
*$p < .05$, **$p < .01$

The finding did not support H2 and showed that harm reduction websites were in fact not perceived by the sample as significantly more credible than fear-based websites overall, and may in fact be seen as less credible in certain dimensions.

1.14 The effects of viewing drug-education websites on key outcome variables

Table 5 summarises the findings of three-way ANOVA examining the effects of sitetype (harm reduction; fear-based) for the two different drugs (MDMA, GHB) over three points in time (baseline, immediately following the task, two weeks after the task) on the key outcome variables of knowledge, attitudes, behavioural intention and willingness. Hyunh-Feldt adjustments were applied to all analyses involving the variable of Time. There was a strong main effect of site-type for all of these variables ($p < .001$), with the fear-based group having higher scores than the harm reduction

group in all key outcome variables aside from intention. For knowledge, the fear-based condition had a mean score of 7.55 ($SD = 0.26$) and the harm reduction condition had a mean score of 7.46 ($SD = 0.25$); the mean scores of attitudes in the fear-based condition was -73.77 ($SD = 7.54$) and was -79.46 ($SD = 7.44$) in the harm reduction condition; the fear-based condition had a mean score of 3.48 ($SD = 0.27$) for behavioural willingness, and the harm reduction condition had a mean score of 2.86 ($SD = 0.26$); but for behavioural intention, participants in the fear-based group reported an average score of 1.24 ($SD = 0.10$) whilst the harm reduction group reported an average score of 1.31 ($SD = 0.09$).

There were also significant main effects of time for knowledge $F(2,154) = 113.62, p < .001$ and behavioural willingness $F(1,77) = 289.25, p < .001$, but none for attitudes and behavioural intention. As the main effects of time indicate temporal stability in the constructs, the findings suggest that attitudes and behavioural intention did not significantly alter over time whilst knowledge and behavioural willingness did; in comparison with pre-test scores, knowledge increased greatly after exposure and was sustained after two weeks, whilst behavioural willingness increased at post-test, but reversed after two weeks. Nonetheless, there were no significant interaction effects between time and site-type across all variables, suggesting that exposure to drug education websites, regardless of site-type, affected both knowledge and behavioural willingness.

The main effect of drug type was significant across three of the four variables: for knowledge, $F(1,77) = 12.03, p = .001$; attitudes, $F(1,77) = 20.15, p < .001$; and behavioural willingness $F(1,77) = 17.22, p < .001$, where scores were all higher for MDMA than for GHB. However, there was no significant difference in intention between both drugs, $F(1,77) = 1.77, p = .26$. This suggests that, overall, in

comparison to GHB, participants knew more about MDMA (GHB, $M = 7.16$, $SD = 0.20$; MDMA, $M = 7.85$, $SD = 0.21$), had less negative attitudes towards MDMA (GHB, $M = -82.09$, $SD = 5.26$; MDMA, $M = -71.14$, $SD = 5.61$), were more willing to use MDMA (GHB, $M = 2.78$, $SD = 0.15$; MDMA, $M = 3.56$, $SD = 0.26$), but had equally no intentions of using MDMA or GHB (GHB, $M = 1.22$, $SD = 0.07$; MDMA, $M = 1.33$, $SD = 0.08$).

However, these main effects found for drug type were tempered by higher order effects. While there were no significant interaction effects between drug type and site-type for knowledge and behavioural intention, there was a significant interaction between drug type and site type for attitudes: $F(1,77) = 4.03$, $p = .048$; and a trend just short of significance for such an interaction for behavioural willingness at $F(1,77) = 3.75$, $p = .057$, with observed power = .481. There were also significant interaction effects between drug-type and time for knowledge: $F(2,144) = 4.67$, $p = .013$; and willingness: $F(2,145) = 4.48$, $p = .015$, but none in attitudes and intention.

A three-way interaction was also apparent for knowledge: $F(2,144) = 5.18$, $p = .008$, but not for the other three variables. To clarify this effect, a series of break-down analyses revealed an interaction between site-type and time in regard to knowledge about MDMA: $F(2,154) = 6.75$, $p = 0.002$; but not for GHB: $F(2,153) = 0.50$, $p = .61$. As detailed in analyses below (Table 6), the significant two-way interaction reflected a greater improvement in knowledge among participants viewing harm reduction websites than those that viewed fear based websites.

In addition to that, to clarify the statistically significant two-way interactions for attitude and behavioural willingness as shown in Table 5, which were not contextualised by a higher-order effect, a series of break-down analyses were conducted.

Table 5

Main Effects and Interaction Effects of Site-Type, Drug Type and Time by Dependent Variables of Knowledge, Attitudes, Behavioural Intention and Behavioural Willingness

	Dependent Variable			
	Knowledge	Attitudes	Behavioural Intention	Behavioural Willingness
Sitetype	$F(1,77) = 1745.99^{***}$	$F(1,77) = 209.22^{***}$	$F(1,77) = 367.52^{***}$	$F(1,77) = 289.25^{***}$
Time	$F(2,154) = 113.62^{***}$	$F(2,154) = 2.12$	$F(2,154) = 1.31$	$F(2,154) = 5.36^{**}$
Time * Sitetype	$F(2,154) = 0.66$	$F(2,151) = 1.62$	$F(2,153) = 2.29$	$F(2,146) = 0.97$
Drug Type	$F(1,77) = 12.03^{**}$	$F(1,77) = 20.15^{***}$	$F(1,77) = 1.77$	$F(1,77) = 17.22^{***}$
Drug Type * Sitetype	$F(1,77) = 1.71$	$F(1,77) = 4.03^{*}$	$F(1,77) = 2.34$	$F(1,77) = 3.75^{\dagger}$
Time * Drugtype	$F(2,144) = 4.67^{*}$	$F(2,125) = 0.28$	$F(1,109) = 2.30$	$F(2,145) = 4.48^{*}$
Time * Drugtype * Sitetype	$F(2,144) = 5.18^{**}$	$F(2,125) = 0.58$	$F(1,109) = 0.29$	$F(2,145) = 1.74$

$^{*}p < .05$, $^{**}p < .01$, $^{***}p < .001$, $^{\dagger}p = .057$

A two-way ANOVA of site-type (harm reduction; fear-based) over the three points in time (baseline, immediately following the task, two weeks after the task) by drug type found that main effect of site-type was significant for attitudes toward MDMA $F(1,77) = 160.78, p < .001$ (harm reduction, $M = -76.43$, $SD = 7.88$; fear-based, $M = -65.86$, $SD = 7.99$), as well as attitudes toward GHB $F(1,77) = 244.09$, $p < .001$ (harm reduction, $M = -82.48$, $SD = 7.38$; fear-based, $M = -81.69$, $SD = 7.48$). Similarly, there were significant main effects of site type on behavioural willingness to use MDMA $F(1,77) = 195.44, p < .001$ (harm reduction, $M = 3.07$, $SD = 0.36$; fear-based, $M = 4.05$, $SD = 0.36$) and GHB $F(1,77) = 345.74, p < .001$ (harm reduction, $M = 2.65$, $SD = 0.21$; fear-based, $M = 2.91$, $SD = 0.21$). These main effects of site-type suggested that participants in the harm reduction sites had overall lower scores on attitudes and behavioural willingness in regard to both substances, as compared to fear-based websites.

There were also significant main effects of time on knowledge about MDMA, $F(2,154) = 79.72, p < .001$ (baseline, $M = 5.97$, $SD = 0.30$; post-test, $M = 9.25$, $SD = 0.19$; follow-up, $M = 8.32$, $SD = 0.28$) as well as on knowledge about GHB, $F(2,153) = 66.96, p < .001$ (baseline, $M = 4.54$, $SD = 0.35$; post-test, $M = 8.89$, $SD = 0.24$; follow-up, $M = 8.06$, $SD = 0.32$). The findings show a sharp increase in knowledge about both drugs after intervention, which appeared largely sustained two weeks later during follow-up.

Initial screening of data revealed some significant baseline differences in knowledge and behavioural intention in regard to MDMA, which may have undermined the potential to identify the hypothesised higher order effects. Analysis of covariance revealed no interactions between site-type and time after controlling for these baseline differences in regard to knowledge or behavioural intention in

regard to MDMA $F(1,76) = 0.12, p = .73$; $F(1,76) = 0.42, p = .52$ respectively, producing no change to the effects identified prior to baseline adjustment.

Despite the absence of identified three-way interactions for variables other than knowledge, analyses of cell means (Table 6) were conducted in order to clarify the main effects of time and provide more explicit detail of the individual effects of each site-type for both drug types, as this would provide practical direction as to the effect of site-type drug education websites on these key variables. As such, the analyses in Table 6 below are more practically relevant to guiding applications in formal evaluations of the effects of such internet-based drug education campaigns.

Harm reduction websites were shown to significantly increase knowledge about both MDMA, $F(2,78) = 67.79, p < .001$ and GHB, $F(2,71) = 25.48, p < .001$. Cohen's d was used to measure effect size for these changes and harm reduction sites produced substantial short term effects on increasing knowledge about MDMA (d = +2.04) at immediately after treatment, importantly this effect was still substantial after a two-week follow-up (d = +1.22). The initial, short-term effect of viewing harm-reduction websites on knowledge about GHB was not as large, d = +1.47, but at follow-up, it was at a similar level of d = +1.19. These results strongly suggest that exposure to harm reduction sites increase knowledge on drugs dramatically, and that these changes were largely sustained.

Table 6
Mean Scores, Standard Deviations, Main Effects and Effect Sizes of Site Type by Drug Type and Time

			Pre[a]	Post-[b]	Follow-up[c]	*F*	Post-hoc	$d_{(pre\text{-}post)}$	$d_{(pre\text{-}follow)}$
Harm Reduction	MDMA	Knowledge	5.3 (2.2)	9.5 (1.9)	8.3 (2.7)	67.79***	a<b*** a<c*** b>c**	+2.04	+1.22
		Attitude	-77.0 (55.8)	-77.0 (62.4)	-75.3 (61.3)	0.04	-	0.00	+0.03
		Intention	1.1 (0.2)	1.3 (1.1)	1.5 (1.4)	2.74	-	+0.25	+0.40
		Willingness	3.2 (2.4)	3.3 (2.5)	2.8 (1.8)	1.75	-	+0.04	-0.19
	GHB	Knowledge	4.8 (3.1)	8.8 (2.3)	8.2 (2.6)	25.48***	a<b*** a<c***	+1.47	+1.19
		Attitude	-81.9 (50.9)	-84.2 (59.7)	-81.4 (60.2)	0.1	-	-0.04	+0.01
		Intention	1.4 (1.4)	1.2 (0.8)	1.4 (1.3)	0.56	-	-0.18	0.00
		Willingness	3.0 (2.2)	2.8 (1.9)	2.3 (0.8)	3.37*	a>c*	-0.10	-0.42
Fear-Based	MDMA	Knowledge	6.7 (3.0)	9.0 (1.4)	8.3 (2.3)	19.65***	a<b*** a<c*** b>c*	+0.98	+0.60
		Attitude	-54.5 (54.5)	-76.4 (54.6)	-66.7 (54.9)	3.43*	a>b*	-0.40	-0.22
		Intention	1.4 (1.0)	1.2 (0.6)	1.4 (1.3)	0.67	-	-0.24	0.00
		Willingness	3.7 (2.7)	4.8 (3.5)	3.6 (2.3)	5.39**	a>b* b>c**	+0.35	-0.04
	GHB	Knowledge	4.3 (3.1)	9.0 (1.8)	8.0 (3.1)	44.37***	a<b*** a<c***	+1.85	+1.19
		Attitude	-74.6 (59.5)	-91.4 (46.1)	-79.1 (48.8)	1.94	-	-0.32	-0.08
		Intention	1.4 (1.3)	1.0 (0.0)	1.0 (0.0)	2.77	-	-0.37[†]	-0.37[†]
		Willingness	3.1 (2.2)	3.1 (2.3)	2.5 (1.1)	1.59	-	0.00	-0.35

*$p < .05$, **$p < .01$, ***$p < .001$
[†]Due to floor effect, sample-wide *SD* was used, i.e. pre = (1.4), post = (0.6), follow-up = (0.9)

While there were no effects of viewing harm-reduction websites on behavioural willingness to use MDMA, $F(2,66) = 1.75, p = .19, d = -0.19$; participants were significantly less willing to use GHB after viewing such sites: $F(2,71) = 3.37, p = .044$. The change in behavioural willingness was interesting in that post-hoc paired samples t-tests indicated that there was no significant change immediately after treatment, $d = -0.1$; but at follow-up, behavioural willingness had dropped significantly with an effect size of $d = -0.42$.

