Fear, rationality and opportunity: Reasons and motives for not trying ecstasy

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Abstract

Aim: To gain more insight into the reasons and motives why people do not start taking ecstasy.

Method: As part of the NeXT Study, we prospectively monitored 188 subjects who were ecstasy-naïve at baseline but seemed likely to take ecstasy (MDMA) of their own accord during the course of the study. After an 11- to 26-month follow-up period, 160 respondents remained (85.1%). Among these, 65 participants started taking ecstasy (novel ecstasy users, NEUs) and 95 did not (persistent non-users, PNUs). Several times during their participation, subjects completed lists of reasons and motives for not taking ecstasy.

Findings: Principal components analysis identified three main factors associated with non-use: rationality (factor score 0.491), lack of opportunity (0.229) and fear of the effects of ecstasy (0.211). At baseline, PNUs scored higher than NEUs on all three factors. For the NEUs, no significant changes occurred over the course of the study in all three factor curves. Slight shifts were seen for PNUs—the fear of effects diminished and lack of opportunity grew; scores on rationality remained constant.

Conclusions: NEUs and PNUs were distinguished most clearly by their factor scores on rationality. Some valuable insights for prevention are discussed.

Introduction

While considerable knowledge is now available about why people use drugs (Boys, Marsden, & Strang, 2001; Fendrich, Wislar, Johnson, & Hubbell, 2003; Soellner, 2005; ter Bogt & Engels, 2005), surprisingly little is known about the reasons and motives why many others do *not* take drugs. Drug-prevention

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activities are often inspired by knowledge about current or former drug users. In this article our assumption is that new, refreshing insights, potentially useful for drug education, can be gained by studying drug use from a different angle—that of non-users.

Sociological, criminological and psychological theories can offer frameworks for the understanding of non-use. Social learning theory stresses the importance of the social environment in the learning process (Akers, 2000; Bandura, 1977; Sutherland, 1947). Individuals learn new behaviours from observation, modelling and imitation of others, such as peers and family. Peers serve as influential role models, both by their own substance use and their attitudes toward substance use, which might contribute strongly to adolescent's substance use behaviour (Petraitis, Flay, & Miller, 1995). In this view, young people's abstinence of drug use is the result either of their peers' abstinence or of their own high levels of refusal assertiveness and resistance skills. Several drug-prevention programs are based on the principles of this theory and focus on training resistance skills (Cuijpers, 2002; Longshore, Ghosh-Dastidar, & Ellickson, 2006). Other theories highlight individual decision-making processes. According to the rational choice theory (Cornish & Clarke, 1986), people apply an informal cost-benefit analysis in which they weigh the expected advantages of substance use against their fear of physical, psychological or social harm. There is some evidence that substance use can be regarded as a rational decision process (Ferguson, 2006). Prochaska and DiClemente's transtheoretical model of change (1983) consists of five successive stages: precontemplation, contemplation, decision making, action and maintenance. It has been applied successfully in the study of smoking cessation (Spencer, Pagell, Hallion, & Adams, 2002), substance-use initiation (Johnson et al., 2006; Stern, Prochaska, Velicer, & Elder, 1987) and other addictive (Prochaska, DiClemente, & Norcross, 1992) and health behaviours (Rosen, 2000). At the decision-making stage, respondents are balancing the positive and negative consequences, while subjects in previous or subsequent stages place greater emphasis on either one (Stern et al., 1987).

A common feature of these theories is the balancing of pros and cons. In this article we explore these 'cons'. Our focus is not on the learning process of *how* people acquire motives and reasons for non-use, but on their *content*. However, this is a largely uncharted area. In the UK Fountain et al. (1999) questioned 100 young people aged 13–22 about their reasons for not taking a range of drugs. The motives most frequently reported for not using ecstasy by those who had never used it ($n = 61$) were a fear of the psychoactive effects (43%) and a fear of bodily harm (33%). In contrast to most other drugs queried in the survey, a lack of interest in the effects was only a minor motive for not taking ecstasy (18%). Not a single respondent mentioned fear of addiction as a reason for not using ecstasy, whereas this was a prominent motive for them not to take cocaine (particularly crack) or heroin. McIntosh, MacDonald and McKeganey (2005) interviewed 216 pre- and early adolescents aged 11–14, including 43 who had been offered but had not tried drugs. Lack of interest in the effects was the main reason; they considered their lives satisfying without drugs. Some were frightened

