

Chapter 7 Social cognitive determinants of ceasing ecstasy use: ceasing is not the opposite of using

Ecstasy use is potentially damaging to health [17; 20; 21] yet prevalent [74; 112], and although accordingly, a need for intervention development has been asserted, it has also been observed that evidence to base these interventions on is scarce [35]. If evidence-based interventions are to be developed, more research into the determinants of ecstasy use is necessary. In particular, all quantitative research into ecstasy use has examined determinants of the behaviour 'using ecstasy' [35], whereas recent qualitative evidence suggests that reasons, and therefore possibly determinants, of related but distinct behaviours such as 'trying out ecstasy' and 'ceasing ecstasy use' may be different. To address this issue, the current paper reports a study that examines the determinants of ceasing ecstasy use.

Interventions promoting abstinence from ecstasy use can do so either by targeting non-users and preventing them from trying out ecstasy, or by targeting users and causing them to cease using ecstasy. Thus, the behaviours of interest for such interventions are trying out ecstasy and ceasing ecstasy use, not using ecstasy. This discrepancy may prove problematic because the theories that guided these studies (i.e. Ajzen's Theory of Planned Behaviour [TPB; 30; e.g. 56; 58-61] and the expectation part of the outcome expectancy constructs from Bandura's Social Cognitive Theory [13; SCT; 34; e.g. 54; 55; 57]) both emphasised the relevance of sufficiently specific measures [30; 34]. For example, in exercise research, evidence has been found that suggests that similar but related behaviours can have different determinant configurations (e.g. a social cognitive determinant that significantly contributes to predicting one behaviour need not contribute to the prediction of related behaviours; [84]). Although in ecstasy use, such studies are lacking, a qualitative review did find different reasons for trying out ecstasy, using ecstasy, and ceasing ecstasy use [114]. If

these concerns prove grounded, then that means that there is no research available to inform interventions aimed at preventing ecstasy use or promoting cessation.

The determinants that will be measured are drawn from the Theory of Planned Behaviour [TPB; 30], which has been shown applicable to ecstasy use [56; 58; 60; 61] and as such provides a good starting point. The TPB postulates intentions as most proximal social cognitive determinant of behaviour, in turn predicted by attitude (i.e. evaluation of the likelihood and desirability of that behaviour's consequences), subjective norm (i.e. perception of others' approval of the behaviour) and perceived behavioural control [PBC, i.e. perception of control based on perception of skills and external obstacles/facilitators; very similar to self efficacy; 30]. In addition to these traditional TPB determinants, four additional determinants have been found predictive of ecstasy use [35]: subjective descriptive norm [an extension of the traditional subjective normative construct that assesses the perceived behaviour of social referents; 142], anticipated regret [or affect; the amount of negative emotions one experiences when prospectively imagining not having performed the target behaviour; 143; 144], moral norm [ones personal norm regarding performing a behaviour; 58; 145], and habit. Of these, however, habit will not be included, as cease ecstasy use cannot sensibly be habitual. The outcome expectancy approach [based on Social Cognitive Theory, 34] has also proved informative in explaining ecstasy use [13; 54; 55; 86], and it has been suggested that these two approaches be combined in future research [35]. Therefore, in the current study, a number of expectancies specified in previous Dutch studies [13; 86] were also measured, along with two additions that were based on a Dutch qualitative study [147].

In sum, the current study was designed to address a number of lacunae in ecstasy use research. First, the determinant configuration of cease ecstasy use will be mapped, allowing comparison to the determinant configuration of using ecstasy [see 35]. Second, the overlap of the TPB and the outcome expectancy approach will be addressed. Third, the relative relevance of the traditional TPB determinants and three of the four additional TPB determinants that were found predictive of ecstasy use will be determined.

Methods

Procedure

An online questionnaire study was conducted as the internet has been argued to be a suitable medium for studying hidden populations such as non-misusing illicit drug users [149]. Participants were recruited by links at several dance-related Dutch websites (most participants came from the online community at <http://partyflock.nl>). The questionnaire was administered by a self-chosen virtual interviewer in a Flash interface [150; also see 151]. To activate the proper context for respondents, the interview took place to the background of several party pictures while dance music was playing. Server-side parsing of the content (using PHP and MySQL; see [152]) enabled tailoring of the questionnaire to the respondent (i.e. presentation of every item depended upon previous answers).

This possibility to tailor the questionnaire enabled data collection for several behaviours simultaneously, but only results pertaining to ceasing ecstasy use will be reported here, and therefore only methodological details relevant to these results. At the first measurement (t_1), demographics, drug use, party behaviour, ecstasy expectations, and behavioural intentions to use ecstasy were measured for all participants, after which a subsample of participants answered questions about the intention to cease ecstasy use and the underlying determinants (the other participants answered questions about the determinants of other behaviours). After three months, participants could access the follow-up measurement (t_2), where their ecstasy use behaviour in the past three months was measured, after which a different subsample of participants answered the same questions about the intention to cease ecstasy use and the underlying determinants. In this way, two independent samples were recruited. Five months later (t_3 ; logistical problems delayed this follow-up two months), again participants' ecstasy use behaviour was measured. Participants were attended to these follow-ups by e-mail, and six weekly reminders were sent out. Permission to perform this investigation was granted by the Ethical Committee Psychology of Maastricht University (the ECP).