There was a non-significant trend of increasing intention to use MDMA after exposure to harm reduction websites, $F(2,63) = 2.74, p = .083$. Whilst the trend did not achieve statistical significance, the effect sizes from baseline of $d = +0.25$ at post-test and $d = +0.40$ at follow-up suggest that these are effects of moderate magnitude and may merit further consideration. In contrast, there was no effect on intention to use GHB $F(2,59) = 0.56, p = .53$, with participants generally not intending to use the drug at baseline or post-test.

Of note, there were no significant effects of exposure to harm reduction sites on attitude toward either MDMA or GHB, with participants maintaining a generally negative attitude toward both drugs.

The results thus only partially supported H4a, where after viewing the harm-reduction websites, there was a significant increase in MDMA-related knowledge but no significant changes in attitude or behavioural willingness. There was however, a moderate trend of increase in intention that did not achieve significance. H4b was also only partially supported, where there was a significant increase in knowledge about GHB together with a significant decrease in behavioural willingness (apparent only at follow-up) to use the drug after treatment in the harm reduction condition.

However, no significant changes in attitude or behavioural intention toward GHB use were observed.

Fear-based websites were also shown to significantly improve knowledge in regard to both MDMA, $F(2,71) = 19.65, p < .001$ and GHB, $F(2,76) = 44.37, p < .001$. There was a larger effect size of exposure to fear-based sites on knowledge over time in relation to GHB, $d = +1.85$ in comparison to baseline at post-test and $d = +1.19$ at follow-up, than for MDMA, $d = +0.98$ at post-test and $d = +0.60$ at follow-up.

Additionally, fear-based sites significantly affected attitudes toward MDMA, $F(2,73) = 3.43, p = .040$, as well as behavioural willingness toward using the drug, $F(2,76) = 5.39, p = .006$. Interestingly, these effects were in the opposite direction. Post-hoc paired samples t-tests showed that these effects were only significant in the short term, with statistically significant increases between baseline and post-test which were not retained at follow-up. Exposure to fear-based sites produced a more negative attitude toward ecstasy in comparison to baseline at post-test, $d = -0.40$, but not in follow-up, $d = -0.22$. While trends were in a similar direction in regard to attitudes toward GHB, these were not statistically significant.

The effect on MDMA willingness however was pronounced in the other direction to attitudes, namely where immediately after treatment to fear-based sites, participants significantly increased their willingness to use MDMA by $d = +0.35$, however after two-weeks this had returned to baseline levels ($d = -0.04$). This pattern of change in MDMA behavioural willingness may imply psychological reactance (see Discussion) to the fear-based sites immediately after exposure, but that the reactance was short-lived. There were no statistically significant effects of viewing fear-based sites in relation to willingness to use GHB.

There was a very low degree of willingness to use either MDMA or GHB among participants at baseline (Table 1), and there were no statistically significant changes to this following viewing of fear-based websites. This noted, viewing fear-based websites reduced intention to use GHB at the trend range of significance, $F(1,38) = 2.77, p = 0.10$. Whilst the trend did not achieve statistical significance, there were small effect sizes of $d = -0.37$ at post-test, retained at follow-up, and, notably, *all* participants in this group reported the lowest level of intention to use GHB.

H3a was partially supported by the findings whereby exposure to fear-based websites significantly increased MDMA-related behavioural willingness (although only short-term) and knowledge as hypothesised. However, the significant short-term decrease in attitudes toward MDMA use as well as no change in intention was contrary to the hypothesis. Similarly, H3b was only partially supported with only a significant increase in knowledge about GHB after treatment in the fear-based condition as hypothesised, whilst there were no significant changes in attitudes, intention or willingness. Furthermore, there was a moderate but non-significant trend of decrease in behavioural intention and willingness toward GHB use at follow-up that was contrary to the hypothesis.

In addition to these main findings, when participants were asked directly about the perceived effect of viewing the websites on their intentions to use the target substances, there was a significant difference between the drug types $F(1,77) = 4.74$, $p = .033$, with participants perceiving themselves as having a reduction in intention to use GHB by a marginal mean score of -1.82 ($SD = 0.15$), as compared to -1.54 ($SD = 0.16$)for MDMA use (out of a possible range of -3 to +3). There were however, no significant main effect of site-type $F(1,77) = 0.22, p = .64$ (with a

marginal mean score of -1.75 in the harm reduction condition vs. -1.62 in the fear-based condition); and no interaction effects between site-type and drug type, $F(1,77) = 0.05, p = .82$. Participants in both site-type conditions significantly perceived themselves as being less likely to use both drugs after viewing the websites, with one-sample t-tests for: harm reduction condition and MDMA with $t(39) = -6.79, p < .001$, ($M = -1.63$, $SD = 1.5$); harm reduction and GHB with $t(39) = -8.47, p < .001$ ($M = -1.88$, $SD = 1.4$); fear-based group and MDMA with $t(38) = -7.05, p < .001$ ($M = -1.46$, $SD = 1.3$); as well as fear-based group and GHB with $t(38) = -8.59, p < .001$ ($M = -1.77$, $SD = 1.3$). This suggests that drug-naïve audiences believe that drug education websites, both fear-based and harm reduction, have a deterrent effect of substance use intentions.

Discussion

There were two key aims of the current study. Firstly, to establish a pragmatic and comprehensive TPB-based model that could be used to assess the practical impact of drug education campaigns, including those through the medium of the internet. Secondly, the study aimed to subsequently use the proposed model to compare the efficacy of fear-based and harm reduction-based drug education websites in changing drug-related health behaviours.

1.15 The efficacy of the extended TPB model

In order to evaluate the utility and adequacy of any drug-education approach, it is crucial to assess pragmatic outcome measures such as behavioural indicators (Hawthorne, 2001; Midford, 2007). However, this is sometimes impractical or unfeasible in reality due to limitations in resources and ethical challenges. In lieu of measuring actual behaviour, intention and willingness have been proposed as strong

predictors of substance use behaviour. Specifically, behavioural intention has been shown to explain between 51% and 72% of variance in actual substance use behaviours after mediation by PBC (Conner & McMillan, 1999; Johnston & White, 2003). Furthermore, behavioural willingness has been shown to explain additional variances of between 1% to 7% in health risk behaviours, after behavioural intention and past behaviour have been accounted for (Gibbons, Gerrard, Blanton et al., 1998; Gibbons, Gerrard, Ouellette et al., 1998). These suggest the value of measuring as well as predicting these variables in the evaluation of drug education interventions.

In this study, the range of variances explained in the substance use intention and willingness by the original TPB components varied quite substantially from moderate (17%) to large (66%). For MDMA, a drug used by approximately 22% of Australians in the 20-29 age group (Australian Institute of Health and Welfare, 2005), the original TPB components explained an adequate amount of variance in behavioural intention and willingness to use the drug (66% and 41% of variance explained respectively). By contrast, in regard to the less prevalent drug GHB, the TPB variables were less adequate in predicting intention and willingness, explaining 17% and 22% of variance in these measures respectively. Whilst the results are within the range of variance explained in other TPB studies (Armitage & Conner, 2001; Rivis & Sheeran, 2003a), this suggests that the efficacy of the TPB model for predicting behaviour is dependent on substance type.

The inclusion of the extra variables into this theoretical framework was successful in explaining 2% to 18% additional variance beyond that from traditional TPB predictors in behavioural intention and an additional 5% variance in behavioural willingness. This improvement was modest for MDMA (a 2% variance increase, to a total of 68% of variance in behavioural intention). In contrast, this was more

substantial for GHB, doubling the amount of variance explained by TPB parameters alone (by 18% to 36%). The disparity may be due to GHB's relative obscurity, indicating that an individual's behavioural intention may be notably influenced by additional factors such as descriptive norms, PBC-obtain, knowledge and moral norms, in addition to well-recognised factors such as attitude, subjective norm and PBC-take, when a drug is not well-known. On the other hand, in regard to behavioural willingness, the additional variables explained 5% additional variance in willingness beyond TPB variables for both drugs (to a total of 46% of variance explained in willingness to use MDMA and 27% for GHB).

The results that show both the original TPB model and the extended TPB model explaining more variance in behaviour intention and willingness to use MDMA as compared to GHB is congruent with Conner and McMillan's (2003) findings on the TPB's efficacy across four substance types; whereby the predictive power of the model appeared to correspond with the relative popularity of these drugs (i.e. explaining up to 26% of variance for LSD use, 40% for MDMA use, 46% of variance for amphetamine use, and 70% for cannabis use). It is possible that a similar effect could be elicited by using the drug education websites as a means to increase awareness about the target substances, and thus causing the participants' responses in relation to the model's variables to become firmer and more defined. This might subsequently lead to an increase in the model's explanatory and predictive power after treatment. However, due to the study's design, not all variables were measured at all time intervals, and this supposition could not be tested.

Ajzen (1991) acknowledged that the TPB was open to the inclusion of additional variables, but emphasised that parsimony in measurement should remain a

key consideration. The findings of the current study suggest that there is some justification to include additional variables in studies that are intent on scrutinising the precise interactions of these different factors in influencing behavioural intention and willingness of substance use. That said, given that the increase in explanatory power comes at the expense of parsimony and additional participation burden, the findings of the current study suggest that the use of additional factors beyond TPB variables may be of most value when used in studies about substances that are not well known, such as GHB.

However, the present results make it difficult to provide general statements about which of the additional – or indeed which of the original TPB variables - was useful or not. As seen in Table 3, all individual variables fluctuated in their independent explanatory power quite dramatically by drug type and dependent variable. For example, when the extended TPB model was entered in the hierarchical regression, subjective norms showed a large beta score ($\beta = 0.75, p < .001$) in the prediction of intention toward MDMA use; moderate beta scores for intention toward GHB ($\beta = 0.21, p = .12$) and behavioural willingness toward MDMA use ($\beta = 0.21, p = .062$); but only a small beta score in willingness toward GHB use ($\beta = -0.05, p = .71$). The other components also had very different relationship strengths in each scenario.

Among the highlights were PBC-obtain, which was not found to be statistically significant on its own, yet made moderate contributions in the extended model to the prediction of behavioural intention toward GHB use, as well as behavioural willingness to use both MDMA and GHB. Knowledge and moral norms likewise did not appear to provide unique contributions in any of the regressions. In contrast, prototype significantly explained variance in behavioural willingness to use

MDMA, but played a negligible role in the other regressions. Interestingly, no single variable from either the original or extended model was found to significantly provide unique contributions in all the regressions. These findings suggest that no single variable can be strongly recommended to be kept in, or left out, of the proposed model. However, as seen in the findings, it should be considered that the attenuated range in responses from a drug-naïve sample due to the skewed responses and floor effects may have reduced potential correlations in the model. A wider distribution of scores from a sample that was recruited from a broader population may possibly increase the relationship strengths between the model's components and subsequently, the predictive power of the model.

Nonetheless, the implications of this finding would be that future research in this area would ideally conduct a pilot study using the extended TPB model in its entirety, and subsequently examine only the most predictive variables in the main study. If that process is not feasible at a practical level, then a broad recommendation based on the results would be that the original TPB model is sufficient for use in assessing education effects on intentions to use more widely known drugs like MDMA, whilst the more detailed extended model is most appropriate when assessing more obscure drugs such as GHB.

1.16 Differences in perceived credibility between harm reduction and fear-based site-type

In regard to website credibility, there appeared to be minimal differences between the harm reduction and fear-based site types, in contrast to the hypothesis that harm reduction sites would be perceived as more credible than fear-based websites. The results showed that for drug-naïve audiences, fear-based sites appeared moderately more credible than the harm reduction websites in the dimension of

goodwill ($d = 0.69, p = .003$). The inclusion criteria required all participants to have never used MDMA or GHB before, and this was reflected in their baseline results of overwhelmingly negative attitudes, norms, intentions and willingness towards MDMA or GHB use. It could thus be inferred that fear-based sites presented information that were more congruent to their original beliefs as compared to the harm reduction sites and that their perception of the presented content as well as the credibility of the website was influenced by their predisposition (Hyman & Sheatsley, 1947), i.e. that drug-naïve audiences might find fear-based websites more favourable because it presents information and/or views that are similar to their own.

However, Hong's (2006) study found that in regard to the credibility of health promotion information on the internet, intention to revisit tobacco cessation sites was not significantly linked to the dimension of goodwill but instead to its perceived depth and trust/expertise, variables that did not differ between the website types in this study. Whilst the identified difference in perceived goodwill may not impact on participants' behavioural intention directly, it may still have affected the other key outcome variables in the model.

In light of the ELM's assertion that source factors such as credibility play a more significant role when elaboration likelihood is moderate or low (Petty & Cacioppo, 1986), this suggests if the study was successful in increasing elaboration likelihood by presenting the personalised scenario (see Procedure) to participants, the differences in credibility might not be a significant factor in the efficacy of the drug education websites. On the other hand, if that attempt was not successful, and participations maintain a low or moderate level of elaboration likelihood, then the differences in perceived credibility may have had more substantial effects on behavioural intention and/or willingness, namely suggesting that participants might

have been slightly more persuaded by the fear-based websites than the harm reduction websites.