of drugs. The illegality of certain drugs appeared to have virtually no influence on the decision not to take them. In a site survey among 702 party visitors ('ravers') in three European cities by Benschop, Rabes and Korf (2002) most respondents were in their late adolescence or early adulthood. The study included 216 respondents who had never taken ecstasy, whose average age was 21.6 years (range 14–43). From a list of possible motives for not taking ecstasy, personal preferences and fear of harm were reported often. Frequently selected personal preferences were 'I don't feel the need for a stimulant' (74%), 'I'm against it because of principle or ideology' (71%) and 'I have no need for a consciousness-altering drug' (68%). The most common answers relating to fear of harm were 'You never know what you're taking' (67%), 'I think it would be harmful to my body' (64%) and 'I think it might damage my brain' (62%). Just 39% were afraid of becoming addicted. Only 20% of non-users reported avoiding ecstasy as a result of warning leaflets, and only 16% because they didn't know where to get the drug. Similar results emerged from a later field study that included 138 non-users in several Dutch cities (Korf, Benschop, & Brunt, 2003).

This article specifically explores the motives and reasons that young people have for not using ecstasy (MDMA). We report here the results of a longitudinal study carried out in Amsterdam. We monitored 188 subjects who were ecstasy-naïve at baseline, but seemed likely to start taking ecstasy in the near future. Within an 11- to 26-month follow-up period, some respondents indeed took ecstasy—we refer to them as novel ecstasy users (NEUs); the remainder are called persistent non-users (PNUs). This study is unique because it prospectively investigates why some people choose not to take ecstasy. At baseline and several times during follow-up, respondents completed a list of preformulated potential motives and reasons for not taking ecstasy.

Our first objective was to clarify which motives and reasons were important, and which were insignificant, in the non-use of ecstasy. The second objective was to investigate whether motivational patterns regarding non-use could be derived. We used a factor analysis to determine whether different components were distinguishable in the motivations for non-use and how much relative weight these carried. We then determined whether motivational differences between NEUs and PNUs already existed at baseline, when no subjects had ever taken ecstasy. Finally, the prospective nature of the study enabled us to examine whether the motivations reflected by the factor scores changed in the course of the study and whether the process of change took a different course for those who either began or did not begin taking ecstasy.

Method

Study design

The Netherlands XTC Toxicity Study (NeXT) is a longitudinal multidisciplinary project (de Win et al., 2005). All respondents completed baseline questionnaires and underwent medical and neuropsychological examinations at baseline, when

none had ever taken ecstasy, and throughout the course of the study, when some had started taking ecstasy and others had not. Four follow-up assessments were made during an 11- to 26-month period (mean 16 months) through written self-report questionnaires.

Our study design was approved by the Medical Ethics Committee of Amsterdam's Academic Medical Centre. All participants were required to sign informed consent documents acknowledging that their participation was voluntary, that ecstasy was possibly harmful and that it was not the intention of the researchers to encourage the use of ecstasy. Respondents received compensation for completing the questionnaires (€5 to €10) and for the medical examinations (€100 to €150).

Sample

A total of 188 respondents were actively recruited using a combination of targeted sampling (at dance events, clubs, youth festivals, universities, colleges, city parks and other locations), advertising on the project website, an Internet campaign, and snowball referrals. To increase the probability of securing participants who would start using ecstasy during the study, we focused the recruitment on people aged 18 years and older who had an express future intention to use it and/or whose circle of friends included some ecstasy users. For a more detailed description of the sampling procedures see Vervaeke, Korf, Benschop and van den Brink (in press).

Twenty-eight respondents (14.9%) were lost to follow-up. Non-response analysis showed that loss to follow-up was not related to respondent socio-demographic characteristics.

Of the 160 participants remaining after the fifth and final assessment, 65 (40.6%) took ecstasy during the follow-up period (on average on 4.0 occasions, $SD = 6.1$, median = 2; averaging 6.7 pills in total, $SD = 12.1$, median = 2). At the end of their follow-up period, on average 8.7 months ($SD = 5.8$) had passed since their first-time ecstasy use. NEUs did not differ from PNUs ($n = 95$) in terms of gender, age, ethnicity, housing status or employment status. Although NEUs' follow-up period was slightly longer (mean 17.2, median = 16 vs. mean 15.5, median = 15 for PNUs; $p = 0.001$), it does not seem plausible that this has had a noticeable effects on the results.

