

“Partying” Hard: Party Style, Motives for and Effects of MDMA Use at Rave Parties

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This study examines motives for and consequences of MDMA use at different types of dance parties in the Netherlands (2001 and 2002). Participants were 490 visitors of three different types of rave parties, “club/mellow,” “trance/mainstream,” and “hardcore” (34% female, mean age 22.3 years, 76.5% MDMA users). Partygoers are motivated primarily by the energetic and euphoric effects they expect from MDMA. Quantity of MDMA use is associated with hardcore and trance/mainstream party style, with the motives of euphoria, sexiness, self-insight, and sociability/flirtatiousness (negative), and with gender, educational level (negative), and MDMA use by friends. Women report more (acute) negative effects—depression, confusion, loss of control, suspiciousness, edginess, nausea, dizziness—than men; and in particular, women who are motivated to cope with their problems by using MDMA are at risk. Men’s polydrug use and notably their motivation to conform to friends by using MDMA are associated with negative effects.

Keywords MDMA; youth culture; drug use; house party; party setting; rave; ravers

Introduction

In the mid-1980s a new form of dance music was synthesized in gay clubs in Detroit, Chicago, and New York: “house,” a hybrid of American disco music and arty European electronic pop music (Mutsaers, 1998; Reynolds, 1998). In the decade to come this kind of ultra-rhythmic electronic music that lacked the traditional verse-chorus structure of pop music and its central role for the human voice proved to be an ideal ‘soundscape’ for mass-scale dance parties, also called ‘house parties’ or ‘raves.’ House started as an underground phenomenon in the U.S., but during the late ’80s it reached mass popularity in the U.K. as a leisure style with two essential elements: music and drugs, i.e., infectious house rhythms to dance to and particularly ecstasy (MDMA) to ‘beautify’ the music and to be able to dance, talk, and flirt all night long (Reynolds, 1998). British young people exported this new type of youth culture to mainland Europe and during the ’90s the extravagant mass scale rave parties were among the most spectacular youth cultural manifestations of the decade. For instance, in its heyday the annual Berlin Love Parade, an outdoor dance festival in the heart of the city, attracted over 1 million visitors (Reynolds, 1998; Rietveld, 1998). Dutch youth were among the first in Europe to welcome house music and the associated leisure style, and by the mid-’90s a local variety of house music—“gabber”—was rated the single most popular music of the moment (Mutsaers, 1998; Ter Bogt et al., 2002; Ter Bogt, 2000). At

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the turn of the century Dutch DJs—Tiësto, Ferry Corsten, and Armin van Buuren—ranked among the most popular in their field and they are known worldwide for their popularization of another subgenre of house music: “trance” (Ter Bogt et al., 2002; Ter Bogt, 2000).

A preference for house music is linked to drug use (Forsyth, Barnard, and McKeganey, 1997); internationally, MDMA use is endemic at dance parties and festivals (Forsyth, 1996; Measham, Aldridge, and Parker, 2001; Van de Wijngaart et al., 1997). However, quantitative data on the motives ravers endorse to take MDMA are scarce and differences in MDMA use at specialized parties have not been studied systematically. The aim of this study is to describe patterns of MDMA use at different kinds of parties, to identify a set of motives for using the drug, and to test if party style and the endorsement of certain motives are associated with perceived positive and negative effects of the drug.

House Music and MDMA

During the '90s DJs and producers of dance music proliferated an array of styles. Audiences could choose from diverse styles such as “mellow,” “deep house,” “garage,” “ambient,” “drum and bass,” “2 step,” “techno,” “hardcore,” “trance,” and “eurohouse” (Mutsaers, 1998; Reynolds, 1998; Rietveld, 1998; Ter Bogt, 2000). Reynolds (1998) defines a structure of three types of dance music underlying this multitude of genres. “*Club*” (e.g. mellow, club, deep house, garage) is a sophisticated, adult-oriented, and relatively melodic sounding type of house music. Reynolds' second category is the much harsher and energetic form of dance music: “*hardcore*” (e.g., hardcore, hardhouse, techno). This form caters to an adolescent crowd with predominantly a lower education. The third type of music and overall category is “*ambient*,” atmospheric electronic music without the insistent beat that defines both club and hardcore. At parties ambient is played in the space where people relax and chat,—the ‘chill out’—a separate area away from the dance floor with relatively tranquil music.

For the Netherlands the distinction between club, also called “club/mellow,” and hardcore was confirmed by several other studies (Mutsaers, 1998; Ter Bogt et al., 2002; Van de Wijngaart et al., 1997; Verhagen et al., 2000). Club/mellow, the first type of house music that was introduced in the Netherlands in the late '80s, is generally played in exclusive venues for an older, ‘arty’ crowd; hardcore at parties with a younger and lower educated audience. In the Netherlands ambient was played in the chill out area as well. In the mid-'90s hardcore music of Dutch origin, “gabber,” became very popular. In 1997, 24% of the 14–19 year olds indicated that gabber/hardcore was their favorite pop music (Mutsaers, 1998; Verhagen et al., 2000; Sikkema, 1997). In the late-'90s a fourth category appeared, next to club/mellow, hardcore, and ambient: “trance.” This sub-genre, which is hard to qualify as either club or hardcore, developed into a melodic sounding type of dance music with pop appeal. At the turn of the century trance was the first and foremost category of dance music. With trance, dance music reached the pop charts and it became the best selling dance genre ever (Ter Bogt et al., 2002).

Internationally, the dance scene is associated with drugs, especially MDMA (Ter Bogt et al., 2002; Measham, Aldridge, and Parker, 2001; Van de Wijngaart et al., 1997). The same holds for the Netherlands. This country is an important producer and distributor of MDMA, and while MDMA is legally categorized as a hard drug, and thus production and selling is prohibited, it is relatively easily available throughout the country (Ter Bogt et al., 2002; Ter Bogt, 2000). However, though party people may find their way to dealers of MDMA, only a small part of Dutch adolescents have ever tried MDMA. In 1995 Korf, Nabben, and Schreuders (1995) found a last-month prevalence of 3% for undergraduate students, and 2 years later De Zwart, Stam, and Kuipers (1997) reported a percentage of 2.2

for adolescent users. The National Drug Monitor (2004) lists that during the years 1992–1999 the lifetime prevalence for students aged 12–19 ranged between 1.0% and 2.2%; the 2001 last-month prevalence for the age group from 16–19 years was 1.5%, and for the group aged 20–24 years, 2.5% (NDM, 2004).

For the party circuit these numbers are considerably higher. Researching a sample of Amsterdam discotheques Korf, Nabben, and Schreuders (1995) reported that 33% of the visitors had used MDMA during the last month. Van de Wijngaart et al. (1995) found that 64% of a total of 758 visitors of rave parties in different parts of the country had taken MDMA that same night. These results suggest that MDMA use is tied up with party culture and metropolitan nightlife; however, the Netherlands is a small country that is heavily urbanized and even rural areas lie in the vicinity of cities, so MDMA use is not confined to the large urban centers (Ter Bogt et al., 2002; Ter Bogt, 2000). Van de Wijngaart et al. (1997) also report that male MDMA users consumed approximately two MDMA pills per night, females one and a half. Hardcore party visitors used more than visitors of mellow parties. Thus, these findings show that the use of MDMA is part of a dance culture that is popular throughout the Netherlands and that gender and party culture are associated with different kinds of MDMA use.