1.17 The effects of viewing drug education websites on key outcome variables

Whilst interpreting the results, it is important to bear in mind that the independent variable levels of site-type (i.e. harm reduction and fear-based) were not orthogonal because they were chosen based on the grounds of being the two most common approaches to drug education. To clarify, whilst fear-based websites have a clear agenda towards halting substance use, harm reduction websites do not promote substance use, but merely provide information about the pros and cons of substance use and suggest methods to reduce the likelihood of harm if a person does consume a drug. This lack of orthogonality between the site-type may have thus been reflected in more similarities in the results than differences.

Overall, the results suggest that exposure to the internet-based drug education materials had varying effects on key outcome variables of the extended TPB model. The most conspicuous post-treatment change was the large increases in knowledge about both drugs, which were mostly sustained after a two-week follow-up. Specifically, viewing harm reduction sites produced approximately twice the amount of increase in knowledge about MDMA ($d = +2.04$) than did the fear-based sites ($d = +0.98$), and this difference was maintained at follow-up ($d = +1.22$ vs. $d = +0.60$). For GHB, both site-types produced comparable effects on knowledge. In terms of effects on knowledge, the results suggest that the information on GHB were fairly similar across the harm reduction and fear-based websites. However, it appears that for MDMA content, harm reduction websites had more comprehensive information and/or the approach of presenting two-sided information was more effectively in increasing knowledge. It is also possible that the amount of information presented in

the websites could be a significant confounding variable in relation to knowledge gain or indeed across all variables as well, that is to say if fear-based websites provided as much information, albeit negatively laden, as harm reduction websites, that might have lead to an equal increase in knowledge about the substances.

On a similar token, the questions assessing knowledge incorporated in the current study were not balanced in terms of negative and positive aspects of the target substance, and such an approach would have provided more clarification as to the different effects of the two site-types on these items. Nonetheless, it is interesting to note that most of the knowledge items were about the negative aspects of drug use, yet participants who viewed the harm reduction website had a greater increase in knowledge for MDMA in comparison to participants in the fear-based condition. This suggests that either the greater quantity of information on the harm-reduction websites may have produced this differential knowledge gain (despite the fact that both groups had an equal amount of time to read the websites) and/or that harm reduction websites presented information in a manner that was more absorbable to participants.

Exposure to harm reduction websites did not significantly affect attitudes towards either drug. In the fear-based condition, there were also no significant changes in attitudes toward GHB, but a short-term increase in negative attitudes toward MDMA (d = -0.40) was found. This drop in attitudes toward MDMA appeared to have attenuated over the two weeks (d = -0.22). A suggestion by Hyman and Sheatsley (1947) that people interpret and distort information differently based on their prior attitudes is worth considering in light of this finding, as it implies that drug education websites are ineffective tools in changing pre-conceived attitudes toward drugs. This suggests that there should be reconsideration about measuring

attitudes as a primary, or sole, outcome variable in drug education campaigns because whilst it remains a popular measure in drug education campaigns evaluations (e.g. Orwin et al., 2006; Pennay et al., 2006), the findings suggest that attitudes may not be sensitive to the effects of this type of interventions.

Whilst it may be logical to presume that knowledge about a substance informs ones' attitudes towards it, the large increase in knowledge but lack of change in attitudes in both site-type conditions indicate that the amount and type of knowledge do not lead to significant changes in attitudes. As attitudes comprise of affective and cognitive components (Ajzen & Fishbein, 1977; Eagly & Chaiken, 1993; Petty et al., 1997), it is possible to suppose that knowledge may have very little influence over the former and only a small influence over the latter. Nonetheless, the overall implication is that whilst knowledge gain appears to be another popular measure in drug education campaign evaluations (Hughes, 2007; Snyder, 2007), it may be more valuable as an indicator of success to harm-reduction campaigns due to their goals of increasing the recipients' awareness of the different effects of substances, as well ways to reduce harm in relation to their use. On the other hand, as the findings suggest that knowledge gain does not appear to be a meaningful indicator of change in substance-related attitudes or abstinent behaviour as aspired for by fear-based campaigns, it diminishes the utility of gauging knowledge in evaluations of such campaigns.

There was a non-significant but moderate increase in behavioural intention toward ecstasy use (d = +0.25 at post-test; and d = +0.40 at follow-up) after visiting the harm reduction websites. In the fear-based condition, there was no change in behavioural intention to use MDMA after treatment but there was a non-significant but moderate decrease in intention for GHB (d = -0.37). This non-significance could

likely be explained by the heavily right-skewed baseline which was compounded by a floor effect, as the participants in the group were unanimous in their responses of not wanting to use GHB.

When participants were asked directly about what they perceived the overall impact of viewing the websites were on their intentions to use the substances, most participants reported themselves as being less likely to use both drugs. There was no significant difference between the site-type on participants' perception of behavioural intention change and their seemingly unanimous response suggests that drug education websites generally reinforce drug-naïve participants' unfavourable perceptions of substances, regardless of whether one-sided or two-sided information is provided. Whilst one-sided messages, as per fear-based websites, have been demonstrated to be more powerful than two-sided messages without refutation, as per harm reduction websites (Allen, 1991; Hale et al., 1991), the findings indicate that this is not a significant factor in affecting behavioural intention for a drug-naïve sample. Ultimately, the finding suggests that drug-naïve audiences perceive both fear-based and harm reduction drug education websites as having deterrent effects on substance use intentions. Nonetheless, it should be noted this measure was a novel item to gauge the participants' direct views of the websites' effect, but that a *perceived* decrease in behavioural intention may not necessarily render as an *actual* decrease in intention.

The effect of exposure to the websites on behavioural willingness was more complex, with varying short-term and long-term effects. There was no significant change in behavioural willingness to use GHB immediately after treatment in the harm reduction condition (d = -0.10), but a delayed effect was evident when behavioural willingness dropped significantly at follow-up (d = -0.42). There was

also a similar but non-significant trend in the fear-based condition where there was no change at post-test ($d = 0.00$), but a reduction in willingness scores occurred at follow-up ($d = -0.35$). This finding is very interesting because of its counterintuitive premise. Whilst this suggests that both types of drug education websites have delayed effects in reducing behavioural willingness toward GHB, the exact mechanism for this phenomenon remains unclear. Whilst the hierarchical regression (see Table 3) indicated that the three largest predictors of behavioural willingness in GHB use are attitudes, PBC-take and PBC-obtain, it is unlikely that attitudes would have caused this shift because attitude scores returned to baseline at follow-up instead of decreasing in tandem with behavioural willingness. This then suggests that viewing drug education websites either directly caused a delayed decrease in behavioural willingness toward GHB use, and/or that there was indirect effect from a change in either or both of the two variations of PBC (which was not assessed at follow-up due to its assumed temporal stability). This complex finding underlines the potential utility of measuring change in other components in the extended TPB model, in addition to knowledge, attitudes, behavioural intention and willingness, at all time intervals in future studies to better evaluate the dynamics of drug education.

In contrast, there were no significant effects on intention toward MDMA use in the harm reduction condition. However, exposure to the fear-based sites caused participants to significantly increase their willingness to use MDMA ($d = +0.35$) immediately after treatment, but at two-week's follow-up, the behavioural willingness returned to baseline ($d = -0.04$), possibly implying short-lived psychological reactance, i.e. that there was a shift towards the opposite direction in willingness to use MDMA because the information presented by the fear-based websites were seen as being exaggerated and manipulative (Ashton, 1999; Brown,

2001). Whilst this finding would be consistent with H3a, it was not in concordance with the other changes in the key outcome variables, which suggest that this phenomenon was not necessarily an instance of psychological reactance.

An alternative explanation for initial short-term increase in behavioural willingness would that be that prototype, which was found to be significant predictor ($\beta = 0.24$, $p = .025$) of willingness in MDMA use, might have been affected after viewing the fear-based websites, subsequently influencing behavioural willingness. If this was true, then it would mean that viewing the fear-based websites caused participants to have a more favourable impression of MDMA users, possibly due to the implicit connotation that MDMA is a very popular drug used by many youths, which then influenced them to be more willing to use MDMA for a short duration of time. However, because changes in prototype scores were not measured at post-test and follow-up, this conjecture cannot be ascertained.

The study's overall results were partially congruent with a similar experiment by Brewer (2003), where drug-naïve participants were found to have increased knowledge and less negative attitudes toward the target substances, but no change in attitudes towards future use after searching for substance-related information on the internet. Differences between the studies' designs and operationalisations of key outcome variables could account for the disparity in attitudinal change. Nonetheless, the mutual finding of knowledge increase but lack of change in behavioural intention (operationalised as "attitudes towards future use" in Brewer's study with some variation) clearly supports the notion that exposure to drug education websites have strong effects on knowledge and minimal effects on intention.

A possible reason for the lack of identifiable changes on attitude or intention was that the design did not provide sufficiently long or sufficiently frequent exposures to the information in the treatment groups. It is possible that reinforcing the message over several time intervals and/or for longer periods of time may be necessary in order to produce sustained changes. However, in a naturalistic context, exposure to websites typically requires individuals' voluntary intention to remain and return to the site, unlike public-service announcements on television or radio. This implies that generally, online-based drug education should be expected to be used for short-term information provision only, rather than a primary arm of health behavioural change.

It is possible that with the exception of behavioural willingness in MDMA use, fear-based websites did not increase attitudes, behavioural intention and behavioural willingness as hypothesised because reactance towards the websites, which would be crucial to the production of effects in the direction hypothesised, would have needed to be caused by a significant lack of credibility; for example by the fear-based site being perceived by the viewers as presenting the negative aspects of the drugs unreasonably, to the point of being discredited (Dillard & Anderson, 2004; Walton, 2006). Since both site-types were equally seen as credible (as presented in Table 4), the premise of reactance in relation to the fear-based websites and the subsequent hypotheses (i.e. H3a and H3b) were likely undermined.

Moreover, the sample's gender imbalance, where 77.2% were female, could have possibly reduced the sample's overall reactance because reactance is found to be significantly more common with men rather than women (Bensley & Wu, 1991; Bushman, 1998; Piedmont, McCrae, Riemann, & Angleitner, 2000; Ringold, 2002). Nonetheless, the results suggest that for this sample, fear-based websites were

generally seen as fair, possessing goodwill, trust, expertise and a reasonable depth of information. Subsequently, the fear appeals appeared to be effective in significantly deflating attitudes and willingness towards MDMA (Brown, 2001; Bushman, 1998), but only in the immediate short term. Nonetheless, it should be noted that the short-term increase in behavioural willingness to use MDMA – in contrast to the more negative attitude toward the drug - after viewing the fear-based websites alluded to psychological reactance, warranting scrutiny in future studies to examine the reliability of this phenomenon as well as the reason for this increase, which appeared to be dissonant to the other key outcome variables.

As a whole, the findings suggest that drug education websites are excellent sources for increasing knowledge about MDMA and GHB, but have minimal long-term effects on attitudes, behavioural intention and willingness toward their use. In addition to the increase in knowledge, the only long-term effect that was significant during follow-up was the reduction of behavioural willingness toward GHB use in the harm reduction group. It is interesting to note the effect because whilst harm reduction websites do not have a primary intention of dissuading audiences from using these substances, such as the fear-based websites, they generated similar results, and was in fact more effective in lowering willingness to use GHB

Furthermore, an ELM-based explanation for the overall results may be that in spite of using the personalised scenario in the study to increase participants' motivation and sense of personal relevance, the elaboration likelihood of the participants were generally low to moderate, thus engaging the peripheral route of processing, rendering any effect of persuasion on the part of drug education websites weak and short-lived (Petty & Cacioppo, 1986). It could be argued that in reality, if an individual chooses to visit these sites on their own volition, motivation would be

higher, and there would be stronger and more persevering changes to their attitudes, intention and/or willingness.

Nonetheless, perhaps the concept of 'persuasion' in this context only applies to the fear-based approach because it has an agenda of convincing the target audience of the benefits of abstinence; whereas the harm reduction approach has no agenda in that regard, and only seeks to inform. Indeed, if long-term effects were used as the primary yardstick of effectiveness in terms of achieving their respective agendas, then the results would indicate that both approaches 'succeeded' because those in the fear-based conditions maintained their rejection in terms of intention and willingness to use the substances, whilst those in the harm-reduction condition had large gains in the specific substance-related knowledge.

Moreover, the results also vindicate the harm-reduction approach by refuting the argument that harm reduction drug education materials condoned and promoted drug use. The results showed that after viewing the harm reduction websites, there were no significant increase in the likelihood of viewers using the drugs from baseline, and was in fact significantly reduced willingness to use GHB at follow-up, undermining the premise of using fear-based websites.