Measures

Questionnaires were self-administered and included items on the prevalence of drug use (life time, last year and last month), intention to use ecstasy and peer-group ecstasy use, amongst others. From the first follow-up assessment onwards, respondents were also asked whether they had taken ecstasy in the interim. Respondents, as long as they had not taken any ecstasy, completed a list of 24 preformulated potential motives and reasons for not taking ecstasy (see Table II). Items covered areas such as availability of the drug, illegality, perceived physical and psychological effects and personal preferences. Most of these items

were derived from the work of Fountain et al. (1999) and/or Benschop et al. (2002) and were supplemented by some items specifically designed for the present study. Respondents answered 'yes' (coded 1) or 'no' (0) to each of the motives or reasons listed.

Statistics

Basic bivariate statistics were computed using Pearson χ^2 analyses, independent samples *t*-tests and Fisher's exact tests. Responses to the motivational items in all 629 available assessments were submitted to principal components analysis, using promax oblique rotation in view of the likely correlations between factors in the social sciences (Costello & Osborne, 2005). There were 188 available assessments at baseline (t_0 , when no one had taken ecstasy), 133 at t_1 (24 NEUs, 31 failed to respond), 117 at t_2 (34 NEUs, 37 failed to respond), 96 at t_3 (34 NEUs, 58 failed to respond), and 95 at t_4 (65 NEUs, 28 failed to respond). Missing values (only 11 in a total of $629 \times 24 = 15,096$ values) were replaced by the total mean.

The optimum number of factors was identified using a scree plot. Three factors were retained (eigenvalues 4.245, 2.047 and 1.886). The cutoff point for significant loadings was set at 0.45, as many items fell just below the 0.50 threshold. Factor scores were calculated by summing the scores of items with significant loadings on the factor in question and dividing that sum by the number of items. Items with negative factor loadings were reverse-scored before calculation. Changes in factor scores were examined in a linear mixed model for repeated measures with an unstructured covariance matrix. For PNUs, the number of months after baseline was entered as a fixed-effect covariate; for NEUs, the number of months before first ecstasy use was entered. All analyses were carried out using SPSS (version 13.0). Statistical significance was accepted at $p \leq 0.05$.

Results

Sample characteristics

Sample characteristics are summarized in Table I. Mean age at baseline was 21.2 years ($SD = 3.0$). Females (59.0%) outnumbered males, but the two genders did not differ significantly in terms of age. The large majority (85.1%) were students or secondary school pupils.

Half the respondents (51.6%) had smoked tobacco in the past month. Last-month prevalence of alcohol (96.2%) and cannabis was high (45.2%), but much lower for other illicit drugs (4.8% cocaine, 1.6% amphetamines, 0.5% for LSD, 0.0% heroin).

Motives for not taking ecstasy

Table II lists the 24 motives and reasons for non-use at baseline. The most frequently reported reason was: 'I haven't got round to taking it yet'. The second was: 'You never know what you're taking'. Brain damage and physical harm were

Table I. General characteristics of respondents ($N=188$).

<i>Gender</i>	
Male	41.0%
Female	59.0%
<i>Age</i>	
Mean, in years (SD)	21.2 (3.0)
Range	18–35
<i>Ethnicity*</i>	
Western	90.4%
Non-Western	9.6%
<i>Housing status</i>	
Parental home	26.6%
Shared household	25.5%
Single household	47.9%
<i>Employment status</i>	
Students/pupils	85.1%
Employed	12.8%
Unemployed/job-seeking	2.1%
<i>Education</i>	
Vocational/lower secondary	9.0%
Middle secondary	14.9%
Higher	76.1%

Note: *Ethnicity was determined according to the standard Dutch procedure based on the parents' country of birth.

other prominent motives. In contrast, most respondents did not cite 'warning leaflets' or 'because it's illegal'. Males and females did not differ in 21 out of 24 motivational items at baseline. Women were significantly more likely than men to report: 'I don't know what would happen if I took it' (43.2% vs. 23.4%; $p=0.005$); 'I have seen bad stories about ecstasy in the media' (45.0% vs. 28.9%; $p=0.026$); and 'I'm afraid I'll just feel worse afterwards' (31.5% vs. 16.9%; $p=0.024$).