Measurements

At t_1 , *demographic variables* (gender, age and education level), *drug use* ('which of these substances do you occasionally use at parties?') and *party behaviour* were measured with one item each, as well as a number of consistently reported *ecstasy expectations* (the leading statement "if I would take ecstasy I would . . .")

was followed by “feel very good”, “feel more connected to other people”, “make contact easier”, “understand myself better”, “have better sex”, “get a lot of energy”, “live my life more intensely”, “have a better life than without ecstasy”, “damage my health”, “feel bad the next couple of days”, “feel nauseous”, and “get stiff jaws”). *Behavioural intention to use ecstasy* was measured with two items at t_1 (i.e. ‘do you intend to use ecstasy in the next three months?’ and ‘do you think that you will indeed do that?’, both absolutely not–absolutely; range 1–5; $\alpha = .92$), but at t_2 and t_3 , only the first of these two items was used.

In the subsamples at t_1 and t_2 , *behavioural intention to cease ecstasy use* was measured with the same two items used for using ecstasy at t_1 (i.e. ‘do you intend to cease ecstasy use in the next three months?’, $\alpha = .87$ at t_1 and $.84$ at t_2). *Attitude* was measured with five semantic differentials (i.e. ‘I think that ceasing ecstasy use is/would make me ...’, unpleasant–pleasant, bad–good, unwise–wise, not nice–nice, unhappy–happy; range 1–5; $\alpha = .73$ at t_1 and $.75$ at t_2). *Subjective norm* was measured by multiplying an item tapping injunctive subjective norm (e.g., ‘how would your parents feel if you were to cease using ecstasy?’, disapproving–approving; range -2–2, also including an option ‘I don’t know’ with the same value as the middle option ‘neutral’, i.e. 0) with an item tapping motivation to comply (e.g. ‘how important do you find your parents’ opinion about whether you cease using ecstasy?’, very unimportant–very important; range 1–5) for best friend, other friends, and parents, and dividing the product by 5 to get a range of -2–2 ($\alpha = .52$ at t_1 and $.75$ at t_2). *Perceived behavioural control* was measured with two items (i.e. ‘imagine that you would want to cease ecstasy use’, followed by ‘does it seem easy to you to cease ecstasy use?’, ‘do you think you would manage to cease using ecstasy?’, absolutely not–absolutely; range 1–5; $\alpha = .78$ at both t_1 and t_2).

Two *descriptive norm* measures were employed. The first measured whether ones best friend had ceased ecstasy use recently (i.e. ‘did your best friend cease using ecstasy in the past year?’, with answer options ‘no, and he/she did not try either’ (coded 1), ‘no, but he/she doesn’t use anyway’ (2), ‘no, but he/she did try’ (3), and ‘yes’ (4)), and the second measured how many other friends has ceased ecstasy use recently (i.e. ‘how many of your other friends have ceased using ecstasy in the past year?’, with answer options ‘none’ (coded 1), ‘some’ (2), ‘about half’ (3), ‘many’ (4), ‘most’ (5), and ‘most did not use ecstasy in the first place’ (also coded 3)). Because of these incomparable scales, these two items were not aggregated. *Moral norm* was measured by two reverse

items (i.e. 'cease ecstasy use contrasts my principles', 'I would feel troubled if I were to cease using ecstasy' absolutely not-absolutely; range 1-5; $\alpha = .83$ at t_1 and $.79$ at t_2). *Anticipated regret* was measured by three items (i.e. 'imagine that you would want to cease using ecstasy, but that at a party, you end up taking ecstasy anyway. Imagine how you would feel the next day. Would you [regret it/worry/feel guilty]?', not at all-very much; range 1-5; $\alpha = .87$ at both t_1 and t_2).

At t_2 at t_3 , party attendance was measured by asking participants how many parties they had attended. If participants had not attended any parties, they could indicate one or more of seven reasons, one of which was 'because I want to cease ecstasy use and I enjoy parties less when I don't use ecstasy' (other reasons included 'there were no nice parties' and 'I was saving for a different party'). If they had attended one or more parties, ecstasy use in the past three months was measured, and if they had not used, they could indicate one or more of nine reasons, one of which was 'I want to cease ecstasy use' (other reasons included 'I failed to obtain ecstasy' and 'I had to drive back'). Thus, two dichotomous *behavioural measures* were available: whether participants had used ecstasy between two measurements or not (ecstasy use); and whether participants had indicated that they had not used because they wanted to cease ecstasy use (ecstasy cessation). At t_3 , we measured *reasons to cease* use: those participants who had visited one or more parties, had not used ecstasy, and indicated that they wanted to cease, were asked why they wanted to cease. They could choose one or more of 12 reasons and were offered the possibility of entering a different reason as well.

Analyses

As Cohen argued, "the primary product of a research inquiry is one or more measures of effect size" [153, p. 1310]. Especially with large samples, trivial associations can become significant. Therefore, rather than their significance, associations' meaningfulness will guide the discussion of the results.