Experiencing MDMA, MDMA'S Effects

Beck and Rosenbaum (1994) recall Zinberg's (1984) theorem of the experience of drugs as being dependent not only on the pharmacological qualities of drugs, but also on 'set' and 'setting.' Set refers to the attitudes of the user with regard to the drug, and more generally, to his/her frame of mind at the time of use. *Setting* refers to the physical and social environment in which the use of drugs takes place. Different kinds of experiences of MDMA use are reported for different kinds of sets and settings: for instance, people taking the drug as clients in a therapeutic context report an 'increase in self-insight' and 'unblocking of traumas' (Beck and Rosenbaum, 1994). MDMA is seen as the prototype of a unique class of drugs—the entactogens or empathogens—which imbue the user with a sense of interpersonal closeness, acceptance of self and other, and feelings of 'oneness' (Bravo, 2001). For partygoers three main types of MDMA experiences can be distinguished: MDMA is a mood enhancing, stimulating, and entactogenous drug.

- First, users at parties experience MDMA as an instant positive enhancer of their mood, they praise MDMA's euphoric effects.
- Second, MDMA is perceived as an energizer: and is experienced as an "upper" to dance and talk all night long without any effort.
- Third, the drug has entactogenous qualities, i.e., MDMA seems to embellish everything. The people, the music, lights, and surroundings, the sheer feel of things seems to be more pleasant and beautiful. It is perceived as a drug that makes one talkative, open, and cuddly. (Measham, Aldridge, and Parker, 2001; Van de Wijngaart et al., 1997; Beck and Rosenbaum, 1994; Zinberg, 1984; Bravo, 2001; Cohen, 1995; Davison and Parrott, 1997; Williamson et al., 1997).

Apart from its perceived positive effects, MDMA use may have long-term negative physical and psychological effects. MDMA use can lead to long-term disorder of the serotonin balance in the brain and damage to the neural system, especially in women (e.g., Curran and Travill, 1997; Gijsman et al., 1999; Hegadoren, Baker, and Bourin, 1999; Reneman et al., 2001; Parrott, 2000) and to possible impairment of cognitive functions,

especially memory (e.g., Parrott, 2000; Reneman et al., 2000; Wareing, Fisk, and Murphy, 2000). MDMA use may have long-lasting negative psychological effects such as sleep disorder, depression, increased anxiety level, impulsiveness, and hostility (Williamson et al., 1997; Curran, 2000; Morgan, 2000; Parrott, Sisk, and Turner, 2000). Users report acute unpleasant effects: nausea, trismus (stiff jaw), bruxism (teeth grinding), hypertension (high blood pressure), tachycardia (heart palpitations), headache, hyperreflexion (excessive muscle spasms), having difficulty walking, perspiration, and loss of appetite (e.g., Konijn, Pennings, and Wolff, 1997).

Motives for Using MDMA

As far as we know, there are no systematic quantitative studies on young people's motives to use MDMA in the setting of rave parties. Van de Wijngaart et al. (1997) suggests that first-time users generally take MDMA out of 'curiosity,' they 'want to try out' the drug. For those who keep on using MDMA after experimenting with the drug, motives change. Regular users mention motives as 'the pleasant feeling XTC evokes,' 'being able to dance all night,' 'get into the music,' 'easier contact with others,' 'euphoria,' 'self-insight,' and 'forgetting problems.'

Trying to define a relevant set of motives, we started with concepts developed in research on (adolescent) alcohol use. Recent studies have shown that young people's drinking behavior is affected by the motivations they endorse for drinking. Cox and Klinger (1988) proposed a framework in which motives are defined by two dimensions, reflecting valence (positive or negative) and source (internal and external) (Cooper, 1994; Engels, Van Gorp, and Lemmers, 2001). This framework embodies four types of motives: drinking to get into a positive mood, drinking to obtain social rewards, drinking to deal with negative emotions, and drinking to avoid social rejection. In other words, past research characterized motives as: enhancement (EnhM), need for sociability (SocM), coping (CopM), and conformism (ConfM).

Research by Cooper (1994), Engels, Van Gorp, and Lemmers (2001), and Cooper et al. (1995) found evidence for the validity of this categorization of four motives, and for their different relation with drinking behavior. For instance, Cooper (1994) showed that social and enhancement motives were related to "heavy drinking," to drinking in situations in which "heavy drinking" was tolerated, and to drinking at parties. In contrast, coping motives were related to solitary alcohol consumption, and not to drinking in public places. These findings indicate that different motives are associated with different drinking habits.

We depart from the theoretical assumption that motives people endorse for drinking alcohol do not differ essentially from motives for taking MDMA. Nevertheless, MDMA may have some specific characteristics that may lead to additional motives to use it. Combining Cox and Klinger's (1988) framework with the above-mentioned results of research on motives for MDMA use and experiences users report, we propose the following scheme.

Motives for MDMA use are arguably associated with the perceived positive effects of the drug. Youngsters may be motivated by the enhancement and social experiences they expect from taking MDMA. Furthermore, they may think that MDMA use is a way to cope with their problems, at least temporarily. They may also conform to peer pressure to take drugs. We tried to refine the Cox and Klinger (1988) set-up for MDMA use. We hypothesize ravers are likely to operate on several enhancement motives: *euphoria* and *energy* (EnhM). A party is not a therapeutic set-up; however, even hard partying gabbers hailed ecstasy

as a drug that increases awareness of the functioning of the self (Van de Wijngaart et al., 1997). The desire to get to know oneself better may be part of the motivational structure to drug consumption: self-insight (EnhM). Ravers may want to use the drug for social reasons, sociability/flirtatiousness and sexiness (SocM) or to forget their problems; i.e., coping (CopM). Relying on research on adolescent alcohol use, we think it is sensible to add the fourth Cox and Klinger (1988) motive. Young people may use MDMA because their friends do. The last motive we discern covers the pressure or wish to join in with friends, conformism (ConfM).

Some motives may be more important to MDMA users than others. This study tries to identify a hierarchy within the set of motives. Recalling Zinberg's (1984) theorem that set and setting influence the experience of drugs, we propose that motives can be seen as part of the mindset of users and that different parties form a different setting. As motives have not been studied systematically, it is unclear whether the endorsement of certain motives is associated with different patterns of use or effects of MDMA, nor is it clear whether the setting, i.e., different parties, are linked to various patterns and perceived effects.

In sum, motives for MDMA use have not been studied systematically and past research has not identified a hierarchy of motives. Cox and Klinger's frame for studying motives for drinking alcohol may be relevant for the identification of this kind of hierarchy. Furthermore, while type of party setting and motives for MDMA use may influence patterns of MDMA/drug use and its perceived effects, research does not report differences in the endorsement of certain motives and perceived positive and negative effects at different parties.

The Present Study

Recent reports on MDMA use at different kinds of parties in the Netherlands are not available and it is not known which pattern of MDMA use is prevalent within the trance party audience. Neither is it clear whether the difference in MDMA use between hardcore and club/mellow fans still exists. Visitors of three kinds of parties, 'hardcore,' 'club/mellow,' and "trance/mainstream" are examined. The first objective of this study is to describe patterns of MDMA use in different settings, i.e., different parties. As gender is an important predictor of MDMA use, both results for men and women are reported.

The second objective of this study is to identify a set of motives for MDMA use endorsed by party visitors. Having identified these motives, the third objective is to test if party culture setting and specific motives are related to patterns of MDMA use. The fourth objective is to test if party culture, motives, and patterns of MDMA use are associated with positive and negative effects of MDMA use.

Method

Procedure and Sample

During 2001 and 2002 the research team visited four different parties.