Principal components analysis

The factor pattern matrix of the three factors extracted in the principal components analysis is presented in Table III. Items that failed to achieve significance were consistent with the factors on which they had the highest loadings. No significant cross-loadings were found. Factors 1 and 2 were correlated at $r=0.351$ ($p<0.001$); factor 3 did not show significant correlations with the other factors.

Factor 1 accounted for 17.7% of the variance and had significant loadings for 8 items (Cronbach's $\alpha=0.69$). These items relate to a fear of the effects of ecstasy, often based on negative reports and stories. This first factor involving affective reasons and motives was labelled 'fear of effects'. Factor 2 (8.5% of variance) had significant loadings for 5 items (Cronbach's $\alpha=0.70$). Four items reflect conscious decisions and knowledge of risks. The fifth item ('I haven't got round to taking it yet') showed a strong negative loading with this factor,

Table II. Preformulated motives and reasons for not taking ecstasy, at baseline (%).

Reasons and motives for non-use at baseline	Entire sample (n = 188)	Future users (n = 65)	Persistent non-users (n = 95)	Difference
<i>Factor 1: Fear of effects</i>				
You never know what you're taking	64.7	56.9	66.3	ns
I've seen bad stories about ecstasy in the media	38.5	35.4	42.1	ns
I don't know what would happen if I took it	35.1	27.7	38.9	ns
The testing services often find bad ecstasy	25.0	20.0	26.3	ns
I've heard bad stories about ecstasy from friends	21.3	20.0	20.0	ns
I'm afraid of getting addicted	13.3	7.7	13.7	ns
I take the warning leaflets about ecstasy seriously	5.9	0.0	10.5	p = 0.005**
I have medical reasons not to take it	0.5	0.0	1.1	ns
<i>Factor 2: Rationality</i>				
I haven't got round to taking it yet (negative loading on factor)	72.9	76.9	70.5	ns
I think it's harmful to the brain	58.8	48.4	65.3	p = 0.035*
I think it's harmful to the body	55.3	41.5	63.2	p = 0.007*
I don't feel like I need a consciousness-altering drug	39.9	30.8	48.4	p = 0.026*
I don't feel like I need a stimulant	39.4	40.0	43.2	ns
<i>Factor 3: Lack of opportunity</i>				
Nobody ever offered me any ecstasy	33.0	26.2	43.2	p = 0.028*
Nobody around me ever takes ecstasy	13.8	10.8	18.9	ns
I don't know where to get ecstasy	9.0	9.2	9.5	ns
<i>Non-factor</i>				
I think it's psychologically harmful	41.5	30.8	46.3	p = 0.049*
I've seen what happens when other people take it	29.3	29.2	28.4	ns
I'm afraid I'll just feel worse afterwards	25.5	23.1	25.3	ns
Ecstasy is too expensive	15.4	9.2	17.9	ns
I already use some other substance	13.8	24.6	6.3	p = 0.001*
I'm against it in principle	13.3	9.2	15.8	ns
Someone I know ended up in hospital because of ecstasy	4.3	3.1	2.1	ns
It's illegal	2.1	0.0	4.2	ns

Note: *Chi square test. **Fisher's exact test.

Table III. Factor pattern matrix from principal components analysis with promax oblique rotation (significant factor loadings > 0.45, in bold).

Reasons and motives for non-use	Factor 1: fear of effects	Factor 2: rationality	Factor 3: lack of opportunity
The testing services often find bad ecstasy	0.602	-0.060	0.022
I have medical reasons not to take it	0.600	-0.248	0.018
I've seen bad stories about ecstasy in the media	0.600	0.122	0.070
I'm afraid of getting addicted	0.598	-0.047	0.072
I've heard bad stories about ecstasy from friends	0.493	0.012	-0.188
I take the warning leaflets about ecstasy seriously	0.491	-0.122	0.139
You never know what you're taking	0.468	0.258	0.015
I don't know what would happen if I took it	0.461	0.085	0.244
I'm afraid I'll just feel worse afterwards	0.383	0.284	-0.013
Ecstasy is too expensive	0.374	0.016	0.252
I don't feel like I need a consciousness-altering drug	-0.279	0.848	0.848 0.131
I don't feel like I need a stimulant	-0.350	0.811	0.161
I haven't got round to taking it yet	-0.036	- 0.532	0.078
I think it's harmful to the body	0.255	0.507	-0.185
I think it's harmful to the brain	0.276	0.485	-0.193
I think it's psychologically harmful	0.325	0.414	-0.223
I'm against it in principle	0.027	0.355	0.026
It's illegal	0.144	0.352	0.277
I already use some other substance	0.008	-0.237	-0.181
Nobody ever offered me any ecstasy	0.269	-0.044	0.721
Nobody around me ever takes ecstasy	0.063	0.157	0.679
I don't know where to get ecstasy	0.178	-0.013	0.678
I've seen what happens when other people take it	0.157	0.114	-0.342
Someone I know ended up in hospital because of ecstasy	0.221	-0.146	-0.265