Associations are considered meaningful when they are non-trivial. We distinguish five levels of association strength (effect size): trivial, weak (Cohen's $d > .2$; Pearson's $r > .1$; Cramer's $V > .1$; odds ratio > 1.5), moderate (Cohen's $d > .5$; Pearson's $r > .3$; Cramer's $V > .3$; odds ratio > 2.5), strong (Cohen's $d > .8$; Pearson's $r > .5$; Cramer's $V > .5$; odds ratio > 4), and very strong (Cohen's $d > 1.3$; Pearson's $r > .7$; Cramer's $V > .7$; odds ratio > 10) [70; 109; see also 154; 155]. For the significance tests of bivariate associations between one dichotomous and one continuous variable, the t-test for unequal variances will be used (in

recognition of the issues pointed out by Ruxton [156]). Differences between correlations were tested by converting the correlations to Fisher's Z using:

$$Z_{Fisher} = \frac{1}{2} \log_e \frac{1+r}{1-r}$$

Then, the effect size q for the difference between two correlations was calculated using [70]:

$$q = Z_{Fisher_1} - Z_{Fisher_2}$$

Finally, a p value for this difference was attained by calculating the surface of the standard normal function for:

$$Z_{FisherDifference} = \frac{q}{\sqrt{\frac{1}{N_1 - 3} + \frac{1}{N_2 - 3}}}$$

The difference between two correlations is considered small when $q \geq .1$; medium when $q \geq .3$; and large when $q \geq .5$ [70]. In addition to bivariate analyses, we will conduct a number of multivariate analyses to enable exploration of associations between variables while artificially keeping other variables constant. In particular, we used linear and logistic regression. In these analyses, Cook's distances were examined (but always remained low), and cases with absolute studentised residuals > 3 were considered outliers and discarded from the analyses (one case was discarded).

Results

At the first measurement (t_1), 3 754 ecstasy users participated. At the second measurement (t_2), 1 807 of these were retained (48%), and at the third measurement (t_3), 1 105 participants (61%). At t_1 , 276 users participated in the TPB determinant subsample (where the determinants of ceasing ecstasy use were measured), of whom 168 were retained at t_2 (61%), and 95 at t_3 (57%). At t_2 , 301 users participated in the TPB determinants subsample, of whom 165 were retained at t_3 (55%). Figure 7.1 illustrates these samples sizes at the three measurement moments and user group transitions.

Drop-out analyses for demographic variables, used drugs, party behaviour and expectancies showed that no variables were significantly and

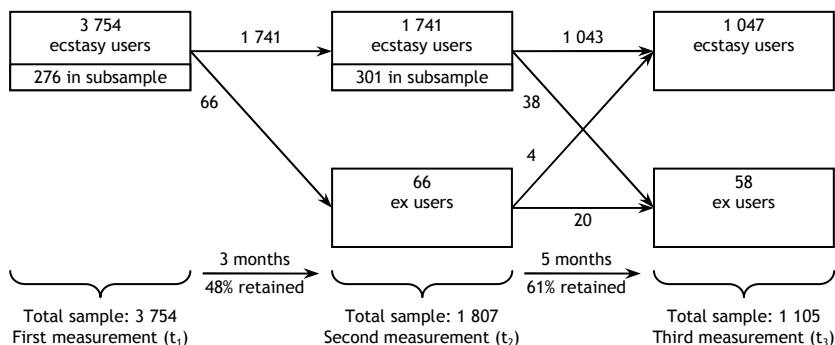


Figure 7.1: Sample sizes and characteristics.

meaningfully associated to whether participants dropped out. However, when looking at the TPB determinants, intention to cease is weakly associated to dropout at t₂ (within the t₁ subsample: 2.17 vs. 1.93, Cohen's $d = -0.28$, $t[274] = 2.18$, $p < .05$) and t₃ (within the t₂ subsample: 2.44 vs. 2.12, Cohen's $d = -0.34$, $t[299] = 2.96$, $p < .01$), and anticipated regret is weakly associated to dropout at t₂ (within the t₁ subsample: 2.19 vs. 2.48, Cohen's $d = 0.26$, $t[274] = -2.10$, $p < .05$). These lower intentions imply that the users that were retained at t₂ may be, on average, more persistent users than those comprising the sample at t₁. If this is the case, the second subsample may not be a random sample of users.

Indeed, differences between the subsamples are apparent in Table 7.1, which shows the characteristics of the participants in, and comparisons between, the two subsamples. Use of cannabis and GHB differ slightly, but more importantly and interestingly, intention is higher, not lower, in the t₂ sample, as are attitude and subjective norm. (perceived behavioural control (PBC) and anticipated regret have trivial effect sizes). Although the effect sizes are only small, they indicate the t₂ subsample may indeed not be a random sample (despite the similarities in demography). In any case, the t₂ subsample is not a more persistent subsample: if anything, it seems more eager to cease using. This difference between the samples will be addressed where appropriate, and possible explanations and implications will be more fully considered in the discussion.

In bivariate analyses, participants' intention at t₁ very strongly predicted whether they would indeed have ceased ecstasy use at t₂ (1.90 vs. 2.90, Cohen's $d = 1.41$, $t[166] = -3.11$, $p < .01$), and intention at t₂ very strongly predicted cessation at t₃ (2.06 vs. 3.13, Cohen's $d = 1.17$, $t[163] = -3.23$, $p < .01$). However,

Table 7.1: Participant characteristics (for means, standard deviations are provided in parentheses) for the subsamples at t_1 and t_2 , and effects sizes and significances for the difference between these two subsamples.