Party I, 'club/mellow,' took place in a college town of 150,000 in the east of the Netherlands. It was organized by a nonprofessional team of designers and artists. They rented a relatively small venue that held about 900 people the night of the party. The event featured video installations by local artists and a cellar and hall with different kinds of music. The main attraction was Buscemi, a Belgian DJ. Integrating all sorts of South American and

Table 1
Sample characteristics

	I: Club	II: Trance	III: Hardcore 1	IV: Hardcore 2	Total
Type music	Club/ mellow	Trance/ mainstream	Hardcore	Hardcore/techno	
% MDMA users (Life time prev.)	62	58	88	81	77
% Female	46	38	34	28	34
Age	28.3	19.1	21.3	22.5	22.3
Education (1–5)	4.65	3.26	3.36	3.36	3.55
N	66	92	161	171	490

Caribbean samples and records with straightforward dance music, Buscemi gave his set a definite Latin feel, thereby supporting the 'alternative' character of the party. The organizers themselves rate their party as nonmainstream or club. The sample consisted of 66 subjects: 46% female; 62% MDMA users (Lifetime Prevalence). Mean age 28.3 years, varying from 20–43, SD = 5.05; mean level of education (1 = low, primary education only; 5 = high, college) = 4.68, SD = 0.64 (Table 1).

Party II, 'trance/mainstream,' was staged in the halls of the Utrecht Jaarbeurs (Fair Trade & Exhibition Center), hosting 30,000 ravers for one of the biggest trance parties of the year 2001. This rave was part of a series of large-scale dance events featuring VJs operating superb laser and light shows and international top DJs in the field of popular house music. That night, the exhibition center next to the colossal dance hall offered fairground attractions, cocktail bars, and shops with house paraphernalia. After guest DJs from Belgium, Italy, and Britain, DJ Jean—a popular DJ, producer, and house Cd compiler—topped 7 hours of dancing. The organizers themselves rated it as a trance/mainstream event. The sample consisted of 92 subjects: 38% female, 58% users. Mean age 19.1 years, varying from 16–28, SD = 2.62; mean level of education 3.26, SD = 0.96 (Table 1).

Party III, 'hardcore 1,' took place in Amsterdam at the Heineken Music Hall holding about 6000 people for the night. The main hall was decorated with camouflage gear. The lineup of DJs included Dutch and foreign turntablists. That night the music played was predominantly hardhouse; a harsher type of dance music and an offspring of 'gabber,' as recalled, a typical Dutch type of dance music that was massively popular in the mid-'90s. The sample consisted of 161 subjects: 34% female, 88% users. Mean age 21.3 years, varying from 14–41, SD = 3.78; mean level of education 3.36, SD = 1.03 (Table 1).

Party IV, 'hardcore 2,' was held at a theme park in the heart of the countryside with 30,000 visitors. This festival has evolved into a tradition. It started in 1990 as a small-scale event for the fans of gabber, later it grew into an enormous gathering of different kinds of dance audiences. In 2001 various kinds of rave music were played in 12 huge tents scattered over the large festival area. Even after the demise of gabber as a popular dance style, this festival still predominantly caters to the fans of the harder types of rave music. The sample consisted of 171 subjects: 28% female, 81% users. Mean age 22.5 years, varying from 16–37, SD 4.92; mean level of education 3.36, SD = 1.11. The total hardcore group was composed of 332 participants (Table 1).

The total sample consisted of 490 respondents, 34% female, 66% male. The age range was 14–43 years with a mean of 22.3 years, SD = 5.03. Mean level of education (1 = low,

5 = high) was 3.55. A total of 372 respondents (76%) reported they used MDMA. This group of MDMA users could be divided into a group that reported they had taken MDMA that night (60%) and a group not (yet) high on the drug (40%) (Table 1).

At all four parties a relatively quiet spot was secured away from the dance floors. The respondents could sit down or stand at tables with enough light to enable them to read and write. Interviews took place during the first 3 hours of the parties. We restricted our research to these first hours, because we observed that during the night the condition of the audience changed. At later hours, a larger proportion of the visitors did not seem to be capable of being assessed any more.

At all four parties the research team, consisting of the two authors and two or three female social science students, randomly asked passers-by to step up to the tables and complete the questionnaires. The people doing so attracted others who were curious about what happened at the stand; these were then asked to complete forms themselves. Nearly every person approached was willing to fill in the questionnaire, which took 8 to 15 minutes. No rewards were given for taking part in the interview. Most of the participants, including those who were noticeably 'high' on MDMA and/or other drugs were able to rate themselves on the scales without problems. Approximately one in 10 users was so high on MDMA and/or other drugs and alcohol that he or she could not sufficiently concentrate to fill in the form. Data from these participants were removed from further analyses.

We realize that having participants fill in questionnaires in a party atmosphere could result in data that are not reliable. With its lightshows and volume of sound the party is a distracting environment and participants may have used alcohol and one or more drugs. Both the research context and the condition of respondents do not seem to guarantee the necessary concentration for completing questionnaires. However, an indication of the reliability of our results is found in the comparison of Cronbach's α 's of scales responded to by participants who reported that they had taken MDMA prior to with those of scales retrieved from MDMA users not (yet) high on MDMA (see Measures). No systematic differences between reliabilities in these two groups were found. We interpret this as evidence for the fact that people high on MDMA can reliably be assessed.

Measures

Substance Use. Several questions were employed to assess respondent's use of MDMA [see Van de Wijngaart et al. (1997)]. Respondents were asked if they had ever used MDMA with answers, 1 'no' and 2 'yes.' Respondents who answered affirmatively were asked whether they had taken MDMA that night (items of measurement: 1 'no,' 2 'yes'), about the duration of use (1 'less than 6 months' to 4 'two years or longer'), the number of pills per occasion (1 'less than one pill' to 4 'more than 4 pills'), and the frequency of use (1 'not used in the past month' to 5 'once a week or more'). In order to obtain a measure of polydrug use respondents filled in items about their use of alcohol, cannabis, psilocibin ('mushrooms'), amphetamine ('speed'), cocaine, and heroin during the last month (1 'not used last month' to 5 'daily use'). Polydrug use was categorized as 1 'MDMA only' (no polydrug use), 2 'MDMA + cannabis and/or psilocibin' ('soft drug use'), and 3 'MDMA + cocaine and/or speed' ('hard drug' use, 'soft drug' use possible). None of the respondents had taken heroin. MDMA use by friends had five categories ranging from 1 'none of them uses' to 5 'all of them use.'

Motives. Motives were measured with 28 items concerning enhancement, sociability, coping, and conformism, inspired by the reports Van de Wijngaart et al. (1997) gave of motives

of ravers. We grouped these items and added new ones, tapping other motivational aspects in accordance with the types of motives Cox and Klinger discern for alcohol use. All items had the form of “*I take XTC because/to/for*”... and had the format of 5-point Likert scales (1 ‘definitely not,’ 5 ‘definitely so’). From these 28 items seven scales were derived, covering the structural pattern of motives we anticipated. Scale scores were computed for energy, euphoria, and self-insight (Enhancement Motives), sociability/flirtatiousness and sexiness (Social Motives), coping (Coping Motive), and conformism (Conformism Motive). A factor analysis on the 28 motives (PCA, varimax rotation) confirmed this seven-factor structure, with 66.68% of the variance explained (see Table 2).

We tested whether MDMA use had effects on the capacity of respondents to complete questionnaires. Therefore, reliabilities were computed for the group of users under influence of MDMA and other drugs and for users not (yet) under influence of MDMA separately. Below, the reliabilities for the total group of MDMA using respondents ($n = 372$) are reported. Next to these reliabilities, between brackets, α ’s are also given for the group of users who had not (yet) taken MDMA at the time of measurement (40%) and for the group of users who had taken MDMA (60%), respectively.