1.18 Limitations/Future studies

As highlighted in the discussion above, it would appear that one key recommendation from the current study would be to measure the other factors in the proposed model aside from knowledge, attitudes, behavioural intention and behavioural willingness, as outcome variables throughout over time, rather than simply as covariates at baseline. Whilst it was presumed that the PBC variables and normative factors like prototype and subjective norms, were stable and resistant to

the effects of viewing drug education websites, the findings suggest that they are worth examining to better understand the effects of the interventions.

The amount of information between the site-types was a potentially major confounding variable that was not possible to eliminate. Due to their fundamental characteristics in presenting one-sided information in the fear-based condition, and two-sided information in the harm reduction condition, the amount and comprehensiveness of information presented could not be equalised for the purposes of this study. Whilst the disparity in amount of information presented would be a weakness in an experimental study of the effects of persuasion (Petty & Cacioppo, 1986), it is also a natural reflection of their differences. This study attempted to minimise this potential limitation by allowing participants in both site-type conditions the same amount of time to view the websites. Nonetheless, future researchers could opt to create the websites rather than to adapt them from existing websites to control their length; or use *amount of information* as an independent variable.

The issue of credibility in this study might have been muted due to the between-subjects design in terms of site-type. Whilst using a within-subjects design for site type, where participants examined both harm reduction and fear-based sites, would have been more naturalistic, it would have confounded the interpretation of the individual impact of the site-types after intervention. Thus this exploratory study hoped to have laid the groundwork for subsequent studies by using a more limited and controlled design. It is recommended that participants be presented with both harm reduction and fear-based conditions to determine if the perceived level of credibility of the respective websites would be more strongly affected after being presented with contrasting viewpoints in future studies. Firstly, doing so would be

more realistic, as a person searching on the internet for substance-related information will typically be exposed to both harm reduction and fear-based websites. Secondly, this would probably heighten their awareness of the inherent intents and biasness of the said websites. Thus, when the contrast between the site-type becomes so blatant, the participants' rating of credibility for fear-based websites may decrease more substantially because of its apparent bias in not acknowledging any of the opposing views (Allen, 1991).

The current study recruited only drug-naïve participants for two main reasons, firstly as young drug-naïve participants are targets of the primary prevention focus of fear-based education (e.g. Paglia & Room, 1999; D. White & Pitts, 1998); and secondly to control for effects of past behaviour and habit (Gibbons, Gerrard, Blanton et al., 1998; Norman & Conner, 2006; Orbell et al., 2001; Webb & Sheeran, 2006). Whilst this assists with the interpretation of the results, future studies should to be extended to participants who have used, and/or are current users of these MDMA and/or GHB. Furthermore, a sample with a better gender balance as well as those in different age groups may display different levels of psychological reactance (Bensley & Wu, 1991; Bushman, 1998; Piedmont et al., 2000; Ringold, 2002), possibly generating different results in the key outcome variables. Extending the study by systematically studying these factors would be assist in understanding the complexities of the drug education websites' effects, as well as be crucial ingredients in the ability to generalise the efficacy of these websites to beyond a drug-naïve sample to the general community.

In terms of elaboration likelihood, this study attempted to increase motivation and personal relevance by presenting participants with a scenario where they were asked by a close friend to find more information about the drugs because the friend

was deciding whether or not to try them, in hopes of triggering the central route of persuasion. The central route was preferred over the peripheral route because only the former is likely to make any substantial and long-lasting change to attitudes or behaviours (Petty & Cacioppo, 1986). Nonetheless, the actual elaboration likelihood was not measured in the study as it was presented by the authors as a form of meta-construct that was not particularly open to measurement, but was able to be controlled by manipulating the presented scenarios to participants. Specifically, an assessment of elaboration likelihood would entail measuring participants' motivation and ability to process the presented information, which would be methodologically difficult as well as possibly tainted by demand characteristics and "good subject" tendencies (McBurney, 2001), i.e. that participants might respond in a manner to appear as being motivated and able to process the information in the study regardless of actual responses. In lieu of measuring elaboration likelihood, it might be interesting to examine how using different scenarios to manipulate varying levels of elaboration likelihood, would impact on the effectiveness of the drug education websites in future studies.

In relation to the measures used in the current study, increasing the number of comparable behavioural intention and behavioural willingness items used could possibly increase the reliability and sensitivity to change to these measures. Whilst the floor and ceilings effects in certain variables were expected from a drug-naïve sample, there were also concerns about the participants responding a socially desirable manner due to the controversial and illicit nature of the study's subject. However, the decision was made to not include the use of social desirability scales in the study as their utility have been significantly questioned (Leite & Beretvas, 2005;

Piedmont et al., 2000) and efforts were made to assure participants of their individual anonymity in responses to attain accurate responses.

1.19 Conclusion/practical implications

The implications of the results may be far reaching as a majority of young persons who use club drugs, as well those who do not, view and use the internet as an important source of information for these substances (Brewer, 2003; Falck et al., 2004).

The current study suggests that young persons who do not use substances and already have negative attitudes, norms, and low intentions and willingness to use these substances, derive almost equal benefit from both fear-based and harm reduction websites. The most apparent effect of viewing these drug education websites would be the sustained increases in knowledge about the said drugs, and also some short-term effects on attitudes, behavioural intention and willingness toward their use. Aside from the knowledge increase, the long-term effects on these key outcome variables were not evident aside from a follow-up reduction in willingness toward GHB use for participants in the harm reduction condition. This implies that overall, online-based drug education should only be expected to be used a good source for information provision rather than a primary mode of changing substance use behaviours.

In comparison with the other traditional media formats such as television or radio, where exposure to drug education materials is passive, visiting drug education related websites requires an individual to actively to visit and read it. If people generally only seek information that is congruent with their original beliefs as suggested by Hyman and Sheatsley (1947), then young persons who are current or

prospective users of such substances may be unfavourable toward fear-based websites and simply avoid such websites in the first place.

Hence, whilst fear-based websites may be useful only to non-users, harm-reduction websites may be found useful to both users and non-users. This is underscored in a survey of young persons managed for substance use problems (Boyer et al., 2005), where it was found that they primarily sought information from harm-reduction drug websites, which led 8 out of 12 of these individuals to adopt health-protective behaviours. While this supposition that participants may modify substance use behaviours to avoid harm after viewing drug education websites is beyond the scope of the current study due its drug-naïve sample, it may have potent implications for large scale substance-related health promotion efforts, namely national drug education campaigns that are disseminated to the population at large. Nonetheless, the results strongly undermine the argument that only the fear-based approach is appropriate as the means of drug education because the harm-reduction approach allegedly condones and promotes drug use. The results demonstrated there were no significant increase in the likelihood of viewers using the drugs from baseline, and was in fact significantly reduced willingness to use GHB at follow-up, viewing the harm reduction websites.

As noted, the value of the different streams of drug education is very complex and contextual. The scope of this study was intentionally limited in terms of its generalisability, due to its primary goal of establishing a pilot mechanism that is able to empirically assess the effects of drug education websites. Moreover, Webb and Sheeran's (2006) meta-analysis on behaviour change methods found that interventions that were based on the TRA/TPB produced among the largest changes in intention and behaviour, especially if the interventions promoted stability in

intention together with valence change. Whilst critical of the conceptual basis of social cognition models, Ogden's (2003) meta-analysis also found that models like the TPB were useful at a pragmatic level in developing interventions for health-related behaviours. This implies that the findings of this study might not only be useful in evaluating the impact of drug-education websites, but could be used to design interventions as well, namely using the model as a guide to target interventions on specific components that are found to have strong influences on behavioural intention and/or willingness.

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Appendix 1: Survey at Pre-test

Section A: The following questions aim to examine your knowledge about GHB and Ecstasy. Please respond TRUE or FALSE to the following statements for *both* Ecstasy and GHB. However, please respond DK (Don't Know) to any statements that you are *very* unsure about.

		Ecstasy *(circle one answer from here)*			GHB *(circle one answer from here)*		
1.	[Ecstasy/GHB] is commonly associated with reports of drink spiking.	TRUE	FALSE	DK	TRUE	FALSE	DK
2.	It is possible to be psychologically addicted to [ecstasy/GHB].	TRUE	FALSE	DK	TRUE	FALSE	DK
3.	Dehydration is a very common when you use [ecstasy/GHB]	TRUE	FALSE	DK	TRUE	FALSE	DK
4.	The most likely risk of death from [ecstasy/GHB] overdose is inhalation of vomit while unconscious.	TRUE	FALSE	DK	TRUE	FALSE	DK
5.	[Ecstasy/GHB] is a depressant.	TRUE	FALSE	DK	TRUE	FALSE	DK
6.	One of the main problems with [ecstasy/GHB] is determining its purity.	TRUE	FALSE	DK	TRUE	FALSE	DK
7.	Muscle tension is a common effect of using [ecstasy/GHB].	TRUE	FALSE	DK	TRUE	FALSE	DK
8.	[Ecstasy/GHB] has been used as appetite suppressants.	TRUE	FALSE	DK	TRUE	FALSE	DK
9.	One of the main problems with [ecstasy/GHB] is determining its dosage levels.	TRUE	FALSE	DK	TRUE	FALSE	DK
10.	The use of [ecstasy/GHB] is linked to a heightened sensory awareness.	TRUE	FALSE	DK	TRUE	FALSE	DK
11.	Unintentionally falling into a temporary comatose state is quite common with [ecstasy/GHB] use.	TRUE	FALSE	DK	TRUE	FALSE	DK
12.	People usually report only mild or no headaches the day after using [ecstasy/GHB].	TRUE	FALSE	DK	TRUE	FALSE	DK
13.	Overdose is unlikely on [ecstasy/GHB].	TRUE	FALSE	DK	TRUE	FALSE	DK
14.	[Ecstasy/GHB] can cause physical addiction.	TRUE	FALSE	DK	TRUE	FALSE	DK
15.	Users feel less socially inhibited when on [ecstasy/GHB].	TRUE	FALSE	DK	TRUE	FALSE	DK

Section B: Please evaluate how good or bad *ALL* of the following outcomes would be to you in general

	bad						good
Being sociable would be	1	2	3	4	5	6	7
Feeling depressed would be	1	2	3	4	5	6	7
Feeling lethargic would be	1	2	3	4	5	6	7
Being happy would be	1	2	3	4	5	6	7
Having paranoia would be	1	2	3	4	5	6	7
Having a brilliant night out would be	1	2	3	4	5	6	7
Being unhealthy would be	1	2	3	4	5	6	7
Being exciting would be	1	2	3	4	5	6	7
Being led on to harder drugs would be	1	2	3	4	5	6	7
Feeling run down would be	1	2	3	4	5	6	7
Feeling regret would be	1	2	3	4	5	6	7
Being in a positive mood state would be	1	2	3	4	5	6	7
Having a sense of well being would be	1	2	3	4	5	6	7
Having mood swings would be	1	2	3	4	5	6	7
Getting arrested would be	1	2	3	4	5	6	7
Having a wider network of friends would be	1	2	3	4	5	6	7

Section C: This section asks you about your responses in relation to ecstasy (MDMA). Please answer all of the following items as honestly and accurately as you can:

1. How many times do you think it is likely for you to use ecstasy over the next 2 months?

(a) Never
(b) Once
(c) Twice
(d) Three times
(e) Four times
(f) Five times
(g) More than five times

2. Considering only the positive aspects of using ecstasy in the next 2 months, and ignoring the negatives, what is your evaluation of ecstasy? *(Please rate all of the following items)*

1 not at all good	2 slightly good	3 quite good	4 extremely good
1 not at all enjoyable	2 slightly enjoyable	3 quite enjoyable	4 extremely enjoyable
1 not at all beneficial	2 slightly beneficial	3 quite beneficial	4 extremely beneficial

3. Not taking ecstasy in the next 2 months would be

1 2 3 4 5 6 7
difficult easy

4. If I wanted to get some ecstasy in the next 2 months, it would be

1 2 3 4 5 6 7
difficult easy

5. If I take ecstasy in the next 2 months, most people who are important to me would

1 2 3 4 5 6 7
disapprove approve

6. Considering only the negative aspects of using ecstasy in the next 2 months, and ignoring the positives, what is your evaluation of ecstasy? *(Please rate all of the following items)*

1 not at all negative	2 slightly negative	3 quite negative	4 extremely negative
1 not at all dangerous	2 slightly dangerous	3 quite dangerous	4 extremely dangerous
1 not at all unpleasant	2 slightly unpleasant	3 quite unpleasant	4 extremely unpleasant

7. Granted that not all people are alike, my image of the typical person who uses ecstasy is:
(Please rate all of the following items)

responsible	1	2	3	4	5	6	7	irresponsible
self-confident	1	2	3	4	5	6	7	insecure
assertive	1	2	3	4	5	6	7	unassertive
confused	1	2	3	4	5	6	7	clearheaded
popular	1	2	3	4	5	6	7	unpopular
immature	1	2	3	4	5	6	7	mature
sophisticated	1	2	3	4	5	6	7	unsophisticated