Variable name or categories	Range	% or mean (sd)		Difference	
		Subsample at t_1		Subsample at t_2	
		(n = 276)	(n = 301)	Unit	Value
Gender (being female)		42%	45%	OR	1.14
Higher educated		50%	42%	OR	.73
Alcohol use		84%	84%	OR	1.00
Tobacco use		59%	63%	OR	1.15
Cannabis use		54%	44%	OR	.67*
Speed use		36%	40%	OR	1.17
Cocaine use		36%	41%	OR	1.24
GHB use		24%	14%	OR	.54**
Poppers use		7%	8%	OR	1.16
Nitrous oxide use		8%	7%	OR	.87
Psylocybin use		4%	4%	OR	1.10
Ketamine use		6%	6%	OR	.97
LSD use		3%	1%	OR	.52
Visits a big party twice a year or less		15%	13%	V	.06
- every two to six months		59%	56%		
- every month or more		26%	31%		
Visits a club/small party bimonthly		26%	25%	V	.02
- every two to four weeks		55%	55%		
- every week or more		20%	21%		
Age in years	13–53	25.44 (6.86)	24.52 (6.47)	d	-.14
Expectation to feel very good	1–5	4.47 (.68)	4.39 (.71)	d	-.11
Expectation to feel more connected	1–5	4.22 (.87)	4.18 (.94)	d	-.04
Expectation to make contact easy	1–5	4.16 (.92)	4.05 (1.03)	d	-.12
Expectation to understand self better	1–5	2.81 (1.21)	2.73 (1.18)	d	-.07
Expectation to have better sex	1–5	3.07 (1.26)	3.21 (1.28)	d	.11
Expectation to get a lot of energy	1–5	4.09 (.91)	4.23 (.93)	d	.15
Expectation to live a more intense life	1–5	3.07 (1.29)	2.91 (1.24)	d	-.12
Expectation to have a better life	1–5	2.62 (1.34)	2.54 (1.27)	d	-.06
Expectation to damage health	1–5	3.93 (1.09)	4.04 (.98)	d	.10
Expectation to feel bad for a few days	1–5	3.63 (1.24)	3.44 (1.25)	d	-.15
Expectation to feel nauseous	1–5	1.94 (1.10)	1.94 (1.15)	d	-.00
Expectation to get stiff jaws	1–5	3.46 (1.25)	3.48 (1.24)	d	.01
Intention to cease ecstasy use	1–5	2.03 (.82)	2.26 (.97)	d	.26**
Attitude	1–5	3.26 (.58)	3.44 (.61)	d	.31***
Subjective norm	-2–2	0.51 (.44)	0.64 (.56)	d	.26**
Perceived behavioural control	1–5	4.17 (.91)	3.99 (1.02)	d	-.19*
Descriptive norm regarding best friend	1–4	1.59 (.85)	1.57 (.93)	d	-.01
Descriptive norm regarding friends	1–5	1.67 (.69)	1.70 (.78)	d	.05
Moral norm	1–5	4.31 (1.00)	4.31 (.93)	d	.00
Anticipated regret	1–5	2.36 (1.14)	2.15 (1.04)	d	-.19*

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

Levene's test for equality of variances indicated that the variance in intention at t_2 may not be equal for those who cease at t_3 and those who do not, and although this test was not significant for the first subsample, it may not be reliable given the low number of participants that ceased (5 out of 168 for the first subsample, and 8 out of 165 for the second subsample). Because manual inspection of the standard deviations did imply unequal variances (.69 vs. 1.08 for the first subsample and .87 vs. 1.48 for the second subsample), it may be more appropriate to consult the t-test for unequal variances, which did not achieve significance for either of the two subsamples ($t[4.10] = -2.04$ for the first subsample and $t[7.25] = -2.01$ for the second subsample).

Because the second measure of behaviour (whether participants had used ecstasy at t_2/t_3 or not) had more equal group sizes (at t_2 , 132 out of 168 users had used ecstasy, and at t_3 , 112 of 165), its analysis is more reliable. A both measurements, the association with intention was weaker, but did achieve significance with the t-test for unequal variances (at t_2 , Cohen's $d = -.57$, $t[51.24] = 2.84$, $p < .01$; at t_3 , Cohen's $d = -.68$, $t[90.00] = 3.90$, $p < .001$). These results support the strong predictive role of intention to cease ecstasy use for subsequent ecstasy use. The association between intention to use ecstasy, rather than to cease ecstasy use, and subsequent ecstasy cessation (i.e. the first behavioural measurement) is weaker both at t_2 (Cohen's $d = -.95$) and t_3 (Cohen's $d = -.82$). Intention to cease is thus a better predictor of cessation than intention to use ecstasy. Combined, these analyses make clear that closer inspection of the determinants of intention to cease ecstasy use determinants is warranted.