Energy (EnhM): four items, $\alpha = 0.84$ (0.85, 0.84), example ‘...to dance all night,’ ‘...for the energy.’ Euphoria (EnhM): three items, $\alpha = 0.59$ (0.57, 0.60), example ‘...to feel absolutely great,’ ‘...to get euphoric.’ Self-insight (EnhM): two items, $\alpha = 0.86$ (0.86, 0.85), ‘...to get to know myself better,’ ‘...to increase my self-insight.’ Sociability/flirtatiousness (SocM): eight items, $\alpha = 0.88$ (0.88, 0.88), example ‘...because it eases talking to others,’ ‘...because flirting is easier,’ ‘...dancing with someone else is nicer,’ ‘...because cuddling feels so nice.’ Sexiness (SocM): four items, $\alpha = 0.81$ (0.79, 0.83), example ‘...because I get to be a better lover,’ ‘...because it makes me horny,’ ‘...because making love is nicer.’ Coping (CopM): three items, $\alpha = 0.76$ (0.71, 0.77), example ‘...to feel well for just one time,’ ‘...to forget my problems. Conformism (ConfM): four items, $\alpha = 0.73$ (0.78, 0.71), example ‘...because my friends do,’ ‘...because it’s no fun to be sober when my friends are high,’ ‘...because it’s cool.’

Perceived Positive Effects. On the basis of earlier research (Measham, Aldridge, and Parker, 2001; Van de Wijngaart et al., 1997; Beck and Rosenbaum, 1994; Bravo, 2001; Cohen, 1995) we constructed a list of 24 items assessing the energizing, mood enhancing, and entactogenous effects MDMA users experience. Examples of items are ‘...euphoria,’ ‘...feel absolutely great,’ ‘...dance endlessly,’ ‘...open,’ ‘...sensitive,’ ‘...people are more beautiful,’ ‘...cuddly,’ ‘...better sex,’ ‘...self-insight,’ ‘...deep conversations.’ A factor analysis with a one-factor solution showed all singular items had factor loadings > 0.45 on this positive effects scale. This scale had an α of 0.91 for the total group and α ’s of 0.90 and 0.91 for users not under influence and those under influence of MDMA, respectively.

Perceived Negative Effects. A set of 11 negative psychological and physical effects were derived from earlier research (Van de Wijngaart et al., 1997; Bravo, 2001; Cohen, 1995; Davison and Parrott, 1997). These included depressive/feeling low, confusion, fear, aggression, edginess, suspiciousness, lack of control, headache, nausea, dizziness, and fainting. Factor analysis with a one-factor solution revealed that all items had factor loadings > 0.50 on the *negative effects* scale. This scale had an α of 0.85 for the total group and α ’s of 0.86 and 0.84 for users not under influence and those under influence of MDMA, respectively.

Table 2
Factor analysis on motives for using MDMA (n = 372)

	Energy	Euphoria	Self-insight	Sociability flirtiness	Sexiness	Coping	Conformism
Energy (EnhM)							
Dance all night	0.88	0.03	0.03	0.12	−0.07	0.10	0.01
Not get tired	0.86	0.01	0.05	0.10	0.00	0.04	0.09
Make it through the night	0.77	0.25	−0.04	0.12	0.07	0.10	0.05
Energy	0.64	0.23	0.05	0.03	0.30	−0.04	−0.04
Euphoria (EnhM)							
Feel absolutely great	0.28	0.73	0.02	0.11	0.09	0.12	0.10
Euphoric	0.45	0.56	0.08	0.07	0.18	0.02	−0.10
Get into the music totally	0.06	0.55	0.17	0.42	0.03	−0.04	0.10
Self-insight (EnhM)							
Get to know myself better	0.04	0.06	0.86	0.19	0.04	0.21	0.16
Increase my self-insight	0.04	0.10	0.85	0.20	0.11	0.12	0.22
Sociability/flirtatiousness (SocM)							
Flirting easier	0.07	0.09	0.00	0.81	0.16	0.12	0.21
Easier to hit on someone	0.07	0.01	0.03	0.77	0.12	0.06	0.36
More susceptible to be approached	0.08	0.04	0.13	0.75	0.14	0.12	0.25
Touching someone else is nicer	0.04	0.11	0.43	0.68	0.16	0.05	0.08
Eases talking to others	0.03	0.32	0.01	0.66	0.19	0.15	0.09
Cuddling is nicer	0.21	0.00	0.25	0.63	0.19	0.15	−0.13
Dancing with someone else is nicer	0.18	0.39	0.09	0.61	−0.04	0.07	0.05
Kissing is nice	0.07	0.07	0.21	0.60	0.35	0.23	0.15
Sexiness (SocM)							
Sex better	0.11	0.08	0.06	0.25	0.87	0.08	0.00
Making love nicer	0.09	0.11	0.08	0.30	0.84	0.09	0.06
Better lover	−0.01	0.00	0.14	0.42	0.47	0.02	0.44
Horny	0.10	0.14	0.00	0.50	0.40	0.18	0.37
Coping (CopM)							
Have less worries	0.09	0.00	0.18	0.18	0.05	0.84	0.19
Feel well for just one time	0.14	0.06	0.17	0.22	0.06	0.83	0.21
Forget my problems	−0.03	0.48	−0.01	0.14	0.19	0.53	0.11
Conformism (ConfM)							
Be cool	0.04	0.00	0.07	0.18	−0.02	0.02	0.82
Friends push me	−0.03	−0.08	0.13	0.21	0.01	0.05	0.76
Friends do so	−0.06	0.13	0.12	0.16	0.02	0.33	0.63
It's no fun to be sober when friends are high	0.14	0.19	0.10	0.04	0.15	0.25	0.60

Note: PCA varimax, variance explained: 66.68%.

Results

Descriptive Analyses on the Use of MDMA and Other Drugs

The majority of the 490 participants reported ever having used MDMA, 76%. Most respondents within the group of users used it on a regular basis: 85% took MDMA in the past month, with 30% used it once a month, 26% a few times a month, 17% used it on a weekly basis, and 11% even more often. Furthermore, 12% of the users took fewer than one pill, 46% one or two pills, 26% three or four pills, and 15% more than four pills per occasion. The majority of MDMA users were using it for a substantial period of time: 21% between 1 and 2 years and 56% 2 years or longer. Only 8% reported that they initiated use less than 6 months before completing the questionnaire (Fig. 1). Additionally, 60% reported to have taken MDMA the night they completed the questionnaire, and were therefore ‘high’ on MDMA and/or other drugs.

Most users of MDMA can be categorized as polydrug users, as they often do not restrict themselves to taking MDMA: a total of 74% reported (at least) monthly use of cannabis and 15% of psilocybin. Speed and cocaine are popular drugs among MDMA users in the

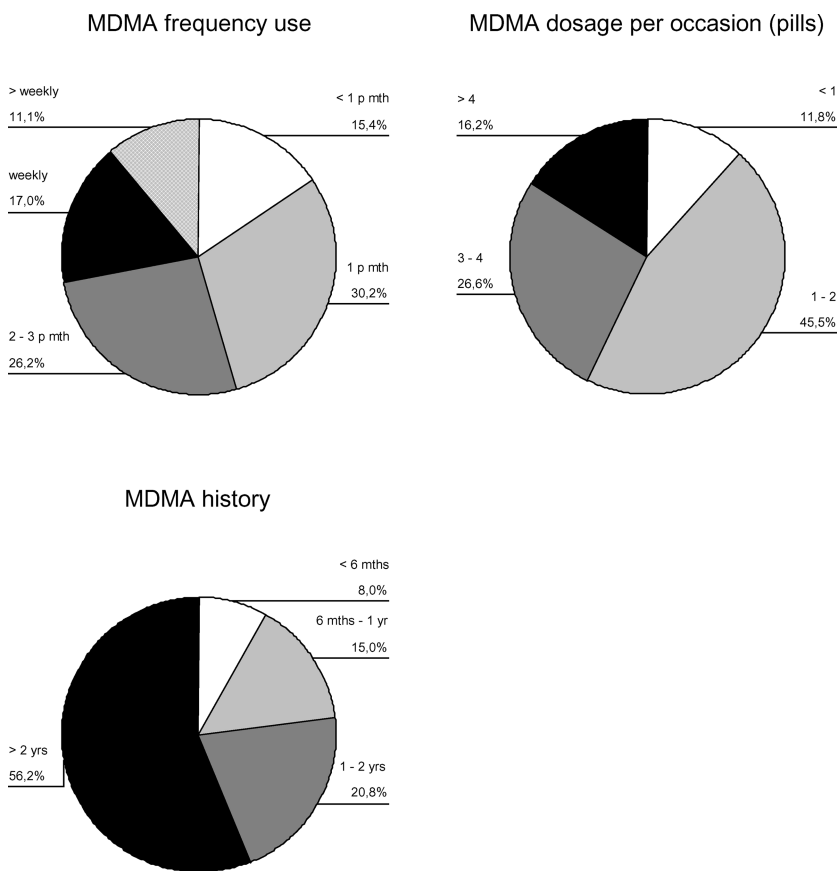


Figure 1. Frequency, dosage and history of MDMA use (MDMA users, n = 372).