8. If a friend offered you ecstasy in the next 2 months in the following places, in which setting would you probably accept the offer? (*Tick as many or as few as apply*)

☐ Friend's home
☐ Live music event
☐ Private party
☐ Pub
☐ Raves / Nightclub / Dance parties
☐ Your home

9. For me to get hold of ecstasy in the next 2 months would be

1	2	3	4	5	6	7
difficult						easy

10. If a friend offered me ecstasy in the next 2 months and I wanted to refuse, it would be

1	2	3	4	5	6	7
difficult						easy

11. In the last six months about what proportion of your close friends have used ecstasy?

(a)	(b)	(c)	(d)	(e)	(f)	(g)
none			half			all

12. My close friends think I *should* take ecstasy

1	2	3	4	5	6	7
strongly disagree						strongly agree

13. With regard to ecstasy I want to do what my close friends think I should

1	2	3	4	5	6	7
strongly disagree						strongly agree

14. In the last six months how much ecstasy has your partner used? ***(if not currently in a relationship, please skip this question)***

(a) Never
(b) Once
(c) Twice
(d) Three times
(e) Four times
(f) Five times
(g) More than five times

15. My partner thinks I *should not* take ecstasy ***(if not currently in a relationship, please skip this question)***

1	2	3	4	5	6	7
strongly disagree						strongly agree

16. With regard to ecstasy, I want to do what my partner thinks I should ***(if not currently in a relationship, please skip this question)***

1	2	3	4	5	6	7
strongly disagree						strongly agree

17. In the last six months about what proportion of your family members/relatives have used ecstasy?

(a)	(b)	(c)	(d)	(e)	(f)	(g)
none			half			all

18. My family members/relatives think I *should* take ecstasy.

1	2	3	4	5	6	7
strongly disagree						strongly agree

19. With regard to ecstasy, I want to do what my family members/relatives think I should.

1	2	3	4	5	6	7
strongly disagree						strongly agree

20. Health experts think I *should not* take ecstasy

1	2	3	4	5	6	7
strongly disagree						strongly agree

21. With regard to ecstasy, I want to do what health experts think I should

1	2	3	4	5	6	7
strongly disagree						strongly agree

22. Considering only the positive aspects of using ecstasy in the next 2 months, and ignoring the negatives, what is your evaluation of ecstasy? ***(Please rate all of the following items)***

1	2	3	4
not all positive	slightly positive	quite positive	extremely positive
1	2	3	4
not at all safe	slightly safe	quite safe	extremely safe
1	2	3	4
not at all pleasant	slightly pleasant	quite pleasant	extremely pleasant

23. If I was in a situation where I was offered some ecstasy in the next 2 months, I would be willing to use it.

1	2	3	4	5	6	7
strongly disagree						strongly agree

24. Most people who are important to me think that...

1	2	3	4	5	6	7
I should not						I should

...use ecstasy in the next 2 months.

25. I do not plan to use ecstasy in the next 2 months

1	2	3	4	5	6	7
strongly disagree						strongly agree

26. It would be morally wrong for me to use ecstasy

1	2	3	4	5	6	7
strongly disagree						strongly agree

27. For me to decide whether I wanted to use ecstasy or not in the next 2 months is

1	2	3	4	5	6	7
difficult						easy

28. How sure are you that you could get some ecstasy in the next 2 months if you wanted to?

1	2	3	4	5	6	7
extremely unsure						extremely sure

29. Suppose you were with some friends and one of them offered you some ecstasy. How likely is it that you would do *each* of the following?

Take it and try it

1	2	3	4	5	6	7
unlikely						likely

Decline offer

1	2	3	4	5	6	7
unlikely						likely

30. Considering only the negative aspects of using ecstasy in the next 2 months, and ignoring the positives, what is your evaluation of ecstasy? *(Please rate all of the following items)*

1	2	3	4
not at all bad	slightly bad	quite bad	extremely bad
1	2	3	4
not at all unenjoyable	slightly unenjoyable	quite unenjoyable	extremely unenjoyable
1	2	3	4
not at all harmful	slightly harmful	quite harmful	extremely harmful

31. Most people who are important to me think that my taking of ecstasy in the next 2 months would be

1	2	3	4	5	6	7
undesirable						desirable

32. How often do you intend to use ecstasy over the next 2 months?

(a) Never
(b) Once
(c) Twice
(d) Three times
(e) Four times
(f) Five times
(g) More than five times

33. Please rate your preferred responses for *each* of the following statements.

Using ecstasy in the next 2 months would:

	unlikely						likely
Make me sociable	1	2	3	4	5	6	7
Make me feel depressed	1	2	3	4	5	6	7
Make me feel lethargic	1	2	3	4	5	6	7
Make me happy	1	2	3	4	5	6	7
Lead to paranoia	1	2	3	4	5	6	7
Help have a brilliant night out	1	2	3	4	5	6	7
Make me unhealthy	1	2	3	4	5	6	7
Be exciting	1	2	3	4	5	6	7
Lead on to even harder drugs	1	2	3	4	5	6	7
Make me feel run down	1	2	3	4	5	6	7
Make me feel regret	1	2	3	4	5	6	7
Lead to a positive mood state	1	2	3	4	5	6	7
Give me a sense of well being	1	2	3	4	5	6	7
Bring on mood swings	1	2	3	4	5	6	7
Get me arrested	1	2	3	4	5	6	7
Lead to a wider network of friends	1	2	3	4	5	6	7

Section D: This section asks you about your responses in relation to GHB. Please answer all of the following items as honestly and accurately as you can:

1. How many times do you think it is likely for you to use GHB over the next 2 months?

(a) Never
(b) Once
(c) Twice
(d) Three times
(e) Four times
(f) Five times
(g) More than five times

2. Considering only the positive aspects of using GHB in the next 2 months, and ignoring the negatives, what is your evaluation of GHB? *(Please rate all of the following items)*

1 not at all good	2 slightly good	3 quite good	4 extremely good
1 not at all enjoyable	2 slightly enjoyable	3 quite enjoyable	4 extremely enjoyable
1 not at all beneficial	2 slightly beneficial	3 quite beneficial	4 extremely beneficial

3. Not taking GHB in the next 2 months would be

1 2 3 4 5 6 7
difficult easy

4. If I wanted to get some GHB in the next 2 months, it would be

1 2 3 4 5 6 7
difficult easy

5. If I take GHB in the next 2 months, most people who are important to me would

1 2 3 4 5 6 7
disapprove approve

6. Considering only the negative aspects of using GHB in the next 2 months, and ignoring the positives, what is your evaluation of GHB? *(Please rate all of the following items)*

1 not at all negative	2 slightly negative	3 quite negative	4 extremely negative
1 not at all dangerous	2 slightly dangerous	3 quite dangerous	4 extremely dangerous
1 not at all unpleasant	2 slightly unpleasant	3 quite unpleasant	4 extremely unpleasant

7. Granted that not all people are alike, my image of the typical person who uses GHB is:
(Please rate <u>all</u> of the following items)

responsible	1	2	3	4	5	6	7	irresponsible
self-confident	1	2	3	4	5	6	7	insecure
assertive	1	2	3	4	5	6	7	unassertive
confused	1	2	3	4	5	6	7	clearheaded
popular	1	2	3	4	5	6	7	unpopular
immature	1	2	3	4	5	6	7	mature
sophisticated	1	2	3	4	5	6	7	unsophisticated

8. If a friend offered you GHB in the next 2 months in the following places, in which setting would you probably accept the offer? (*Tick as many or as few as apply*)

- ☐ Friend's home
- ☐ Live music event
- ☐ Private party
- ☐ Pub
- ☐ Raves / Nightclub / Dance parties
- ☐ Your home

9. For me to get hold of GHB in the next 2 months would be

1 2 3 4 5 6 7
difficult easy

10. If a friend offered me GHB in the next 2 months and I wanted to refuse, it would be

1 2 3 4 5 6 7
difficult easy

11. In the last six months about what proportion of your close friends have used GHB?

(a) (b) (c) (d) (e) (f) (g)
none half all

12. My close friends think I *<u>should</u>* take GHB

1 2 3 4 5 6 7
strongly disagree strongly agree

13. With regard to GHB I want to do what my close friends think I should

1 2 3 4 5 6 7
strongly disagree strongly agree

14. In the last six months how much GHB has your partner used? *(if not currently in a relationship, please skip this question)*

(a) Never
(b) Once
(c) Twice
(d) Three times
(e) Four times
(f) Five times
(g) More than five times

15. My partner thinks I *<u>should not</u>* take GHB *(if not currently in a relationship, please skip this question)*

1 2 3 4 5 6 7
strongly disagree strongly agree

16. With regard to GHB, I want to do what my partner thinks I should *(if not currently in a relationship, please skip this question)*

1 2 3 4 5 6 7
strongly disagree strongly agree

17. In the last six months about what proportion of your family members/relatives have used GHB?

(a) (b) (c) (d) (e) (f) (g)
none half all

18. My family members/relatives think I *<u>should</u>* take GHB.

1 2 3 4 5 6 7
strongly disagree strongly agree

19. With regard to GHB, I want to do what my family members/relatives think I should.

1	2	3	4	5	6	7
strongly disagree						strongly agree

20. Health experts think I *should not* take GHB

1	2	3	4	5	6	7
strongly disagree						strongly agree

21. With regard to GHB, I want to do what health experts think I should

1	2	3	4	5	6	7
strongly disagree						strongly agree

22. Considering only the positive aspects of using GHB in the next 2 months, and ignoring the negatives, what is your evaluation of GHB? *(Please rate all of the following items)*

1	2	3	4
not all positive	slightly positive	quite positive	extremely positive
1	2	3	4
not at all safe	slightly safe	quite safe	extremely safe
1	2	3	4
not at all pleasant	slightly pleasant	quite pleasant	extremely pleasant

23. If I was in a situation where I was offered some GHB in the next 2 months, I would be willing to use it.

1	2	3	4	5	6	7
strongly disagree						strongly agree

24. Most people who are important to me think that...

1	2	3	4	5	6	7
I should not						I should

...use GHB in the next 2 months.

25. I do not plan to use GHB in the next 2 months

1	2	3	4	5	6	7
strongly disagree						strongly agree

26. It would be morally wrong for me to use GHB

1	2	3	4	5	6	7
strongly disagree						strongly agree

27. For me to decide whether I wanted to use GHB or not in the next 2 months is

1	2	3	4	5	6	7
difficult						easy

28. How sure are you that you could get some GHB in the next 2 months if you wanted to?

1	2	3	4	5	6	7
extremely unsure						extremely sure

29. Suppose you were with some friends and one of them offered you some GHB. How likely is it that you would do *each* of the following?

Take it and try it

1	2	3	4	5	6	7
unlikely						likely

Decline offer

1	2	3	4	5	6	7
unlikely						likely

30. Considering only the negative aspects of using GHB in the next 2 months, and ignoring the positives, what is your evaluation of GHB? *(Please rate all of the following items)*

1	2	3	4
not at all bad	slightly bad	quite bad	extremely bad
1	2	3	4
not at all unenjoyable	slightly unenjoyable	quite unenjoyable	extremely unenjoyable
1	2	3	4
not at all harmful	slightly harmful	quite harmful	extremely harmful

31. Most people who are important to me think that my taking of GHB in the next 2 months would be

1	2	3	4	5	6	7
undesirable						desirable

32. How often do you intend to use GHB over the next 2 months?

(a) Never
(b) Once
(c) Twice
(d) Three times
(e) Four times
(f) Five times
(g) More than five times

33. Please rate your preferred responses for *each* of the following statements.

Using GHB in the next 2 months would:

	unlikely						likely
Make me sociable	1	2	3	4	5	6	7
Make me feel depressed	1	2	3	4	5	6	7
Make me feel lethargic	1	2	3	4	5	6	7
Make me happy	1	2	3	4	5	6	7
Lead to paranoia	1	2	3	4	5	6	7
Help have a brilliant night out	1	2	3	4	5	6	7
Make me unhealthy	1	2	3	4	5	6	7
Be exciting	1	2	3	4	5	6	7
Lead on to even harder drugs	1	2	3	4	5	6	7
Make me feel run down	1	2	3	4	5	6	7
Make me feel regret	1	2	3	4	5	6	7
Lead to a positive mood state	1	2	3	4	5	6	7
Give me a sense of well being	1	2	3	4	5	6	7
Bring on mood swings	1	2	3	4	5	6	7
Get me arrested	1	2	3	4	5	6	7
Lead to a wider network of friends	1	2	3	4	5	6	7

Appendix 2: Survey at Post-test

Section A: The following questions aim to examine your knowledge about GHB and Ecstasy. Please respond TRUE or FALSE to the following statements for *both* Ecstasy and GHB. However, please respond DK (Don't Know) to any statements that you are *very* unsure about.