The correlations between all determinants, and their means and standard deviations, are shown in Table 7.2. In the first subsample, intention is strongly associated to the TPB determinant attitude, moderately to subjective norm, and weakly to descriptive norms regarding friends and moral norm. In the second subsample, intention is strongly associated to attitude, moderately to descriptive norm regarding friends, and weakly to descriptive norm regarding best friend, moral norm, subjective norm, anticipated regret and PBC. To verify these apparent differences between the correlations between these determinants (the determinant configurations) in the two subsamples, the differences between correlations were also calculated. The effect sizes and significance levels from this analysis are shown in Table 7.3. When looking at the TPB determinants, there were significant meaningful differences in the correlations between intention and PBC, intention and both descriptive norm measures,

Table 7. 2: Correlation coefficients for the associations between all determinants in the subsample at t₁ (above the diagonal, n = 276) and at t₂ (below the diagonal, n = 301).

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
1 Helps to feel very good	-	.28***	.31***	.18***	.13*	.27***	.11	.22***	.02	.02	-.11	.09	-.08	-.17**	.06	-.05	-.04	.05	-.10	-.01
2 Helps to feel connected	.30***	-	.52***	.29***	.06	.14*	.20**	.19**	.00	-.04	-.02	.06	-.11	-.18**	-.10	-.03	.05	.06	-.10	.10
3 Helps making contact	.20***	.55***	-	.35***	.11	.18**	.17**	.19**	.00	.02	.00	.17**	-.02	-.09	.06	-.08	.04	.03	-.07	.13*
4 Helps to understand self	.19***	.33***	.30***	-	.11	.16**	.25***	.34***	-.14*	-.05	-.03	.02	-.04	-.14*	.11	-.13*	.05	-.08	-.28***	.11
5 Sex enhancement	.08	.11	.17**	.21***	-	.14*	.13*	.15*	-.01	-.11	-.02	.00	.05	-.04	.09	-.11	-.03	.05	-.04	-.10
6 Provides energy	.21***	.10	.13*	.07	.15**	-	.07	.07	.05	.00	-.12	.03	.02	-.02	.08	.05	.12*	.02	-.08	-.06
7 Helps to live intensely	.25***	.17**	.16**	.32***	.17**	-.01	-	.51***	-.07	-.05	-.10	-.01	-.22***	.31***	.00	-.12*	-.04	.01	-.22***	.07
8 Helps to live a better life	.18**	.11*	.18**	.21***	.19**	.01	.51***	-	-.01	-.09	-.04	.04	-.16**	.30***	.04	-.27***	.02	-.07	-.25***	.06
9 Damages my health	.01	.09	.09	-.01	.08	-.01	-.03	.05	-	.41***	.20**	.22***	.22***	.21***	.17**	-.03	-.04	.04	.06	.11
10 Induces down period	.08	.22***	.16**	.15*	-.04	.04	.07	-.04	.29***	-	.22***	.23***	.07	.15*	.19**	-.10	.09	.06	.07	.10
11 Makes me feel nauseous	-.07	.11	.06	.09	-.08	-.09	.06	-.02	-.06	.19***	-	.30***	.05	.01	.06	-.04	.03	.03	-.03	.20**
12 Makes my jaws feel stiff	.10	.13*	.12*	.11*	.03	.09	.07	.04	.12*	.17**	.27***	-	.04	-.05	.13*	-.06	-.02	-.04	-.01	.08
13 Behavioural intention	-.10	-.09	-.05	.05	-.05	-.06	-.17***	-.08	.12*	.12*	.12*	.03	-	.57***	.30***	-.04	.09	.13*	.15*	.09
14 Attitude	-.24***	-.11	-.01	-.03	-.10	-.06	-.25***	-.18**	.14*	.09	.16**	-.04	.55***	-	.36***	.01	.07	.15*	.34***	.02
15 Subjective norm	-.03	.06	.09	.12*	.05	.03	.02	.11	.15**	.11	.03	.08	.21***	.34***	-	-.07	.11	.09	.11	.05
16 PBC	-.08	-.04	-.09	-.11	-.08	-.01	-.13*	-.29***	.00	-.04	.05	-.06	.11*	.13*	-.08	-	-.05	.07	.04	-.14*
17 Descr. norm (best friend)	-.06	.01	-.01	.07	-.03	-.09	-.02	-.09	-.04	.07	.04	.27***	.21***	.24***	.00	-	.27***	-.04	-.03	-.03
18 Descr. norm (friends)	-.09	-.01	-.04	.00	.08	.00	-.05	-.05	-.04	.00	.02	.02	.32***	.23***	.17**	.01	.34***	-	.09	.08
19 Moral norm	-.11	-.10	-.16**	-.13*	-.08	-.04	-.18**	-.28***	.06	.03	.06	.04	.23***	.38***	.10	.29***	.10	.06	-	.05
20 Anticipated regret	-.04	.04	.06	-.02	.05	.06	.03	.10	.06	.05	-.05	.06	.18**	.16**	.24***	-.19***	.01	.06	.03	-

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

Table 7.3: Difference between correlations in the first subsample (t_1) and the second subsample (t_2), expressed in effect size measure q , and significance level of this difference.