Table 3

Monthly prevalence of alcohol and drug use for non-users and users, and MDMA using visitors of different parties (%)

	Non-MDMA users ^a	MDMA users ^a	Club/mellow ^b	Trance/ mainstream ^b	Hardcore ^b
Alcohol	93.4	92.5	97.6	94.3	91.4
Cannabis	36.4 ^a	74.3 ^b	53.7 ^a	71.7 ^{a,b}	78.2 ^b
Amphetamine	0.0 ^a	26.5 ^b	12.2 ^a	13.3 ^a	31.9 ^b
Cocaine	2.4 ^a	35.7 ^b	24.4 ^{a,b}	20.8 ^a	40.9 ^b
Psilocibin	1.2 ^a	15.0 ^b	12.2	17.0	15.0
n	118	372	41	53	278

^aDifferences between users and nonusers, t-tests, $p < 0.01$.

^bDifferences between MDMA-using visitors of different parties, ANOVAs, $p < 0.05$.

dance scene, 27% of our sample indicated (at least) monthly use of speed, 36% of cocaine (Table 3).

Some gender differences were found. First, male visitors to rave parties more often reported the use of MDMA (79%) compared to female visitors (68%; $\chi^2(1, 488) = 6.95$, $p < 0.01$). In addition, male users reported using MDMA more frequently, taking more pills per occasion, and having used for a longer period of time (t-tests, all $p < 0.01$).

Party and MDMA Use

Parties differ in the MDMA use of their audiences. Visitors of the club/mellow party seem to be more prudent than others in their MDMA use. None of them attempted to take more than two pills per occasion. At the trance party this percentage was 42%, at the hardcore parties 48%. Both the trance/mainstream and the hardcore group use MDMA in higher dosages than the club/mellow group [$F(2, 361) = 20.42$, $p < 0.001$].

While there were no differences in alcohol use between the groups of MDMA users and nonusers, all other drugs were taken more often by users (t-tests all $p < 0.001$) (Table 3). Within the group of users, especially the hardcore partygoers stood out with substantial last month use of cannabis, amphetamine, and cocaine (ANOVAs, all $p < 0.05$). The hardcore group used more cannabis than the mellow/club section of the party crowd. The hardcore group also took more cocaine than the trance group, and especially with its amphetamine use hardcore fans distinguished themselves from the two other MDMA using party groups (Table 3). These results suggest that the party setting is a highly relevant factor for the amount of MDMA and other drugs used.

Hierarchy of Motives

An ANOVA (Repeated Measurements, Bonferroni adjustment for multiple comparisons) was conducted on the motive scales to identify a hierarchy of scores and check if these scores differed significantly. Tests showed that the total group of users indeed hold a differentiated set of motives as indicated by Pillai's $F(6, 366) = 158.74$, $p < 0.001$. MDMA users take MDMA in the first place for the energy (estimated marginal mean = 3.81) and in the second place for the euphoria (3.51) they expect from it. A majority of the users scored above the natural mean of the scale (3.00), respectively 82% for energy and 62% for euphoria. Third

Table 4

Estimated marginal means of the hierarchy of motives for MDMA use at different parties (MDMA users, $n = 372$)

Motive	All MDMA users ¹	Club mellow ²	Trance mainstream ²	Hardcore ²
Energy (EnhM)	3.81 ^a	3.59	4.00	3.82
Euphoria (EnhM)	3.51 ^b	3.42	3.69	3.39
Soc./Flirtatiousness (SocM)	2.56 ^c	2.64	2.68	2.35
Sexiness (SocM)	2.32 ^d	2.17	2.50	2.29
Coping (CopM)	2.23 ^d	2.05 ¹	2.50 ²	1.98 ¹
Self-insight (EnhM)	2.21 ^d	2.36 ^{1,2}	2.40 ¹	1.90 ²
Conformism (ConfM)	1.54 ^e	1.36	1.67	1.55

¹In this column: ^{a-e} = differences between motives at $p < 0.05$, MANOVA RM, Bonferroni adjustment for multiple comparisons.

²Rowwise: ¹⁻³ = differences between parties at $p < 0.05$, MANOVA, Bonferroni adjustment for multiple comparisons.

ranked was the motive of anticipated sociability/flirtatiousness (2.56, 27%). Fourth, users seemed to be less motivated by sexiness (2.32, 21%), coping (2.23, 14%), and self-insight (2.21, 17%), and, fifth, only a small group admitted that conformism (1.54, 4%) accounted for their motivation to take MDMA (Table 4).

These findings show that users seemed primarily motivated by the enhancing qualities they attribute to MDMA. They take the drug to be able to dance all night and feel energetic, and they hope that if they take MDMA they will feel great. Furthermore, they like MDMA's social character, although the motives of sociability/flirtatiousness and sexiness are endorsed significantly less than the energy and euphoria motives. The scores on coping and self-insight were further below the natural mean. MDMA may help one forget problems and it may lead to better self-insight, but as motives for using the drug, these factors were not particularly important according to the users themselves. In addition, users all but denied that conformism played a role in their taking this drug. On the whole, women and men hardly differed in their endorsement of motives for taking MDMA. On five of the seven scales, no differences were found between male and female party visitors. However, male ravers were motivated more heavily towards sexiness and they reported being more susceptible to peer pressure, i.e., they conform more easily to their friends than females (MANOVA, post hoc Bonferroni, both $p < 0.05$).

Comparing club mellow visitors with the trance mainstream group and the total hardcore audience, on all seven motive scales the trance group scored highest, though, on five motives differences with other groups were not significant. The "trance/mainstream" group did stand out on the two other motives. This group was more highly motivated for self-insight than hardcore ravers, and it differentiated itself from both other groups in wanting to cope more (MANOVA, posthoc Bonferroni, all $p < 0.05$) (see Table 4). This suggests that partying is a relevant factor for the motives ravers endorse for taking MDMA. On the whole, these results indicate that a hierarchy of motives is present among party visitors.

Multivariate Analyses: Predicting MDMA Use

Three sets of variables were used to predict quantity of MDMA use. Dummies for the trance and club/mellow parties and the set of motives were added in the equation, next to

the background variables gender, age, educational level, and MDMA use of friends. Within this multivariate set-up, party remained a relevant factor associated with the quantity of MDMA use. Audiences of hardcore events used more than club/mellow partygoers. The variables gender, educational level, and the MDMA use of friends were also associated with the quantity of MDMA use. Men were found to be using more than women; highly educated participants less, and visitors within a peer group of users were using more MDMA. Three motives were relevant; visitors seeking euphoria and sexiness were using more MDMA and those wanting to be social/and trying to flirt were using less. For women, being part of the club/mellow scene predicted less MDMA use, and their seeking euphoria predicted more use. For men, next to partying in the club/mellow scene, especially friends' use, educational level, and the motives of sexiness and sociability/flirtatiousness were relevant (Table 5).