		Ecstasy *(circle one answer from here)*			GHB *(circle one answer from here)*		
1.	[Ecstasy/GHB] has very similar effects to alcohol.	TRUE	FALSE	DK	TRUE	FALSE	DK
2.	Muscle tension is a common effect of using [ecstasy/GHB].	TRUE	FALSE	DK	TRUE	FALSE	DK
3.	Unintentionally falling into a temporary comatose state is quite common with [ecstasy/GHB] use.	TRUE	FALSE	DK	TRUE	FALSE	DK
4.	Overdose is unlikely on [ecstasy/GHB].	TRUE	FALSE	DK	TRUE	FALSE	DK
5.	[Ecstasy/GHB] can cause physical addiction.	TRUE	FALSE	DK	TRUE	FALSE	DK
6.	People usually report only mild or no headaches the day after using [ecstasy/GHB].	TRUE	FALSE	DK	TRUE	FALSE	DK
7.	Users feel less socially inhibited when on [ecstasy/GHB].	TRUE	FALSE	DK	TRUE	FALSE	DK
8.	There have been reports of water poisoning from drinking too much water while using [ecstasy/GHB].	TRUE	FALSE	DK	TRUE	FALSE	DK
9.	Small amounts of the [ecstasy/GHB] chemical is produced as a result of fermentation.	TRUE	FALSE	DK	TRUE	FALSE	DK
10.	[Ecstasy/GHB] is used among bodybuilders and athletes as performance enhancers.	TRUE	FALSE	DK	TRUE	FALSE	DK
11.	[Ecstasy/GHB] raises body temperature.	TRUE	FALSE	DK	TRUE	FALSE	DK
12.	Dehydration is a very common when you use [ecstasy/GHB]	TRUE	FALSE	DK	TRUE	FALSE	DK
13.	One of the main problems with [ecstasy/GHB] is determining its purity.	TRUE	FALSE	DK	TRUE	FALSE	DK
14.	One of the main problems with [ecstasy/GHB] is determining its dosage levels.	TRUE	FALSE	DK	TRUE	FALSE	DK
15.	It is possible to be psychologically addicted to [ecstasy/GHB].	TRUE	FALSE	DK	TRUE	FALSE	DK

Section B: Please evaluate how good or bad *ALL* of the following outcomes would be to you in general

	bad						good
Being sociable would be	1	2	3	4	5	6	7
Feeling depressed would be	1	2	3	4	5	6	7
Feeling lethargic would be	1	2	3	4	5	6	7
Being happy would be	1	2	3	4	5	6	7
Having paranoia would be	1	2	3	4	5	6	7
Having a brilliant night out would be	1	2	3	4	5	6	7
Being unhealthy would be	1	2	3	4	5	6	7
Being exciting would be	1	2	3	4	5	6	7
Being led on to harder drugs would be	1	2	3	4	5	6	7
Feeling run down would be	1	2	3	4	5	6	7
Feeling regret would be	1	2	3	4	5	6	7
Being in a positive mood state would be	1	2	3	4	5	6	7
Having a sense of well being would be	1	2	3	4	5	6	7
Having mood swings would be	1	2	3	4	5	6	7
Getting arrested would be	1	2	3	4	5	6	7
Having a wider network of friends would be	1	2	3	4	5	6	7

Section C: This section asks you about your responses in relation to ecstasy (MDMA). Please answer all of the following items as honestly and accurately as you can:

1. Considering only the positive aspects of using ecstasy in the next 2 months, and ignoring the negatives, what is your evaluation of ecstasy? ***(Please rate all of the following items)***

1 not at all good	2 slightly good	3 quite good	4 extremely good
1 not at all enjoyable	2 slightly enjoyable	3 quite enjoyable	4 extremely enjoyable
1 not at all beneficial	2 slightly beneficial	3 quite beneficial	4 extremely beneficial

2. After discussing the information about ecstasy from the websites with your good friend, s/he decides to try one. Your good friend says that s/he would really like you to try it with him/her.

Try it with your good friend?

Yes / No *(Please circle your response)*

How difficult was it for you to make that decision?

1	2	3	4	5	6	7
difficult						easy

3. Considering only the negative aspects of using ecstasy in the next 2 months, and ignoring the positives, what is your evaluation of ecstasy? ***(Please rate all of the following items)***

1 not at all negative	2 slightly negative	3 quite negative	4 extremely negative
1 not at all dangerous	2 slightly dangerous	3 quite dangerous	4 extremely dangerous
1 not at all unpleasant	2 slightly unpleasant	3 quite unpleasant	4 extremely unpleasant

4. In which of the following settings would you intend to use ecstasy in the next 2 months? (*Tick as many or as few as apply*)

- ☐ Friend's home
- ☐ Live music event
- ☐ Private party
- ☐ Pub
- ☐ Raves / Nightclub / Dance parties
- ☐ Your home

5. If a friend offered you ecstasy in the next 2 months in the following places, in which setting would you probably accept the offer? (*Tick as many or as few as apply*)

- ☐ Friend's home
- ☐ Live music event
- ☐ Private party
- ☐ Pub
- ☐ Raves / Nightclub / Dance parties
- ☐ Your home

6. Considering only the negative aspects of using ecstasy in the next 2 months, and ignoring the positives, what is your evaluation of ecstasy? ***(Please rate all of the following items)***

1 not at all bad	2 slightly bad	3 quite bad	4 extremely bad
1 not at all unenjoyable	2 slightly unenjoyable	3 quite unenjoyable	4 extremely unenjoyable
1 not at all harmful	2 slightly harmful	3 quite harmful	4 extremely harmful

7. I do <u>not</u> want to use ecstasy in the next 2 months

1	2	3	4	5	6	7
strongly disagree						strongly agree

8. Considering <u>only</u> the positive aspects of using ecstasy in the next 2 months, and ignoring the negatives, what is your evaluation of ecstasy? *(Please rate <u>all</u> of the following items)*

1 not all positive	2 slightly positive	3 quite positive	4 extremely positive
1 not at all safe	2 slightly safe	3 quite safe	4 extremely safe
1 not at all pleasant	2 slightly pleasant	3 quite pleasant	4 extremely pleasant

9. After reviewing the information from the websites, how has your intention to use ecstasy in the next 2 months changed?

1	2	3	4	5	6	7
More unlikely to use			No change			More likely to use

10. Please rate your preferred responses for <u>*each*</u> of the following statements.

Using ecstasy in the next 2 months would:

	unlikely						likely
Make me sociable	1	2	3	4	5	6	7
Make me feel depressed	1	2	3	4	5	6	7
Make me feel lethargic	1	2	3	4	5	6	7
Make me happy	1	2	3	4	5	6	7
Lead to paranoia	1	2	3	4	5	6	7
Help have a brilliant night out	1	2	3	4	5	6	7
Make me unhealthy	1	2	3	4	5	6	7
Be exciting	1	2	3	4	5	6	7
Lead on to even harder drugs	1	2	3	4	5	6	7
Make me feel run down	1	2	3	4	5	6	7
Make me feel regret	1	2	3	4	5	6	7
Lead to a positive mood state	1	2	3	4	5	6	7
Give me a sense of well being	1	2	3	4	5	6	7
Bring on mood swings	1	2	3	4	5	6	7
Get me arrested	1	2	3	4	5	6	7
Lead to a wider network of friends	1	2	3	4	5	6	7

<u>Section D: This section asks you about your responses in relation to GHB. Please answer all of the following items as honestly and accurately as you can:</u>

1. Considering <u>only</u> the positive aspects of using GHB in the next 2 months, and ignoring the negatives, what is your evaluation of GHB? *(Please rate <u>all</u> of the following items)*

1 not at all good	2 slightly good	3 quite good	4 extremely good
1 not at all enjoyable	2 slightly enjoyable	3 quite enjoyable	4 extremely enjoyable
1 not at all beneficial	2 slightly beneficial	3 quite beneficial	4 extremely beneficial

2. After discussing the information about GHB from the websites with your good friend, s/he decides to try one. Your good friend says that s/he would really like you to try it with him/her.

Try it with your good friend?

Yes / No *(Please circle your response)*

How difficult was it for you to make that decision?

1	2	3	4	5	6	7
difficult						easy

3. Considering only the negative aspects of using GHB in the next 2 months, and ignoring the positives, what is your evaluation of GHB? *(Please rate all of the following items)*

1 not at all negative	2 slightly negative	3 quite negative	4 extremely negative
1 not at all dangerous	2 slightly dangerous	3 quite dangerous	4 extremely dangerous
1 not at all unpleasant	2 slightly unpleasant	3 quite unpleasant	4 extremely unpleasant

4. In which of the following settings would you intend to use GHB in the next 2 months? (*Tick as many or as few as apply*)

☐	Friend's home	☐	Pub
☐	Live music event	☐	Raves / Nightclub / Dance parties
☐	Private party	☐	Your home

5. If a friend offered you GHB in the next 2 months in the following places, in which setting would you probably accept the offer? (*Tick as many or as few as apply*)

☐	Friend's home	☐	Pub
☐	Live music event	☐	Raves / Nightclub / Dance parties
☐	Private party	☐	Your home

6. Considering only the negative aspects of using GHB in the next 2 months, and ignoring the positives, what is your evaluation of GHB? *(Please rate all of the following items)*

1 not at all bad	2 slightly bad	3 quite bad	4 extremely bad
1 not at all unenjoyable	2 slightly unenjoyable	3 quite unenjoyable	4 extremely unenjoyable
1 not at all harmful	2 slightly harmful	3 quite harmful	4 extremely harmful

7. I do not want to use GHB in the next 2 months

1	2	3	4	5	6	7
strongly disagree						strongly agree

8. Considering only the positive aspects of using GHB in the next 2 months, and ignoring the negatives, what is your evaluation of GHB? *(Please rate all of the following items)*

1 not all positive	2 slightly positive	3 quite positive	4 extremely positive
1 not at all safe	2 slightly safe	3 quite safe	4 extremely safe
1 not at all pleasant	2 slightly pleasant	3 quite pleasant	4 extremely pleasant

9. After reviewing the information from the websites, how has your intention to use GHB in the next 2 months changed?

1	2	3	4	5	6	7
More unlikely to use			No change			More likely to use

10. Please rate your preferred responses for *each* of the following statements.

Using GHB in the next 2 months would:

	unlikely						likely
Make me sociable	1	2	3	4	5	6	7
Make me feel depressed	1	2	3	4	5	6	7
Make me feel lethargic	1	2	3	4	5	6	7
Make me happy	1	2	3	4	5	6	7
Lead to paranoia	1	2	3	4	5	6	7
Help have a brilliant night out	1	2	3	4	5	6	7
Make me unhealthy	1	2	3	4	5	6	7
Be exciting	1	2	3	4	5	6	7
Lead on to even harder drugs	1	2	3	4	5	6	7
Make me feel run down	1	2	3	4	5	6	7
Make me feel regret	1	2	3	4	5	6	7
Lead to a positive mood state	1	2	3	4	5	6	7
Give me a sense of well being	1	2	3	4	5	6	7
Bring on mood swings	1	2	3	4	5	6	7
Get me arrested	1	2	3	4	5	6	7
Lead to a wider network of friends	1	2	3	4	5	6	7

Section E: Please read and consider this following scenario as realistically and honestly as you can. After that, please respond to ALL the items below.

1. "You just had a birthday party and your friends decided to pull a prank on you and buy you some weird presents. The presents include a box of vibrating condoms, a glow-in-the-dark thong as well as some real ecstasy pills and GHB vials."

Would you try at least one of the ecstasy pills in the next 2 months?
Yes / No *(Please circle your response)*

How difficult was it for you to make that decision?

1	2	3	4	5	6	7
difficult						easy

Would you try at least one of the GHB vials in the next 2 months?
Yes / No *(Please circle your response)*

How difficult was it for you to make that decision?

1	2	3	4	5	6	7
difficult						easy

2. Knowing what you know now after reading the websites about ecstasy and GHB, what are your intentions towards them?

Would you try ecstasy in the next 2 months?

1	2	3	4	5	6	7
definitely not						definitely yes

Would you try GHB in the next 2 months?

1	2	3	4	5	6	7
definitely not						definitely yes

Section F: Please respond to the following statements in regard to the group of websites you have visited today (as a WHOLE).