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
1 Helps to feel very good	-																			
2 Helps to feel connected	.02	-																		
3 Helps making contact	-.13	.04	-																	
4 Helps to understand self	.02	.04	-.05	-																
5 Sex enhancement	-.06	.05	.06	.10	-															
6 Provides energy	-.06	-.04	-.05	-.09	.01	-														
7 Helps to live intensely	.14*	-.03	-.01	.09	.04	-.08	-													
8 Helps to live a better life	-.05	-.07	-.02	-.14*	.04	-.06	-.01	-												
9 Damages my health	-.01	.09	.09	.13	.09	-.06	.04	.06	-											
10 Induces down period	.06	.27***	.14*	.20**	.07	.04	.12	.05	-.14*	-										
11 Makes me feel nauseous	.04	.13	.06	.12	-.06	.03	.16*	.02	-.26***	-.03	-									
12 Makes my jaws feel stiff	.01	.07	-.05	.09	.03	.06	.08	.00	-.10	-.06	-.03	-								
13 Behavioural intention	-.02	.02	-.03	.09	-.10	-.08	.06	.09	-.11	.05	.07	-.01	-							
14 Attitude	-.06	.07	.08	.11	-.06	-.04	.06	.13	-.07	-.06	.15*	.01	-.04	-						
15 Subjective norm	-.09	.16*	.03	.01	-.04	-.05	.02	.07	-.01	-.09	-.03	-.06	-.10	-.02	-					
16 PBC	-.03	-.01	-.01	.02	.03	-.06	-.01	-.02	.03	.06	.09	.00	.16*	.13	-.01	-				
17 Descr. norm (best friend)	-.02	-.04	-.05	-.06	.10	-.15*	-.05	-.04	-.05	-.13	.04	.06	.19*	.14*	.13	.05	-			
18 Descr. norm (friends)	-.14*	-.07	-.07	.08	.13	-.02	-.06	.02	-.08	-.06	-.01	.06	.20**	.08	.08	-.06	.09	-		
19 Moral norm	-.01	.00	-.09	.15*	-.04	.04	.04	-.03	.00	-.04	.09	.05	.08	.04	.00	.26***	.14*	-.03	-	
20 Anticipated regret	-.03	-.06	-.07	-.13	.15*	.12	-.05	.04	-.05	-.05	-.25**	-.02	.10	.14*	.19*	-.05	.04	-.02	-.02	-

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

attitude and anticipated regret, subjective norm and descriptive norm regarding friends, subjective norm and anticipated regret, moral norm and PBC, and moral norm and descriptive norm regarding best friend. Although again, these differences are small, they do confirm the dissimilarity of the two samples, which will be considered in the discussion.

Regression weights in regression analyses of intention on the traditional (step 1) and additional (step 2) TPB determinants are shown in Table 7.4. In the first subsample, only attitude achieved significance, with the total model explaining 34% of the variation in intention (a parsimonious model with only attitude explains 32%). In the second subsample, interestingly, also the descriptive normative measures (both regarding best friend and other friends) achieve significance, and here, the total model explains 37% (a parsimonious model with only the significant predictors explains 35%).

To assess the degree of overlap between the expectation approach and the TPB approach, we conducted two analyses. Because the expectations were measured at t_1 , these analyses were conducted for the first subsample only. First, to establish the degree to which the expectations explain variation in TPB's attitude, attitude was regressed upon the expectations. The results are shown in Table 7.5. The expectations together explain only 20% of the variation in TPB's attitude measure. The significantly contributing expectations are the expectation that ecstasy helps to feel very good, to live life more intensely, to

Table 7.4: Regression analyses to predict intention from traditional (step 1) and additional (step 2) TPB determinants in the first (t_1) and second (t_2) subsample.

	First subsample (n = 275)		Second subsample (n = 299)	
	β step 1	β step 2	β step 1	β step 2
Attitude	.53***	.55***	.54***	.47***
Subjective norm	.10	.10	.03	-.03
PBC	-.03	-.02	.04	.06
Descriptive norm (best friend)		.02		.14**
Descriptive norm (other friends)		.02		.18***
Moral norm		-.06		.00
Anticipated regret		.08		.09
R ²	.33	.34	.31	.37
R ² change	.33	.01	.31	.06
F of R ² change	44.98***	1.04	43.44***	7.83***
Df _F (change)	3	4	3	4
Df _F (error)	271	267	295	291

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

Table 7.5: Regression analyses where attitude was predicted from the ecstasy expectations, and regression analyses where the residuals were predicted from the ecstasy expectations (these residuals are the differences between measured intention and intention predicted by a parsimonious model consisting of the significant predictors in step 2 in Table 7.4).

	β s for attitude (N = 276)	β s for residuals (N = 275)
Help to feel very good	-.13*	-.01
Helps feeling more connected	-.11	-.03
Helps to make contact easier	.07	.05
Helps to understand myself better	.02	.09
Sex enhancement	.03	.06
Provides energy	.02	.01
Helps to live life more intensely	-.20**	-.06
Helps to live a better life	-.17*	.00
Damages my health	.19**	.15*
Makes me feel bad for days after use	.08	-.08
Makes me feel nauseous	-.06	.05
Makes my jaws feel stiff	-.08	.03
R ²	.20	.04
F of R ²	5.41***	.91
D _{fr} (model)	12	12
D _{fr} (error)	263	262

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

live a better life, and that ecstasy damages ones health. Second, we examined whether these expectations have additional predictive value over the TPB. We did this by saving, for every participant, their predicted intention to use ecstasy as predicted by the parsimonious model described above. The difference between each participants' measured intention and their predicted intention (the residual) represents the part of intention that cannot be explained by the TPB determinants. We then regressed this residual upon the expectations. This shows what percentage of intention, of the part that cannot be explained by the TPB determinants, can be explained by the expectations, providing a measure of their additional value. The advantage of this approach compared to conducting a hierarchical regression analysis is that in this way, only the variation in intention that is not already accounted for by the TPB determinants is considered, whereas in a hierarchical regression analysis, it is possible that expectations' regression coefficients achieve significance by explaining variation that was previously explained by for example attitude. As can be seen in Table 7.5, the model fails to achieve significance, explaining only 4% of the unexplained part of intention. Because 65% of the intention to cease using ecstasy remains unexplained (see Table 7.4), this means that the expectations

together explain an additional 3% of intention. This 3% is mainly due to the expectation that ecstasy damages one's health, the only significant predictor in the model.