Multivariate Analyses: Predicting Perceived Positive and Negative Effects

No systematic differences were found in the way visitors to different parties describe the experienced positive effects. The total mean for the club/mellow, trance, and hardcore groups were 3.75, 3.91, and 3.79 respectively. For negative effects as well, no overall differences were found between the three groups. Total means were 1.91, 2.08, and 1.90, respectively.

Table 5
Multivariate regression analyses predicting MDMA use by control variables, party and motives (MDMA users, $n = 372$)

	MDMA use		
	Total sample ($N = 335$)	Women ($N = 103$)	Men ($N = 232$)
Control variables			
Gender	0.14 ^b	—	—
Age	0.11	0.19	0.07
Education Level	−0.18 ^b	−0.12	−0.20 ^b
Friends' MDMA use	0.20 ^c	0.16	0.23 ^c
Party (control hardcore)			
Club/Mellow	−0.24 ^c	−0.28 ^a	−0.23 ^b
Trance/Mainstream	−0.06	−0.05	−0.06
Motives			
Energy	0.00	−0.08	0.02
Euphoria	0.17 ^b	0.32 ^b	0.11
Soc./Flirtatiousness	−0.21 ^b	−0.17	−0.22 ^a
Sexiness	0.14 ^a	0.04	0.18 ^a
Coping	0.06	0.12	0.03
Self-insight	0.07	0.12	0.06
Conformism	−0.02	−0.01	−0.02
R ²	0.26	0.24	0.27

Note: Standardized parameters of the equation: ^a $p < 0.05$; ^b $p < 0.01$; ^c $p < 0.001$.

These results indicate that generally visitors to raves do indeed perceive positive effects from taking MDMA. However, although the mean for negative effects rated below the natural mean of the scale, some negative short-term effects were quite common. Prominent among these was depression/feeling low (afterwards) with a mean score of 2.55. A total of 66% of the partygoers reported they had ever experienced depression, as indicated by a score not equaling 1. Confusion (2.37, 63%) and being out of control (2.20, 61%) fell within the same range. Lower in the hierarchy stood the effects of nausea (1.98, 50%), suspiciousness (1.89, 50%), edginess (1.85, 46%), and dizziness (1.83, 46%). Less often perceived negative effects were aggression (1.66, 34%), fear (1.64, 38%), and headache (1.62, 39%). Fainting held the lowest position in this hierarchy (1.44, 21%). The prevalences for actually fainting was 1%.

With regards to negative effects of MDMA, differences were displayed between males and females, with females generally suffering more from perceived negative consequences. Women tended to experience more depression, nausea, dizziness, and headache, and they were more susceptible to feeling faint or actually fainting. As for the more psychological effects, women were more fearsome and tended to rate themselves more easily out of control and aggressive (MANOVA, posthoc Bonferroni, $p < 0.05$).

The same sets of background variables, party dummies and motives, extended with quantity of MDMA use and polydrug use, were used to predict perceived positive and negative effects. In a multivariate regression analysis, party was not related to positive effects. Some motives appeared to be relevant. Visitors motivated by euphoria, sexiness, and self-insight, experienced more positive effects. On the other hand, men motivated by conforming to their friends did not experience positive effects to the same extent as others less motivated by conforming. For females conformism appeared to be of no influence (Table 6).

From the multivariate analysis of negative outcomes it is clear that gender is a strong correlate of negative outcomes, even when controlling for a set of other relevant characteristics of audiences and their environment. Participants who indulged in polydrug use also reported to-experiencing stronger negative effects. Quantity of MDMA use was not related to suffering from direct negative effects or after-effects. Two motives were relevant even when controlling for other factors. Young people motivated by coping and, to a stronger extent, those conforming to their friends by using MDMA suffer more from negative effects (Table 6).

Results of separate analyses for men and women showed interesting differences. For women, age was a relevant factor, with older females experiencing less negative outcomes. For men polydrug use was related to experiencing negative effects. The differences between males and females regarding the association between motives and negative effects were remarkable. Women, who tried to cope with their problems by using MDMA, risked multiplying their problems with physical inconveniences and psychological trouble, but conforming to friends had no effects. For men these relations held the other way around. Their coping with problems had no negative effects, but their wanting to conform to the MDMA use of their friends was strongly associated with these negative outcomes (Table 6).

Discussion

The party environment is a natural habitat for research on MDMA use and its effects. We interviewed MDMA users at the places where they are known to gather. However, doing research in the party circuit obviously has some disadvantages. First, we did not exactly

Table 6

Multivariate regression analyses predicting positive and negative effects of MDMA by control variables, MDMA use, polydrug use and motives (MDMA users, $n = 372$)

	Positive effects			Negative effects		
	Total sample	Women	Men	Total sample	Women	Men
Control variables						
Gender	-0.07	—	—	-0.28 ^c	—	—
Age	-0.01	-0.10	0.02	-0.06	-0.32 ^b	0.08
Education level	0.04	-0.02	0.05	0.00	-0.07	-0.02
Friends' MDMA use	0.09	-0.02	0.10	-0.09	-0.11	-0.08
Quantity MDMA use	0.02	0.08	0.01	0.05	0.11	0.02
Polydrug Use	-0.05	-0.11	-0.02	0.21 ^c	0.08	0.24 ^c
Party (control hardcore)						
Club/mellow	0.00	-0.01	0.01	0.08	0.26 ^a	0.03
Trance/mainstream	-0.02	-0.17	0.04	0.05	0.00	0.10
Motives						
Energy	0.09	-0.01	0.13	-0.01	0.00	0.00
Euphoria	0.28 ^c	0.23 ^a	0.31 ^c	-0.07	-0.18	-0.04
Soc./Flirtatiousness	0.11	0.05	0.14	-0.01	0.19	-0.02
Sexiness	0.31 ^c	0.36 ^b	0.30 ^c	0.11	-0.22	0.18 ^a
Coping	0.06	0.05	0.04	0.17 ^b	0.41 ^c	0.03
Self-insight	0.26 ^c	0.26 ^b	0.23 ^c	-0.01	0.14	-0.08
Conformism	-0.20 ^c	-0.10	-0.22 ^c	0.30 ^c	0.09	0.44 ^c
R ²	0.50	0.42	0.55	0.28	0.36	0.31

Note: Standardized parameters of the equation: ^a $p < 0.05$; ^b $p < 0.01$; ^c $p < 0.001$

know the composition of the cocktail of MDMA and other drugs that may have been used by the visitors we interviewed. It is not clear to what extent perceived positive and negative effects truly resulted from MDMA use alone. Still, there is some indication that self-reports on MDMA use are valid. Van de Wijngaart et al. (1997) examined the validity of self-reports on MDMA use by comparing self-reports with urine samples taken from partygoers the night of the party in a sample of 310 visitors. In 93% of the cases the self-report matched the outcome of the analysis of the urine sample, 3% overestimated their MDMA use (i.e., people reported to have used MDMA but analysis of their urine sample showed no signs of MDMA use), and 4% underestimated their use (i.e., they reported not to have used MDMA while analysis showed the opposite). Van de Wijngaart et al.'s findings provide evidence for the validity and reliability of self-reports on MDMA use. Furthermore, compared to visitors who did not use MDMA, respondents in our sample who had used the drug that same night showed that they could rate scales as consistently as the first group. Both these results support the assumption that even in party environments questionnaires can be used as tools for assessment.

A definite answer on the question of reliability may result from having respondents fill in the same questionnaire once more when they are sober. However, even in the Netherlands with its relative liberal policy on MDMA use, this test-retest procedure is difficult to proceed

with. MDMA is an illegal substance. In our study, we asked respondents to write down their address or e-mail address so that we could approach them in the following weeks, and we guaranteed absolute secrecy. Only 2% of the MDMA using participants were willing to be approached at home by giving their address and/or e-mail address. So, we could not conduct such tests.