suggesting that lack of convenience is the antithesis of avoiding ecstasy on the basis of knowledge and choice. This second factor involving cognitive reasons and motives was designated as 'rationality'. Factor 3 (7.9% of variance) had significant loadings for 3 items (Cronbach's $\alpha = 0.61$). These involve the availability of ecstasy in the respondents' environments. The third factor was called 'lack of opportunity'.

The factor scores averaged 0.211 for fear of effects ($SD = 0.211$), 0.491 for rationality ($SD = 0.326$) and 0.229 for lack of opportunity ($SD = 0.308$).

Did NEUs and PNUs show different motivations at baseline for having never taken ecstasy? For 17 of the 24 listed potential reasons and motives for non-use at baseline, no differences were evident between NEUs and PNUs (Table II). Nevertheless, at baseline PNUs did show significantly higher scores than NEUs on all three factors—scores for PNUs versus NEUs were 0.274 vs. 0.208 ($p = 0.038$) on fear of effects; 0.499 vs. 0.368 ($p = 0.009$) on rationality; and 0.239 vs. 0.154 ($p = 0.050$) on lack of opportunity. Of the affective reasons making up the first factor (fear of effects), 'I take the warning leaflets about ecstasy seriously', although not a salient motive for PNUs, was significantly more important for PNUs than for NEUs, because not a single NEU choose that item

Figure 1. Factor scores for novel ecstasy users (NEUs) and persistent non-users (PNUs). PNU: (1) baseline; (2) 4–6 months after baseline; (3) 7–9 months after baseline; (4) 10–12 months after baseline; (5) >12 months after baseline. NEUs: (1) >12 months before first use of ecstasy; (2) 10–12 months before first use of ecstasy; (3) 7–9 months before first use of ecstasy; (4) 4–6 months before first use of ecstasy; (5) 0–3 months before first use of ecstasy. ● = Fear of effects; ■ = rationality; ▲ = Lack of opportunity.

at baseline. Three of the five cognitive motives making up the second factor (rationality) differed significantly between NEUs and PNUs at baseline. PNUs were more likely to indicate at baseline that they felt no need for a consciousness-altering drug, or that they believed ecstasy could harm their brain or their body. Among the lack of opportunity reasons (factor 3), PNUs were more likely to indicate at baseline that ecstasy had never been offered to them. Finally, two non-factor items differed significantly between NEUs and PNUs at baseline ('I think it's psychologically harmful' and 'I already used some other substance').

Figure 1 depicts the average scores on the three factors for NEUs and PNUs over the course of the study. For PNUs average scores are plotted against the number of months since baseline; for NEUs against the number of months before initiation of ecstasy use. At baseline, NEUs were at different stages on their road to becoming ecstasy users. Some were to start taking the drug within 6 months after baseline, while others after more than a year. As NEUs proceed towards initiation of use, the mixed-models analysis of repeated measures found no significant changes over time in fear of effects ($B = -0.003$, $p = 0.080$), rationality ($B = -0.000$, $p = 0.974$), or lack of opportunity ($B = -0.000$, $p = 0.969$). By contrast, for PNUs the mixed-models analysis showed a slight weakening of the fear of effects factor ($B = -0.003$, $p = 0.017$) and a slight strengthening of the lack of opportunity factor ($B = 0.005$, $p = 0.002$); their scores on rationality did not change significantly ($B = 0.003$, $p = 0.060$).

Discussion

The aim of our study was to gain more insight into the reasons and motives why people do not start taking ecstasy. First, factor analysis indicated that reasons for not using ecstasy can be categorized into three factors: fear of the effects of the

drug, rationality, and lack of opportunity. Second, at baseline (when none had ever taken ecstasy), the persistent non-users (PNUs) in the sample scored higher than the novel ecstasy users (NEUs) on all three factors. Third, rationality is the factor that best distinguished NEUs from PNUs. Fourth, for the NEUs, no significant changes occurred over the course of the study in all three factor curves. Slight shifts were seen for PNUs—the fear of effects diminished and lack of opportunity grew; scores on rationality remained constant.