At t_3 , we asked participants who indicated that they had not used ecstasy because they wanted to cease, why they had not used ecstasy. The results are shown in Table 7.6. The most frequently endorsed reason was transition to another life phase (endorsed by 42% of the participants), followed by health reasons (37%), tolerance (29%), experiencing negative effects (24%), decreasing ecstasy quality (13%), no longer attending dance events/parties (11%), and influence of ecstasy on professional or private life (10%). Of the 'different reasons' that participants supplied, some don't reflect a clear reason (e.g. "just don't feel like drugs any more"), some seem to fall in the predefined categories (e.g. "I don't like them and the quality has degraded"), and some indicate additional reasons that were not in the list: the unpleasant side effects of ecstasy and preferring different drugs over ecstasy.

Table 7.6: Reasons for ceasing ecstasy use provided by ex-users at t_3 (N = 38).

Reason	Responses Cases		
	N	%	%
The quality of ecstasy decreased	5	6%	13%
I enjoy ecstasy less, or notice less of its effects	11	13%	29%
I no longer attend the locations where I used to use ecstasy (parties/clubs)	4	5%	11%
I notice that I feel more down or depressed in daily life	9	11%	24%
Because of my mental or physical health	14	17%	37%
My ecstasy use started to influence my work/study/private life	4	5%	11%
My friends stopped using ecstasy	1	1%	3%
My friends make negative critical remarks about my use	1	1%	3%
I got into a relationship or married	8	10%	21%
I got a (different) job	1	1%	3%
I got a child (or several)	1	1%	3%
I have gone to another life phase	16	20%	42%
Different reasons:	7	9%	18%
Just don't feel like drugs any more			
I don't feel a need			
I think ecstasy is a boring drug			
I don't like them and the quality has degraded			
Unpleasant side effects			
I prefer speed			
Ecstasy started using me			
Total	82	100%	216%

Discussion

First, the results will be briefly summarised. Users' intention to cease using ecstasy was highly predictive of subsequent self-reported cessation. When looking at the determinants underlying intention in the first subsample, bivariate analyses show that attitude is strongly related to intention, moderately to subjective norm, and weakly to descriptive norms regarding friends and moral norm. Within the second subsample, attitude is strongly related to intention, and weakly to all normative variables, PBC and anticipated regret. Analyses of the differences between the correlations with intention in the two subsamples show significant meaningful differences for PBC and both descriptive norm measures. Multivariately, in the first subsample, only attitude achieves significance when predicting intention to cease ecstasy use ($R^2 = .34$), whereas in the more persistent subsample, also both descriptive norm variables achieve significance ($R^2 = .37$). Subsequent analyses showed that although the expectations explained 20% of TPB's attitude, together, they could not explain variation in intention that was not already explained by the TPB.

The second subsample had a higher intention to cease, and higher attitude and subjective norm, than the first subsample; perceived behavioural control (PBC) and both descriptive norm measures were associated to intention more strongly; and in multivariate analyses, both descriptive norm measures achieved significance in the second, but not the first, subsample. Although the bivariate differences were small, these differences indicate that the second subsample may not be a random sample. Interestingly, although intention was also related to drop-out at t_2 in the first subsample, participants who were retained had a *lower* mean intention at t_2 . Since it is unlikely that all participants' intention to cease decreased over time (the opposite would have been conceivable [83], but a massive decrease in intention to cease is implausible), this means that more users with a high intention dropped out (possibly because users who became ex-users lost interest in the questionnaire). But then, how is it possible that intention in the second subsample is higher?

A simple explanation in line with the evidence is the following. As was recently observed by Marsden and colleagues [83], filling out a questionnaire on their ecstasy use can cause participants to cease their ecstasy use, so we can assume that also in the present sample, the measurement at t_1 increased participants intention to cease using. This increased intention explains the higher intention in the second subsample (t_2) compared to the first subsample (t_1). Now, if we further assume that more participants, who ceased using

ecstasy at t_2 , dropped out than participants who did not cease using ecstasy, we also explain why the intention to cease is lower among the retained users from the first subsample. Because users' intention to cease increased between t_1 and t_2 , and the users with the highest intention managed to cease, relatively many of these dropped out. Because these users also had the highest intention to cease at t_1 , the average intention to cease was lower among those in the first subsample that were retained at t_2 (note that in this first subsample, the intention was measured at t_1).

