

## English summary

Ecstasy has become one of the most prevalent party drugs. In combination with its potential harmfulness and the inefficacy of legislative measures that is evidenced by its prevalence, this justifies development of health promotion interventions aiming to regulate its use. The current thesis reports the results of studies aiming to inform such intervention development. The first chapter briefly outlines the history, social-cultural context, and effects of the drug ecstasy. Then, the results are provided of a needs assessment that identified the specific behaviours to be addressed in interventions aiming to regulate ecstasy use. The following behaviours were identified: trying out ecstasy; ceasing ecstasy use; refusing offered ecstasy; not using more than once every four to six weeks; not using more than 1.5 mg MDMA per 1 kg of bodyweight; getting ecstasy pills tested at a testing facility before use; sleeping at least eight hours in the three nights before use; drinking two litres of water on each of the three days before use; drinking half a litre of water hourly during use; chilling out for at least 20 minutes every two hours during use; and not combining ecstasy with alcohol, cocaine, speed or GHB.

To synthesise the state of the art regarding the determinant configurations (the relative relevance of a behaviour's determinants) of these behaviours identified in the needs assessment, a meta-analysis was conducted, and its results are reported in chapter 2. Although this meta-analysis' database query was deliberately designed to include publications about all behaviours related to ecstasy use, only publications addressing the behaviour 'using ecstasy' were found. Through quantitative synthesis of these studies, the determinant configuration of 'using ecstasy' emerged. The most relevant determinants were attitude (specifically positive outcomes regarding mood control and social facilitation, and negative outcomes regarding escalating use and physical and mental side effects); subjective and descriptive norms regarding one's friends, partner and peers; perceived control regarding obtaining ecstasy and control in relation to being with friends who use, going out dancing, being offered ecstasy

and ecstasy being available; habit; moral norm; and anticipated regret. This determinant configuration provides an evidence base for interventions addressing the behaviour “using ecstasy”. However, it is not known whether it can also guide interventions that target any of the behaviours that were identified in the needs assessment. Although it could be argued that the behaviour ‘using ecstasy’ is a generic behavioural category that encompasses specific behaviours (e.g. trying out ecstasy, ceasing ecstasy use, and using less frequently), determinant configurations of related but different behaviours may differ (Ajzen, 1991; Eves et al., 2003; Fishbein et al., 2001). The meta-analysis therefore suggests that the literature lacks a reliable evidence base for interventions addressing any of the behaviours suggested by the needs assessment.

Because of its quantitative nature, the meta-analysis employed very severe inclusion criteria. These inclusion criteria may have caused exclusion of studies that contain valuable non-quantitative information about potential determinants of a behaviour. To address this possibility, a qualitative review was conducted that summarised all studies into the reasons of ecstasy use and related behaviours that were excluded by the meta-analysis. The results are reported in chapter 3. This review indicated that there are different reasons for starting ecstasy use, ceasing ecstasy use, using ecstasy, and other related behaviours. This suggests that the determinant configurations of starting or ceasing ecstasy use do differ from that of using ecstasy. Furthermore, for those reasons that were reported both in the qualitative review and in the meta-analysis, results sometimes diverged. Although most did, not all reasons that were reported frequently in the review corresponded to beliefs that were meaningfully associated to intention of behaviour in the meta-analysis (i.e. Cohen’s  $d < .2$ ; Cohen, 1992). Finally, it appeared that many ecstasy users cease use automatically due to a change in life circumstances or loss of interest.

The meta-analysis and the review yielded three conclusions of particular relevance. First, only the determinant configuration of the behaviour ‘using ecstasy’ has been studied quantitatively. Second, this determinant configuration need not be predictive of the determinant configurations of other behaviours. Third, ecstasy use-related interventions may do better to target harm reduction strategies than to try to induce cessation. Because the literature provides no evidence base regarding the determinant configurations of the behaviours specified by the needs assessment, it was concluded that new research was required to map these determinant configurations and thereby enable evidence-

based intervention development. Of the 33 studies into determinants or reasons of ecstasy use that were included in the literature overview in chapters 2 and 3, only 2 had been conducted in the Netherlands. These results may not generalise to the Netherlands, so new research in the Netherlands may not be able to use the results from the studies synthesised in chapters 2 and 3 as a starting point. In addition, in determining which behaviours should be targeted by an intervention, it seems useful to verify whether users indeed cease use automatically.

To study the Dutch situation, as well as to address whether Dutch users cease use automatically, a qualitative study was conducted among among 32 Dutch dance scene participants. The results are reported in chapter 4. This study showed that ecstasy use patterns in the Netherlands indeed appear similar to those in the US, UK and Australia. In addition, it confirmed that cessation of ecstasy use appeared to occur mostly automatically when users moved to what they themselves described as ‘the next phase’. The first finding meant that the determinants resulting from the meta-analysis about ‘using ecstasy’ may provide a starting point for new quantitative research in the Netherlands. Although it is likely that determinants of other behaviours will turn out to differ, whether this is the case can only be decided through such research. The second finding implied that it seems unwise to develop interventions that aim to induce ecstasy use cessation. Large-scale quantitative verification was needed to further inform a decision as substantial as whether or not to target cessation.