Which motives and reasons were important, and which were insignificant, in the non-use of ecstasy? At the start of this longitudinal study, when none of the respondents had ever taken ecstasy, almost three quarters of them said that was because they had not yet got around to trying it. This reflected the composition of our sample, which consisted mainly of respondents who had expressed an intention to try the drug in the near future. It clearly distinguished our sample from the non-users of ecstasy studied by Benschop et al. (2002), only a quarter of whom mentioned that motive. The motive ‘You never know what you’re taking’ was cited at baseline by over 60% of our respondents; other motives for not taking ecstasy reported by more than half of our respondents at baseline involved potential brain injury or other physical harm. This is comparable to the non-users in the Benschop study (2002). The vast majority did not mention fear of addiction (11.3%); this was consistent with the findings by Fountain et al. (1999), but less than in the Benschop study (2002), where 39% mentioned that reason.

A key question was whether particular sets of the preformulated motives and reasons presented to the respondents would reflect common patterns. Several of the listed reasons and motives, for example, were related to the availability of the drug. We explored such underlying associations in a principal components analysis, trying to condense the detailed list into a few relevant components. Three factors emerged from the analysis. We designated factor 1 as fear of effects, because its items refer to fear of effects of ecstasy, often based on negative reports and stories. The items loading on factor 2 (rationality) reflected conscious decisions (such as ‘no need for a consciousness-altering drug’) and knowledge about the harmfulness of the drug (particularly injury to body and brain). Factor 3 (lack of opportunity), involved the availability of ecstasy in the respondents’ environments. The procedure thus enabled us to distinguish three behavioural or attitudinal components. Together these factors explained 34.1% of the variance. Rationality played the most important role in the motivation of young people not to start taking ecstasy. At baseline, the PNUs in the sample scored higher than the NEUs on all three factors. Rationality is the factor that most sharply distinguished both groups. Altogether, PNUs expressed more reasons and motives than NEUs for the non-use of ecstasy.

Our next research question was whether the motivations changed in the course of the study and whether this process took a different course for the NEUs and PNUs. As NEUs progressed towards the initiation of ecstasy use during the course of the study, no significant changes occurred in the fear of effects, rationality and lack of opportunity factor curves. Given this apparent stability in

these motivation components, the motives and reasons for not using ecstasy may have been overridden in this decision by other aspects. Possibilities include peer influence, life events and other such factors. Nor can we rule out that changes in their motivation not to use ecstasy had already taken place before our study began, though that seems less likely for the many respondents who did not start taking ecstasy until late in the study (some of them more than a year after baseline). We were able to monitor these respondents for a considerable length of time on their way towards ecstasy initiation.

For two of the factor scores of the PNUs, by contrast, there were small, but significant changes over the course of the study. Their fear of the effects of ecstasy diminished slightly and they reported a growing lack of opportunity to take ecstasy. This implies, first, that the non-users became less afraid of trying ecstasy. They may have been deterred from taking ecstasy in the beginning by the drugs education information they received during the sample selection procedure (a brochure that included explanations of the effects and risks of ecstasy), after which the fear subsided. Second, the rising scores on the lack of opportunity factor suggests that PNUs may have 'grown away' from access to the drug. The scores of the non-users on the rationality factor did not change over the course of the study. A significant consideration is that the PNUs' factor scores on fear of effects declined slightly, but that this did not appear to affect their rationality score. In other words, even though their fears of the drug's effects diminished, that did not alter their rational motives not to take ecstasy.

We are well aware that this study has some limitations. First, as the sample was not randomly selected, we cannot claim it is representative of the population of people who are considering experimenting with ecstasy. The sample is sufficiently varied, however, since we contacted candidates in many different places and ways. In any event, because the medical and neuropsychological components of this study placed very specific demands on the inclusion of respondents (de Win et al., 2005; Vervaeke et al., *in press*), even an initially random sample would have almost certainly reached a selective group in the end.