Such a scenario would have two consequences. First, reported associations between intention and behaviour are underestimates of these associations' strength in the population. Second, the second subsample represents ecstasy users after their intention has been increased (indeed, less persistent ecstasy users). This means that the determinant configuration in the second sample indicates the determinants that should be targeted by an intervention that is administered after a prior intervention that successfully increases intention. Of course, this explanation would have to be verified by future research, in particular by studies with longitudinal designs [such as the NeXT study, e.g. 138]. In any case, these differences do mean that except in specific cases, the determinant configuration that should inform intervention development is the one mapped in the first subsample.

The current study suffers three limitations. First, the behavioural measure relies on self-reports. Even though these have been shown to be reliable [112; 157], of course, it would have been desirable to eliminate all possibility of measurement error. Second, no belief-based measures were used. Although earlier studies have found direct measures to yield no different results from belief-based measures [58], it would have been interesting to see whether these results would replicate. Third, a number of relevant beliefs and determinants have not been measured. This is partly because results from a recent qualitative review were not yet available. Future research should include more beliefs drawn from qualitative research so as to gain a better understanding of non-users' intention to try out ecstasy. Fourth, the current sample was recruited purely by letting participants voluntarily participate. It cannot be excluded that certain groups of participants, for example non-users that are strongly inclined to remain non-users and have no interest in ecstasy at all, have not participated. The NeXT study [see for example 110] is an excellent example of a study utilising a design that does not suffer such flaws.

Despite these limitations, this study does provide interesting results. First, this is the first study to address the behaviour ceasing ecstasy use. And perhaps related to this, it became clear that only one-third of ecstasy users' intention to cease ecstasy use is understood. Although this is promising for the first study examining this behaviour (reviews found mean R^2 s of .39 [46] and .41 [33]) it is also clear that interventions aiming to promote ecstasy cessation have an urgent need for more research to inform them. As long as it is not clear which determinants are relevant and which beliefs underlie these determinants, developing evidence-based interventions remains problematic. Qualitative studies have suggested that perhaps ecstasy users cease of their own accord in response to changing life circumstances, or when they move to 'the next phase' [114; 147], and this is supported by the low proportion of explained variation in intention and by the fact that the reason for cessation, that was most endorsed, was "I have gone to another life phase". This issue definitely requires more research, before health promoters can rely on such 'automatic cessation', but if confirmed, this would radically change the kind of interventions that are called for (i.e. more harm reduction interventions, and less interventions targeting cessation).

Second, the observation that filling out a questionnaire can prompt users to cease their ecstasy use [83] seems to be corroborated. Furthermore, it seems that once users' intention to cease has been increased, descriptive norm and anticipated regret become more important determinants. However, without further research no clear conclusions can be drawn regarding this issue. Third, the current data do support the theoretical assumption that TPB's attitude encompasses the expectations from Social Cognitive Theory. These results also make clear that for ceasing ecstasy use, this attitude measure encompasses many expectations that are as yet unknown, as only one fifth of the variation in attitude is understood. Since it is these specific cognitive measures that can guide intervention development, it seems advisable to direct research attention to mapping these expectations. Such studies should, however, combine these measurements with other traditional and additional TPB determinants. This makes it possible to examine the relative relevance of these determinants, and whether indeed all expectations underlie attitude (and not other, as yet unidentified, determinants).

And finally, this study provides evidence for the importance of TPB's condition of compatibility [see 30]: the association strength between intention and behaviour was strongest when both measures were equally specific (i.e.

when they both concerned ceasing ecstasy use), and became lower when intention to cease was associated with ecstasy use (rather than cessation), or when intention to use was associated with ecstasy cessation. This makes clear that studies that aim to inform ecstasy cessation interventions should measure intention and determinants of ceasing ecstasy use rather than of using ecstasy. Indeed, when comparing the bivariate associations between determinants and the intention to cease ecstasy use (in the random subsample at t_1) to the associations found in a meta-analysis of the determinants of using ecstasy [35], it seems that indeed the determinant configuration of ceasing ecstasy use differs from that of using ecstasy.

Attitude is strongly associated to intention both for using and for ceasing, but subjective norm, descriptive norm and PBC are strongly associated to intention to use, whereas subjective norm is moderately associated to intention to cease, PBC not at all, descriptive norm regarding friends weakly and regarding best friend not at all. Moral norm is moderately associated to intention to use ecstasy, but weakly associated to intention to cease ecstasy use, and anticipated regret is weakly associated to intention to use, but not to intention to cease. Because the results from the meta-analysis represent an amalgamation of results from studies that use different measurement methods for the TPB determinants in different populations, and the current study used slightly different measurements again, it cannot be excluded that these measurement differences caused the different association strengths until a study compares samples where the same measurement was used. However, as these apparent differences are in line with the qualitative evidence [114; 147], and are predicted by the TPB [the condition of compatibility; see 30], it seems reasonable to assume that they do reflect real differences. Thus, whereas the strongest predictors of intention to use ecstasy are attitude, subjective norm, descriptive norm, and perceived behavioural control (all strongly associated to intention), the strongest predictors of intention to cease ecstasy are attitude (strongly associated), subjective norm (moderately associated), descriptive norm regarding friends, and moral norm (both weakly associated). This means that interventions aiming to promote ecstasy cessation would do well to target these determinants, rather than descriptive norms regarding best friend and PBC, which are not associated to intention to cease ecstasy use.