1. The sites provide information that is neutral.

1 2 3 4 5 6 7
strongly disagree strongly agree

2. The sites do not provide in-depth information.

1 2 3 4 5 6 7
strongly disagree strongly agree

3. The sites have my interests at heart.

1 2 3 4 5 6 7
strongly disagree strongly agree

4. The sites appear to have experts on the topic discussed.

1 2 3 4 5 6 7
strongly disagree strongly agree

5. The sites provide information that is not balanced.

1 2 3 4 5 6 7
strongly disagree strongly agree

6. The sites are not comprehensive.

1 2 3 4 5 6 7
strongly disagree strongly agree

7. The sites are uncaring about their visitors.

1 2 3 4 5 6 7
strongly disagree strongly agree

8. The sites are ethical.

1 2 3 4 5 6 7
strongly disagree strongly agree

9. The sites are biased in the information it provides.

1 2 3 4 5 6 7
strongly disagree strongly agree

10. The sites offer everything you need to know on a topic.

1 2 3 4 5 6 7
strongly disagree strongly agree

11. The sites are not concerned about their visitors.

1 2 3 4 5 6 7
strongly disagree strongly agree

12. The sites appears to be a leader in their area of specialty.

1 2 3 4 5 6 7
strongly disagree strongly agree

Appendix 3: Survey at Follow-up

Section A: The following questions aim to examine your knowledge about GHB and Ecstasy. Please respond TRUE or FALSE to the following statements for *both* Ecstasy and GHB. However, please respond DK (Don't Know) to any statements that you are *very* unsure about.

		Ecstasy *(circle one answer from here)*			GHB *(circle one answer from here)*		
1.	[Ecstasy/GHB] has been used to treat insomnia.	TRUE	FALSE	DK	TRUE	FALSE	DK
2.	It is possible to be psychologically addicted to [ecstasy/GHB].	TRUE	FALSE	DK	TRUE	FALSE	DK
3.	Overdose is unlikely on [ecstasy/GHB].	TRUE	FALSE	DK	TRUE	FALSE	DK
4.	When sold in powder form, [ecstasy/GHB] is usually dissolved before consumed.	TRUE	FALSE	DK	TRUE	FALSE	DK
5.	The scientific evidence on neurotoxicity from [ecstasy/GHB] use is controversial at this time.	TRUE	FALSE	DK	TRUE	FALSE	DK
6.	One of the main problems with [ecstasy/GHB] is determining its purity.	TRUE	FALSE	DK	TRUE	FALSE	DK
7.	Unintentionally falling into a temporary comatose state is quite common with [ecstasy/GHB] use.	TRUE	FALSE	DK	TRUE	FALSE	DK
8.	Muscle tension is a common effect of using [ecstasy/GHB].	TRUE	FALSE	DK	TRUE	FALSE	DK
9.	[Ecstasy/GHB]is usually sold in liquid form.	TRUE	FALSE	DK	TRUE	FALSE	DK
10.	One of the main problems with [ecstasy/GHB] is determining its dosage levels.	TRUE	FALSE	DK	TRUE	FALSE	DK
11.	Users feel less socially inhibited when on [ecstasy/GHB].	TRUE	FALSE	DK	TRUE	FALSE	DK
12.	The most likely risk of death from [ecstasy/GHB] is overheating.	TRUE	FALSE	DK	TRUE	FALSE	DK
13.	Dehydration is a very common when you use [ecstasy/GHB]	TRUE	FALSE	DK	TRUE	FALSE	DK
14.	[Ecstasy/GHB] can cause physical addiction.	TRUE	FALSE	DK	TRUE	FALSE	DK
15.	People usually report only mild or no headaches the day after using [ecstasy/GHB].	TRUE	FALSE	DK	TRUE	FALSE	DK

Section B: Please evaluate how good or bad *ALL* of the following outcomes would be to you in general

	bad						good
Being sociable would be	1	2	3	4	5	6	7
Feeling depressed would be	1	2	3	4	5	6	7
Feeling lethargic would be	1	2	3	4	5	6	7
Being happy would be	1	2	3	4	5	6	7
Having paranoia would be	1	2	3	4	5	6	7
Having a brilliant night out would be	1	2	3	4	5	6	7
Being unhealthy would be	1	2	3	4	5	6	7
Being exciting would be	1	2	3	4	5	6	7
Being led on to harder drugs would be	1	2	3	4	5	6	7
Feeling run down would be	1	2	3	4	5	6	7
Feeling regret would be	1	2	3	4	5	6	7
Being in a positive mood state would be	1	2	3	4	5	6	7
Having a sense of well being would be	1	2	3	4	5	6	7
Having mood swings would be	1	2	3	4	5	6	7
Getting arrested would be	1	2	3	4	5	6	7
Having a wider network of friends would be	1	2	3	4	5	6	7

Section C: This section asks you about your responses in relation to ecstasy (MDMA). Please answer all of the following items as honestly and accurately as you can:

1. Considering only the positive aspects of using ecstasy in the next 2 months, and ignoring the negatives, what is your evaluation of ecstasy? *(Please rate all of the following items)*

1	2	3	4
not all positive	slightly positive	quite positive	extremely positive
1	2	3	4
not at all safe	slightly safe	quite safe	extremely safe
1	2	3	4
not at all pleasant	slightly pleasant	quite pleasant	extremely pleasant

2. I do not intend to use ecstasy in the next 2 months

1	2	3	4	5	6	7
strongly disagree						strongly agree

3. Considering only the negative aspects of using ecstasy in the next 2 months, and ignoring the positives, what is your evaluation of ecstasy? *(Please rate all of the following items)*

1	2	3	4
not at all bad	slightly bad	quite bad	extremely bad
1	2	3	4
not at all unenjoyable	slightly unenjoyable	quite unenjoyable	extremely unenjoyable
1	2	3	4
not at all harmful	slightly harmful	quite harmful	extremely harmful

4. If I was in a situation where I was offered some ecstasy in the next 2 months, I would not be willing to use it.

1	2	3	4	5	6	7
strongly disagree						strongly agree

5. Considering only the negative aspects of using ecstasy in the next 2 months, and ignoring the positives, what is your evaluation of ecstasy? *(Please rate all of the following items)*

1	2	3	4
not at all negative	slightly negative	quite negative	extremely negative
1	2	3	4
not at all dangerous	slightly dangerous	quite dangerous	extremely dangerous
1	2	3	4
not at all unpleasant	slightly unpleasant	quite unpleasant	extremely unpleasant

6. How many times do you think it is likely for you to use ecstasy over the next 2 months?

(a) Never
(b) Once
(c) Twice
(d) Three times
(e) Four times
(f) Five times
(g) More than five times

7. Considering only the positive aspects of using ecstasy in the next 2 months, and ignoring the negatives, what is your evaluation of ecstasy? *(Please rate all of the following items)*

1	2	3	4
not at all good	slightly good	quite good	extremely good
1	2	3	4
not at all enjoyable	slightly enjoyable	quite enjoyable	extremely enjoyable
1	2	3	4
not at all beneficial	slightly beneficial	quite beneficial	extremely beneficial

8. **Your good friend who wanted to try ecstasy, purchased some with you in mind and left them with you for you to decide to take it or not.**

Use at least one?

Yes / No *(Please circle your response)*

How difficult was it for you to make that decision?

1	2	3	4	5	6	7
difficult						easy

9. **I want to use ecstasy in the next 2 months**

1	2	3	4	5	6	7
strongly disagree						strongly agree

10. **Please rate your preferred responses for *<u>each</u>* of the following statements.**

Using ecstasy in the next 2 months would:

	unlikely						likely
Make me sociable	1	2	3	4	5	6	7
Make me feel depressed	1	2	3	4	5	6	7
Make me feel lethargic	1	2	3	4	5	6	7
Make me happy	1	2	3	4	5	6	7
Lead to paranoia	1	2	3	4	5	6	7
Help have a brilliant night out	1	2	3	4	5	6	7
Make me unhealthy	1	2	3	4	5	6	7
Be exciting	1	2	3	4	5	6	7
Lead on to even harder drugs	1	2	3	4	5	6	7
Make me feel run down	1	2	3	4	5	6	7
Make me feel regret	1	2	3	4	5	6	7
Lead to a positive mood state	1	2	3	4	5	6	7
Give me a sense of well being	1	2	3	4	5	6	7
Bring on mood swings	1	2	3	4	5	6	7
Get me arrested	1	2	3	4	5	6	7
Lead to a wider network of friends	1	2	3	4	5	6	7

<u>Section D: This section asks you about your responses in relation to GHB. Please answer all of the following items as honestly and accurately as you can:</u>

1. **Considering only the positive aspects of using GHB in the next 2 months, and ignoring the negatives, what is your evaluation of GHB? *(Please rate <u>all</u> of the following items)***

1 not all positive	2 slightly positive	3 quite positive	4 extremely positive
1 not at all safe	2 slightly safe	3 quite safe	4 extremely safe
1 not at all pleasant	2 slightly pleasant	3 quite pleasant	4 extremely pleasant

2. **I do <u>not</u> intend to use GHB in the next 2 months**

1	2	3	4	5	6	7
strongly disagree						strongly agree

3. Considering only the negative aspects of using GHB in the next 2 months, and ignoring the positives, what is your evaluation of GHB? *(Please rate all of the following items)*

1	2	3	4
not at all bad	slightly bad	quite bad	extremely bad
1	2	3	4
not at all unenjoyable	slightly unenjoyable	quite unenjoyable	extremely unenjoyable
1	2	3	4
not at all harmful	slightly harmful	quite harmful	extremely harmful

4. If I was in a situation where I was offered some GHB in the next 2 months, I would not be willing to use it.

1	2	3	4	5	6	7
strongly disagree						strongly agree

5. Considering only the negative aspects of using GHB in the next 2 months, and ignoring the positives, what is your evaluation of GHB? *(Please rate all of the following items)*

1	2	3	4
not at all negative	slightly negative	quite negative	extremely negative
1	2	3	4
not at all dangerous	slightly dangerous	quite dangerous	extremely dangerous
1	2	3	4
not at all unpleasant	slightly unpleasant	quite unpleasant	extremely unpleasant

6. How many times do you think it is likely for you to use GHB over the next 2 months?

(a) Never
(b) Once
(c) Twice
(d) Three times
(e) Four times
(f) Five times
(g) More than five times

7. Considering only the positive aspects of using GHB in the next 2 months, and ignoring the negatives, what is your evaluation of GHB? *(Please rate all of the following items)*

1	2	3	4
not at all good	slightly good	quite good	extremely good
1	2	3	4
not at all enjoyable	slightly enjoyable	quite enjoyable	extremely enjoyable
1	2	3	4
not at all beneficial	slightly beneficial	quite beneficial	extremely beneficial

8. Your good friend who wanted to try GHB, purchased some with you in mind and left them with you for you to decide to take it or not.

Use at least one?

Yes / No *(Please circle your response)*

How difficult was it for you to make that decision?

1	2	3	4	5	6	7
difficult						easy

9. I want to use GHB in the next 2 months

1	2	3	4	5	6	7
strongly disagree						strongly agree

10. Please rate your preferred responses for *each* of the following statements.

Using GHB in the next 2 months would:

	unlikely						likely
Make me sociable	1	2	3	4	5	6	7
Make me feel depressed	1	2	3	4	5	6	7
Make me feel lethargic	1	2	3	4	5	6	7
Make me happy	1	2	3	4	5	6	7
Lead to paranoia	1	2	3	4	5	6	7
Help have a brilliant night out	1	2	3	4	5	6	7
Make me unhealthy	1	2	3	4	5	6	7
Be exciting	1	2	3	4	5	6	7
Lead on to even harder drugs	1	2	3	4	5	6	7
Make me feel run down	1	2	3	4	5	6	7
Make me feel regret	1	2	3	4	5	6	7
Lead to a positive mood state	1	2	3	4	5	6	7
Give me a sense of well being	1	2	3	4	5	6	7
Bring on mood swings	1	2	3	4	5	6	7
Get me arrested	1	2	3	4	5	6	7
Lead to a wider network of friends	1	2	3	4	5	6	7

Section E: Please read and consider this following scenario as realistically and honestly as you can. After that, please respond to ALL the items below.

"Suppose you were with a group of friends at a party and some of them were using ecstasy and GHB. There are some extra ecstasy tablets and GHB vials that you could have if you wanted."

Would you try at least one of the ecstasy pills?

Yes / No *(Please circle your response)*

How difficult was it for you to make that decision?

1	2	3	4	5	6	7
difficult						easy

Would you try at least one of the GHB vials?

Yes / No *(Please circle your response)*

How difficult was it for you to make that decision?

1	2	3	4	5	6	7
difficult						easy

Appendix 4: Website Extracts

Harm Reduction Condition

a) Club Drugs 1 (excerpted from www.ravesafe.org; last updated April 17th 2007)

- Extracts of MDMA-related information:-

"...Leah Betts, the teenager who collapsed after taking an Ecstasy tablet in England, died as a result of drinking too much water, which made her brain swell....

Overheating and dehydration are known risks of taking Ecstasy, a stimulant which can keep young people dancing for hours, and drug agencies advise users to drink plenty of water and take frequent rests.