In addition, we may have systematically missed parts of the audience. We had to find relatively quiet spots away from the dance floor in order to conduct our research, but this may have resulted in underrepresentation of the group of visitors totally motivated by dancing. More serious is the potential absence of the group of “heavy” MDMA or polydrug users in our sample. “Heavy” users may have simply been too drugged to even consider filling in questionnaires. Also, from our observations it appeared that the 10% of our respondents not able to complete the form seemed to be heavy under the influence. Therefore, no reliable conclusions can be drawn on the quantity and frequency of MDMA and other drugs taken by visitors of rave parties. However, it should be stated that it was also not our purpose to conduct a study that would provide representative data on MDMA use in the Netherlands. As for negative short-term effects, our results must as well be interpreted cautiously. Though we found no association between amount of MDMA taken and negative effects, using large doses of the drug may still have these negative effects.

With these procedural and methodological shortcomings mentioned, we want to stress that research in the heart of the party scene is rare and that our research resulted in uncovering some interesting associations. Raves being what they are, do not resemble—to name their opposite—laboratories; however, as salient cultural context for MDMA use, research should try to adapt to the conditions and not be made impossible by rigidly applied methodological concerns. While the examination of neurological, physical, and cognitive effects of MDMA use is fit for research in the laboratory, the study of motives for MDMA use and the experience it produces can be located in the party environment itself, and even there the majority of users and nonusers of the drug seem to be able to function as credible informants on their state of mind.

Our first research question referred to MDMA use in different settings: are different kinds of parties characterized by different forms of MDMA use? The answer is yes. At hardcore parties a larger part of the audience uses MDMA and other drugs; visitors of parties qualified as trance/mainstream and hardcore use more MDMA than visitors of club/mellow parties; hardcore fans indulge in higher polydrug use than the other groups. This all indicates that the type of party is a relevant correlate of drug use.

The audiences of all parties are sharply divided: non-MDMA using attendees use less other drugs as well and they have a circle of friends predominantly not using MDMA. For this group, last-month prevalences for cocaine and amphetamine use are low or close to zero and only cannabis use is relatively common, though in this respect as well they are more modest than their MDMA-using peers. This can be seen as evidence for all party crowds being divided in relatively homogenous subgroups. On the one hand, there are subgroups low on the use of MDMA and other drugs. On the other hand, groups exist where taking MDMA next to other drugs is common or even the rule. Nonusing groups are relatively rare at hardcore parties.

The party context itself probably does not elicit MDMA use, i.e., the party is not a situational influence on drug use. Party culture can be interpreted as a marker for a more general lifestyle. For instance, an aesthetic preference for hardcore music and hardcore dance parties is part of a lifestyle that not only covers dress, appearance, and hairdo, but also implies drug use. Hardcore fans express that they want to live their life “to the hilt,” at least the weekend part of it. A preference for energizing drugs like MDMA, and next

to it amphetamine and cocaine, fits seamlessly into this lifestyle (Verhagen et al., 2000; Van Aerts, 1998). A party is the ultimate opportunity to express this lifestyle collectively. This means that party culture is not a cause, or situational factor, of drug use; it is the expression of a lifestyle in which drugs play an important (hardcore) or less important (trance/mainstream or club/mellow) role.

The second research question referred to the mindset of MDMA users and addressed a hierarchy of motives: which hierarchy of motives is relevant for party audiences? This hierarchy itself is roughly the same for all partygoers. First, energy and second, euphoria are the most important motives for using MDMA. MDMA is a drug that also facilitates social life, but the social motive for using the drug is less important than energy and euphoria.

All groups of visitors tend to deny that conformism plays a role in their drug use. It is not clear whether these low scores are a reflection of true absence of conformism or of social desirability. A second indication of the pressure to conform may be deduced from the scores on the proportion of friends using MDMA. Our findings point to the fact that MDMA use by friends is associated with own MDMA use, suggesting that pressure to use or to abstain from MDMA does exist. The trance/mainstream and hardcore groups had more of their peers using MDMA. The club/mellow visitors distinguished themselves from the respondents in the other two groups with more differentiated circles of friends and less MDMA use. This group also had the lowest scores on the conformism motive, though differences with the two other groups were not significant. In a multivariate set-up, conformism was not related to quantity of MDMA use, while MDMA use by friends was, suggesting that MDMA use by friends is a better indicator of conformism than conformism itself. Young people deny they are motivated to do what their friends do; in fact they seem to conform to rules on drug use in their circle of friends.

The third and fourth questions referred to the association of motives and party culture with quantity of MDMA used, and positive and negative effects in a multivariate set-up. For both men and women, visiting hardcore parties is associated with the use of a greater quantity of MDMA, emphasizing once more the relevance of the party factor. For women this was the only significant predictor next to the motive of euphoria. For men, the use of drugs by friends also promotes one's own MDMA use, which again, indicates that for them, taking MDMA is a social ritual in which peer pressure may be of substantial influence. Women on the whole not only take less drugs than men, their greater prudence in taking drugs is visible all along the range of educational levels, while men with lower education tend to use more drugs.

Motives are to some extent associated with quantity of use. People motivated for euphoria take more MDMA. Especially for women, euphoria is linked to taking more MDMA. The prevalence of this motive indicates that higher quantities of MDMA are hoped for to be facilitators of a better mood. Those seeking sociability and flirting use less MDMA. While taking more MDMA pills may help to get into a better mood, it may thwart talking to others and sending and interpreting clues in the game of flirting. For men the quantity of MDMA use is associated with the motive of sexiness, but it is counteracted by the motive to be sociable and flirt. Men seem to believe that if they want to feel sexier, taking more MDMA may promote that feeling. On the other hand, it may be common knowledge in the group of male ravers that if they want to be sociable and flirt, using large quantities of MDMA may not help. Earlier research (e.g., Zinberg, 1984) stated that mood enhancement and sociability were prime effects of MDMA. Our findings suggest that MDMA users know that taking more MDMA may help to get into an excellent mood and feel sexier, but that beyond a certain level the dosage hampers the sensitive mechanisms of social life and romance.

Motives are important predictors of positive and negative effects. Multivariate results show that the motives of euphoria, sexiness, and self-insight are associated with positive effects. Conformism exerts a downward pressure on the experienced positive effects. Especially men, trying to conform to their peers, may find MDMA not as pleasant a drug as their friends claim. On the whole, people who hold enhancement motives seem to get what they want: a better mood, and positive experiences of the self and relation to others. Ravers conforming to their peers seem to be at a disadvantage regarding perceived positive effects, while those coping do not seem to benefit from taking MDMA. It is remarkable that quantity of MDMA used is not an enhancer of positive effects.

Men who take drugs because they want to project a 'cool' image, who are motivated by fear of rejection of their friends, do not only experience less positive effects, but also suffer from more negative physical and psychological consequences resulting from MDMA use. For them the conformism motive is strongly associated with negative effects, next to regular polydrug use. Polydrug use may be a marker for using other drugs as cocaine and amphetamine at parties as well. Acute experienced negative effects and a drug hangover may not be a result from using MDMA but from taking a whole cocktail of drugs and alcohol. The interpretation of negative effects, particularly resulting from polydrug use, is supported by another result: quantity of MDMA use itself does not have any reinforcing effect on the experience of negative consequences.