To map the determinant configurations of each of the 14 behaviours suggested in the needs assessment, an online survey was conducted. To enable comparison of the determinant configurations of these behaviours with that of ‘using ecstasy’, this behaviour was also included. In chapters 5, 6, and 7, the determinant configurations of using ecstasy, trying out ecstasy and ceasing ecstasy were reported. In chapter 8, a comparative study is reported. The results indicated that although among non-users, the determinant configurations of trying out ecstasy and using ecstasy were quite similar (i.e. the determinants that were relevant for using ecstasy were also relevant for trying out ecstasy), among ecstasy users, the determinant configurations of using ecstasy and ceasing ecstasy use were different (i.e. the determinants that were relevant for using ecstasy were not always relevant for ceasing ecstasy use). In addition, the determinant configuration of using ecstasy was different for non-users than for users (i.e. determinants of using ecstasy that were relevant for users were not

always relevant for non-users). Further, when a determinant distinguished between non-users and ecstasy users, it did not always predict intention to use in either of the two groups (i.e. determinants on which users scored substantially higher than non-users were not always associated to intention to use in either of the two groups).

These findings have a number of implications for the usefulness of studies into the determinants of ecstasy use for intervention development. First, results from studies into the determinants of using ecstasy among non-users do indeed constitute evidence to base interventions on, but only when samples comprised exclusively non-users. Second, results from studies into the determinants of using ecstasy among users cannot be considered as evidence base for interventions targeting cessation. Third, studies comparing non-users and users cannot inform intervention development regarding trying out ecstasy or ceasing ecstasy use. Furthermore, regarding ceasing ecstasy use, the determinants explained at most 37% of the variation in intentions. Combined with the results of the qualitative study, this indicates that relevant determinants have not been measured. This is consistent with the possibility that users cease ecstasy use due to factors such as a loss of interest or a change in life circumstances. For all three behaviours, intention strongly predicted subsequent behaviour. Regarding the determinant configuration of trying out ecstasy, attitude, moral norm and anticipated regret had large associations with intention to try out ecstasy. Subjective norm and the expectation that ecstasy makes one feel very good had moderate associations with intention. Regarding the determinant configuration of ceasing ecstasy use, only attitude was associated strongly to intention to cease. Subjective norm, subjective norm relating to parents, descriptive norm relating to best friend and friends, moral norm, and the expectation that ecstasy damages one's health had moderate associations with intention.

The results of the syntheses of the literature, the interview study, and these quantitative results all suggest that most ecstasy users cease their ecstasy use after a number of months or years without the need for an intervention. This implies that evidence-based interventions aiming to minimise ecstasy-related damage may be more efficient if they aim to promote harm reduction strategies (HRSs) rather than cessation. Getting ecstasy tested at a testing facility seems a very important harm reduction strategy. In chapter 9, data allowing the mapping of this determinant configuration is reported, and additionally, results of a small-scale exploratory study. Regarding the

determinant configuration of testing ecstasy, habit was associated to intention to test very strongly. Attitude, descriptive norm, and anticipated regret had strong associations, and perceived behavioural control had a moderate association. Regarding the exploratory measures, it appeared that most participants estimated the proportion of adulterated pills to be lower than this was in reality. In addition, a substantial proportion of participants expected adulterated pills to contain poison. Yet, many participants were willing to consume untested pills, particularly when friends claimed to have used pills from the same batch already. Perceived susceptibility of obtaining adulterated pills thus seemed very low.

In all, the social cognitive approach used in this thesis provided relevant determinants of the addressed behaviours. However, it was also clear that environmental variables should be taken into account, and there likely remain personal variables that can be useful additions to the tested models. Also, the reported quantitative studies showed how useful the internet can be in examining determinant configurations of multiple behaviours with a largely hidden population such as recreational illicit drug users. Furthermore, on the basis of these studies, three conclusions can be drawn that have particularly general implications. First, research into behavioural determinants should complement qualitative and quantitative methodologies. This applies not only to empirical research, but also to literature syntheses. Second, determinant configurations should be considered behaviourally specific. Determinants of a behaviour need not be the same for related behaviours (i.e. determinants of using ecstasy can differ from determinants of ceasing ecstasy use). In addition, among people who regularly perform a behaviour (e.g. ecstasy users), this behaviour can be predicted by different determinants than among people who do not regularly perform that behaviour (e.g. non-users). Also, determinants that differ between such groups need not predict intention in either of those groups. Third, ecstasy use interventions should aim at promoting harm reduction, rather than abstinence. Because most ecstasy users appear to cease of their own accord, more health benefits can be achieved by promoting correct and consistent application of harm reduction strategies.