Although she had not been dancing energetically for hours, it is understood that when Leah began to feel unwell at the party she made repeated trips to the bathroom to drink water. She believed mistakenly that this was the way to ward off the ill-effects of the drug...

Dr Berridge said the advice from drug agencies to young people to drink plain water could have fatal consequences, as in Leah's case. They should drink water or soft drinks with salt added at the rate of two teaspoons per litre or isotonic sports drinks. If taken in excessive amounts these could lead to swelling in the body tissues but would not cause swelling of the brain because the salt would maintain plasma sodium levels..."

- Extracts of GHB-related information:-

"...Whilst GHB's most noticeable effect is euphoria, it can also be a downer. A small dose - half a capful - of GHB will make you fell relaxed and uninhibited, kind of tipsy. More can cause sedation, and will slow you down until you fall asleep. No hallucinations or visual effects occur and GHB makes you extroverted rather than introspective. With larger doses, noticeable effects include verbal diarrhoea, slurring of speech, drowsiness, nausea, incoherence, difficulty focussing and regrettable behaviour. The effects of GHB may become apparent after about 5-15 minutes, and come up strongly after 20-30 minutes. The effects can last for up to 2 - 4 hours.

One of the biggest dangers of using GHB is the difficulty of determining a safe dosage. It all depends on the body weight, general state of health and mind at time of use and also the concentration of the liquid. Taking too much GHB can lead to amnesia, respiratory difficulties and loss of consciousness. If someone passes out on GHB put them in the recovery position and let them sleep it off. Check their vital signs regularly to see if they are OK. They will awake a few hours later with no recall of their sleep. Other side-effects are abnormal muscle movements, and occasional emergence delirium..."

b) Club Drugs 2 (excerpted from www.torontovibe.com; last updated April 17th 2007)

- Extracts of MDMA-related information:-

"...Ecstasy can lead to emotional openness, euphoria, an intense, energetic, spiritual high; and can connect people freely and openly with each other, promote deep inner thinking and analysis, or lead to a reduction in cynical or critical thoughts...

Ecstasy pills (E) can contain a wide variety of substances. Some pills contain MDMA, others contain MDMA mixed with other drugs, and some contain other drugs but no MDMA at all. Chemical analysis has found ingredients including: PMA; DXM; PCP; ketamine; caffeine; ephedrine; methamphetamine...

The buzz is dependent on many factors, including the ingredients of the pill. Other factors include how you are feeling before you take the pill, how much food is in your stomach and what environment you are taking the drug in.

When swallowed, the effects can come on within 20 minutes, or may take as long as 90 minutes. Pills generally act like stimulants, increasing body temperature, blood pressure and heart rate. Some pills produce greater feelings of happiness and contentment (feeling "loved up") while others produce a more energetic "wired" body buzz. The "loved up" feeling is usually with pills that have a greater MDMA content, while the more energetic pills probably contain more amphetamine like ingredients..."

- Extracts of GHB-related information:-

"...GHB can create feelings of inner peace, happiness, pleasure touching, and relaxation. Some people enjoy having sex while high because of possible heightened sense of touch, disinhibition, enhanced erection, and an increased intensity of orgasm...

Passing out: It is easy to become unconscious when using 'G'. There can be a small difference between a dose that can give you a good high and a dose that can cause sudden loss of consciousness or sedation. Being passed out puts you at risk of sexual assault, and if you vomit - death (you choke on your vomit)...

GHB is typically sold by the vial as a clear liquid with a consistency slightly thicker than water...

Initial feelings of relaxation and a reduction in anxiety that lead can make the user more sociable..."

c) Club Drugs 3 (excerpted from www.buzzcode.org; last updated April 17th 2007)

- Extracts of MDMA-related information:-

"...MDMA works primarily on the neurotransmitter serotonin. Serotonin (5-hydroxytrtamine, 5-HT) is one of the major neurotransmitters in the brain. It is synthesized in serotonin neurons and stored in synaptic vesicles (parts of a brain cell that store neurotransmitters). As our brain goes about its normal routine, these vesicles release serotonin into the synaptic cleft (the space between brain cells), as a means of communicating with other brain cells. An important aspect of this communication process is "serotonin re-uptake". Once serotonin is released from one cell and enters the synaptic cleft, it is then taken back into the serotonin neuron and stored in vesicles or it is metabolized (broken down) by the body-primarily by the enzyme monoamine oxidase (MAO). Serotonin is responsible for many psychological and physiological states including mood and sleep. It has been particularly associated with major depression and obsessive-compulsive disorders. With the normal transmission, re-uptake, and metabolism of neurotransmitters, we experience both a stable psychological experience and stable physical experience...

Depending on how much and how recently one has eaten, MDMA generally takes 30-60 minutes (although sometimes as long as 2 hours) to take effect. The duration of the drug's effects is usually three to five hours, depending on what you've eaten and the amount you've ingested. For many people there is an additional period of time (2-6 hours) where it is difficult to go to sleep and there is definitely a noticeable difference from everyday reality, but which is not strong enough to be considered 'tripping'. Some users report feeling buzzed or sketched out-but not high-up to 24 hours later..."

- Extracts of GHB-related information:-

"...GHB usually comes as an odourless liquid with a salty or bitter taste. More often than not, it comes in small bottles or vials. There is some claim that that GHB comes in powder and capsule form. Most people consume it by mixing it with a beverage like water, pop, or juice. We have no idea what a recreational dose is and would not dream of making any recommendation as to what an appropriate dose looks like. Given the high dose-response curve, the idiosyncrasies of your body's metabolism (including what you just ate), and the problem with not knowing the concentration of the drug you have in your hand, a "recreational dose" is likely to change constantly. Just because it's sold in vials doesn't mean that a vial is a dose. In fact, taking the contents of an entire vial is probably something you should consider not doing...

GHB is naturally found in the human body in minute quantities. It is a minor inhibitory neurotransmitter that acts along with one of the major inhibitory neurotransmitters gamma-aminobutyric acid (GABA) to slow down the transmission of dopamine mediated signals in certain areas of the brain (Li, Stokes, Woeckener 1998, Tunniclif 1997). In practical terms, this means that your brain slows down in its functioning if you are taking GHB. What this means is that GHB is a nervous system depressant, like alcohol. The effects of GHB at recreational doses are similar to alcohol. At lower doses, its effects are similar to mild alcohol intoxication causing decreased motor skills, relaxation, reduction of social inhibitions and mood lift. By all the accounts we've heard, GHB seems to heighten feelings of sexuality. Users commonly claim that the drug makes them feel sexually more aggressive..."

Fear-based Condition

a) Party Drugs 1 (excerpted from www.theantidrug.org; last updated April 17th 2007)

- Extracts of MDMA-related information:-

"...MDMA, called "Adam," "ecstasy," or "XTC" on the street, is a synthetic, psychoactive (mind-altering) drug with hallucinogenic and amphetamine-like properties. Its chemical structure is similar to two other synthetic drugs, MDA and methamphetamine, which are known to cause brain damage...

Psychological difficulties, including confusion, depression, sleep problems, drug craving, severe anxiety, and paranoia during and sometimes weeks after taking MDMA (in some cases, psychotic episodes have been reported)...

Long-term effects. Recent research findings also link MDMA use to long-term damage to those parts of the brain critical to thought and memory. It is believed that the drug causes damage to the neurons that use the chemical serotonin to communicate with other neurons..."

- Extracts of GHB-related information:-

"...Gamma-hydroxybutyric acid or GHB, is a compound that was initially used by body builders to stimulate muscle growth. In recent years it has become popular as a recreational drug among club kids and partygoers.

This "designer" drug is often used in combination with other drugs, such as Ecstasy. GHB is synthesized from a chemical used to clean electrical circuit boards, and is available in clear liquid, white powder, tablet and capsule form...

GHB users risk many negative physical effects including vomiting, liver failure, potentially fatal respiratory problems, and tremors and seizures, which can result in comas...

GHB has reportedly been used in cases of date rape. Because GHB is odorless and tasteless, it can be slipped into someone's drink without detection..."

b) Party Drugs 2 (excerpted from www.drugs.health.gov.au; last updated April 17th 2007)

- Extracts of MDMA-related information:-

"...The symptoms of using ecstasy can include:
- *Increased blood pressure and pulse rate*
- *Raised body temperature*
- *Sweating*
- *Overheating*
- *Jaw clenching...*

Consequences of using ecstasy can include:
- *Chronic sleep problems*
- *Cracked teeth through grinding*
- *High blood pressure*
- *Dehydration*
- *Anxiety...*

Ecstasy is the street term for a number of substances that are similar to the chemical methylenedioxymethamphetamine (MDMA), a stimulant with hallucinogenic properties. Like any illegal drug, there's no 'quality control' during the manufacturing of ecstasy, and so you can never be sure what you are actually taking. While the active ingredient of ecstasy is MDMA most pills do not contain any MDMA and are more likely to be made up of methamphetamine (speed) combined with a synthetic hallucinogen..."

- Extracts of GHB-related information:-

"...The symptoms of using GHB can include:
- *Drowsiness*
- *Induced sleep*
- *Nausea*
- *Reduced inhibitions...*

Consequences of using GHB can include:

- *Extreme drowsiness/grogginess*
- *Hallucinations*
- *Difficulty focussing eyes*
- *Vomiting...*

Gamma-hydroxybutyrate (GHB) is a depressant drug that contains sedative and, at sufficient doses, anesthetic properties (that means it knocks you out). Depressant drugs slow brain and central nervous system activity.

GHB has been identified as a 'date-rape drug' because it leaves users with amnesia, impaired movement and speech. It can be easily camouflaged in drinks as it is difficult to taste..."

c) Party Drugs 3 (excerpted from www.drugstory.org; last updated April 17th 2007)

- Extracts of MDMA-related information:-

"...Some people believe Ecstasy is a miracle drug. Users claim to experience unparalleled highs without the immediate hangovers and "crashing" that are associated with alcohol and illicit drugs. However, there are serious side effects associated with Ecstasy use. Past studies find that the drug seriously impairs the brain's serotonin system, which is involved with thought, memory, mood regulation and feelings of pleasure. Researchers have also recently discovered that the amount of brain damage is related to the total amount of Ecstasy users have taken, suggesting a direct link between drug use and decreased brain function...

Ecstasy is a lucrative business. Relatively cheap to make overseas, it can be sold for a substantial profit in the United States. Just one Ecstasy pill costs 15 to 25 cents to make in Europe but can be sold in the United States for $20 to $50. As a result, officials have seen an astronomical increase in Ecstasy trafficking. According to USA Today, in 2000, the DEA and other agencies confiscated more than 11 million pills, up from a few hundred thousand in 1995. International crime groups have also become involved in the Ecstasy market, causing violent turf wars among dealers with young, low-level dealers caught in the cross-fire...

Although the name gives the drug a strange allure and piques the interest of young people looking for a good time, Ecstasy is a dangerous drug that has proven to cause short- and long-term damage to the mind and body. Accurate information regarding Ecstasy must be available to counter rumors and media sensationalism that often understate Ecstasy's harmful effects and to keep others from experimenting with the drug. Experts also say to watch out for other illegal substances that are popular in the club culture, such as Ketamine, GHB and Rohypnol, as they become more mainstream in Ecstasy's wake and recreational use begins to rise."

- Extracts of GHB-related information:-

"...Banned in 1990 by the Federal Drug Administration (FDA), Gamma hydroxybutyrate is a central nervous system depressant that was widely used for its alleged anabolic steroid effects and is still abused by individuals interested in gaining muscle mass easily and quickly. However, GHB's high profile association with date-rape incidences caused former President Clinton to sign the Hillory J. Farias and Samantha Reid Date-Rape Prohibition Act of 2000, which labeled the drug as a Schedule I substance (a drug that has been classified by the federal government as having no medical purpose, and which is at high risk for abuse). Unfortunately, the highly

addictive drug is now entering the club scene. Users abuse GHB for its intoxicating effects, and many believe it is an aphrodisiac...

Side effects caused by lower doses include drowsiness, dizziness, nausea, and visual disturbances, while higher dosages can lead to unconsciousness, seizures, severe respiratory depression (especially when combined with alcohol), and even coma. According to the Substance Abuse and Mental Health Services Administration, emergency room visits involving GHB nearly quadrupled from 1998 to 2000. In fact, GHB overdoses are reportedly more common than MDMA overdoses, although abuse is much more prevalent. In 2000, 2,482 GHB users were treated for an overdose, as compared with 1,742 Ecstasy users, a nearly 30% increase, according to an article in USA Today. Signs of overdose include drowsiness, nausea, vomiting, headache, loss of consciousness, loss of reflexes, impaired breathing, and ultimately death.10 According to the DEA, 73 people have also died from GHB since 1995. By contrast, there have been 27 Ecstasy-related deaths from 1994 to 1998, the most recent available statistic as reported by USA Today."