A second limitation derives from the fact that all respondents had to sign informed consent documents acknowledging that their participation was voluntary, that ecstasy could be harmful and that the researchers did not intend to encourage ecstasy use. When they registered for the study, all respondents also received a detailed educational brochure about the potentially harmful effects of ecstasy. Giving respondents information about ecstasy, including the potential negative consequences, might have influenced their decision whether or not to take the drug.

A third limitation lies in this study's particular focus on motives and reasons for not taking ecstasy. We realize that other aspects such as intention to use ecstasy (the majority of the sample had a high intention to use ecstasy in the near future, but there was some variation), peer-group dynamics or other drug use may also affect decisions on whether or not to take ecstasy. Indeed, NEUs stated significantly more often than PNUs at baseline, when asked about their reasons for not taking ecstasy, that they already used another substance, which is in

accordance with literature indicating that most ecstasy users are polydrug users (Barrett, Gross, Garand, & Pihl, 2005; Carlson, Wang, Falck, & Siegal, 2005; Duff, 2005; Korf, Nabben, & Benschop, 2004; Scholey et al., 2004; Sherlock & Conner, 1999; Sterk, Theall, & Elifson, 2006) and that prior use of one substance can be a risk factor for the initiation of another substance (Kokkevi, Richardson, Florescu, Kuzman, & Stergar, in press; Kostecky, 2005; Swadi, 1999). The aim of this article was not to unravel the full decisional process on whether or not to take ecstasy, but on motivations for non-use only. Predicting (non-)use of ecstasy, by taking into account several variables next to the reasons for non-use, is the topic of a subsequent paper.

Do our results offer insights for the prevention of drug use? Evidently, statutory penalization does not have the deterrent effects on the use of ecstasy that are intended by international anti-drugs agreements or national legislation. Indeed, there is little scientific evidence that law enforcement and drug interdiction policies have been effective in reducing substance use (Morin & Collins, 2000). More generally, from a criminal justice policy perspective, the deterrent influence from legal sanctions is limited (Akers, 2000; Inciardi, 1999; Paternoster, 1989). As noted before, McIntosh et al. (2005) have shown that young adolescents rarely mention illegality as a reason not to take drugs. Our results appear to confirm this, as the illegal status of ecstasy was also not an issue for our somewhat older respondents, with only 2.5% mentioning it as a reason not to take the drug. If penalization does not work as intended, then, can drugs education help?

Generally prevention programs are directed at the prevention or reduction of substance use. However, meta-analyses have shown that most prevention programs are not effective, although some well-designed universal (school-based) drug-education programs can reduce substance use to some degree (Cuijpers, 2002; White & Pitts, 1998). 'Knowledge only' or 'scare tactics' approaches failed to decrease substance use initiation (Botvin & Kantor, 2000; Rosenbaum, 1998). The best drug-education programs are so called 'competence enhancement programs' combining informational aspects (knowledge, attitudes and norms) and the development of resistance and social skills (Plant & Plant, 1999). However, effects of interventions are generally small and decline with time (Gorman, 2002; White & Pitts, 1998). Increasingly, prevention programs are adopting harm-reduction principles in an effort to minimize harm associated with drug use (Inciardi & Harrison, 2000; Neighbors, Larimer, Lostutter, & Woods, 2006; White & Pitts, 1998).

Although behavioural change is a difficult thing to achieve, we hope the motives and reasons identified here for not taking ecstasy offer some valuable insights for prevention. Our principal components analysis revealed that rationality was the most important factor for all respondents in their reasons for not using ecstasy, and that it was also the component in which NEUs and PNUs differed from one another most distinctly. At the same time, it was the factor which did not seem to change much over time, either amongst the NEUs (whom one might have expected to show a decline as the occasion of first ecstasy use approached)

or amongst the PNUs (for whom one might expect the factor to strengthen over time).

What does that all mean for drug education? A closer look at the items that make up the rationality factor reveals that two of them reflected attitudes toward ecstasy use: feeling no need for (1) a consciousness-altering drug, or (2) a stimulant. Two other items of that factor reflected knowledge about ecstasy's potential harmful effects on (1) the body, and (2) the brain. Indeed, competence-enhancement prevention programs are focusing, next to resistance and social skills, on influencing young people's attitudes about drug use and on increasing knowledge (Botvin & Kantor, 2000).

Whether high scores on rationality truly play a decisive part in the decision process, or whether other aspects are more influential—and hence would be more appropriate targets for prevention efforts—will need further exploration in future research.

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