For women, age is positively related to less negative effects. Zero-order correlations between age and the various negative effects show that older female users are less fearsome, less confused, and feel less like fainting than younger women do. This suggests that women do learn how to avoid a panic reaction and how to prevent themselves from fainting as a result of MDMA's physical and psychological effects. For women the conformism motive is not associated with negative effects as it is for men. In their group the motive of coping increases the odds of having a bad MDMA trip. In itself it is understandable that drugs do not help to alleviate a problematic situation. Women wanting to escape their problems may end up increasing their problems with all kinds of negative consequences of MDMA use. What is puzzling is that the same does not apply to men, who only seem negatively affected by conformism.

It is remarkable that hardcore fans do not report any more negative effects of their drug use than their peers who generally use fewer drugs. Hardcore is rough, noisy music to outsiders and it is especially this quality of their music that hardcore fans appreciate. Like other young people they use their preference for this special kind of music as a way of defining their social identity. People who like it belong to the scene, those who despise it are qualified as outsiders (Ter Bogt et al., 2002; Verhagen et al., 2000; Van den Eijnden, 1997). *Hardcore* parties are characterized by a tough kind of comradeship. Hardcore fans listen to the loudest music, indulge in high polydrug use, and are part of networks of friends with a higher proportion of users. By their own description, these fans 'come on hard,' both by dancing all night and by doing drugs (Verhagen et al., 2000; Van den Eijnden, 1997). Our results imply that a special way of experiencing negative effects of MDMA use is part of this mindset too. Liking rough music and taking more drugs than other young people—knowing this and being proud of it—may belong to a more general 'orientation of toughness' in which complaining about negative effects is something of a taboo.

Hardcore visitors do not report more negative effects. For them and the other MDMA-using party visitors, negative effects are predicted by the motives of wanting to cope and to conform, by regular polydrug use and gender. Hardcore party visitors do not stand out with

higher conformism. They do want to cope less than the other groups and more often indulge in polydrug use, both factors that exert an upward pressure on the reporting of negative effects. That leaves gender, i.e., being a male visitor, as the only factor exerting influence the opposite way. This suggests that the group of hardcore party visitors seems to account for no more negative effects than other groups, at least partly, because most of them are men; men in relatively homogenous subgroups of MDMA-using-friends. The hardcore group's relatively low level of reported negative effects can be interpreted as an effect of its gender composition. The conclusion lies at hand that the aforementioned 'orientation of toughness' flourishing among hardcore party visitors is attributable to that same composition. Hardcore fans come on hard, and if they suffer from acute negative consequences, they seem to be inclined to dismiss them as not very serious.

In short, it appears to be possible to develop reliable quantitative research tools for MDMA use, motives, and effects, which can be used within the party environment. Besides gender, party culture itself is a key factor for research on MDMA use and its effects in the dance scene, and so are motives, supporting Zinberg's (1984) theorem of the relevance of setting (party culture) and set (frame of mind) for the study of psychoactive substances. Furthermore, our results indicate that Cox and Klinger's (1988) scheme of motives, originally devised in alcohol research, is useful for the study of MDMA as well. Enhancing, social, coping, and conformism motives can be defined and validated for this field, too. Alcohol research showed that different motives are linked to different patterns of use. We found evidence for differentiated connections of motives for MDMA use with positive and negative effects attributed to MDMA use.

The debate on the possible neurotoxic effects of MDMA use is beside the topic of this study. However, we would like to stress that, even if one takes a liberal position in this debate, it is clear that at Dutch parties unsafe use of MDMA is widespread and maybe even the rule. In his review of toxic effects of MDMA, Van Aerts (1998) warns users not to take more than 'one MDMA pill' per occasion; pills generally contain between 50 and 150 mg of active ingredients. Others are more cautious and indicate that even taking a single dose of MDMA potentially results in serotonergic and dopaminergic neurotoxicity (e.g., Gijsman et al., 1999; Parrott, 2000). We defined 'heavy' MDMA use as taking three to four pills per occasion and 'excessive' MDMA use as taking five pills or more per occasion. At the club/mellow party no user fell into these categories. At the trance/mainstream party we found 28.3% 'heavy' and 13.2% 'excessive' users. The figures for the hardcore parties were even higher, 30.0% and 18.4%, respectively.

Rave culture is an international phenomenon, and while countries may differ on the popularity of subgenres, across regions mellow, hardcore, and popular varieties are discernable (Reynolds, 1998). We therefore assume that MDMA use patterns in the Dutch rave culture and the motives for drug use may be informative for the situation in other countries.

Regarding MDMA, the Netherlands is an interesting test case. Not only is this country the biggest producer and distributor of the drug (INCB, 2004), it also has a well-organized, flourishing rave culture and a fairly nonrepressive state policy on possession of MDMA. Though MDMA is an illegal substance and production and distribution is judicially prosecuted, and organizers of raves should prevent MDMA users and their drugs from entering parties, users are not arrested when they carry a few pills for personal consumption. While this economic and cultural context combined with a relatively liberal judicial policy may seem to foster MDMA use, there has not occurred an epidemic of MDMA use in the '90s among adolescents and young adults. The use of the drug is to a large extent confined to house parties and/or city nightlife, and only a small minority of adolescents and young adults

has ever tried the drug. An even smaller fraction uses it on a regular basis. Though MDMA use is definitely part of party culture in the Netherlands, compared to, for instance, the U.S., lifetime and current prevalence of MDMA use is relatively low (Hibbel, Andersson, and Bjarnason, 2000).

The core of Dutch “demand and harm reduction” policy consists of three strategies: education of the public on the effects and potential harm of different forms of drug use, monitoring of the drug market, and harm reduction in case prevention strategies fail and drugs are used. Regarding MDMA, throughout the country it is possible to have pills tested for their ingredients at institutes that also function as drug information centers. Thus, through the Drugs Information and Monitoring System (DIMS) the market can be monitored closely and in case pills with other dangerously toxic substances next to MDMA appear on the market, the public can be noted instantly. Furthermore, local authorities can regulate house parties by fixing the maximum amount of visitors to parties, and by requiring the presence of First Aid facilities, air-conditioning systems, and enough free drinking water (NDM, 1999; Tweede Kamer der Staten Generaal, 2003).

Research has indicated that prevention strategies work best when people are addressed through several channels, i.e., a community approach linked with activating interventions at home and in school, and supported through mass media campaigns (National Institute on Drug Abuse, 1997). These principles form the heart of Dutch educational efforts: 1) encouraging (young) people to find information themselves on the effects and potential harm of different forms of drug use, 2) school-based education on drugs; and 3) support for parents and teachers trying to educate their children/students on drugs (Wetser and De Jong, 1998). While it is impossible to causally trace back relatively low prevalences of MDMA use (in a country where MDMA is easily obtainable and cheap) to this set of prevention and harm reduction policies, it is fair to conclude that (at least in the context of Dutch society) there are no signs that these policies do not work and they may be informative for prevention and harm reduction strategies elsewhere.

Focusing on the house scene, our results indicate that prevention strategies should be directed at the whole scene, while even our nonsystematic account of current prevalence of MDMA use depicts high percentages of use across different parts of the rave scene. However, especially hardcore and trance parties should be targeted because a substantial part of its audience indulges in taking (by all means) dangerously high dosages of MDMA at a time. Two groups within the house community seem to be particularly at risk for acute unpleasant effects: men who conform to their friends by using the drug, and women taking it to forget their problems. In the Netherlands, educational initiatives start with the message that ‘there is no safe XTC use’ but ‘if you take it, be aware of potential harm and don’t overindulge’ (Trimbos-instituut, 2004). We think our results indicate that one line should be added to these educational efforts: ‘and never take XTC for the wrong reasons.’

Together, these findings on party cultures of MDMA use suggest that information on the possible negative (long-term) effects of MDMA use should particularly be directed at specific kinds of parties that cater to specialized audiences. The task of educating the public may be difficult in the case of MDMA. Our results indicate that, on the whole, users experience MDMA as a great drug. Its direct effects within the context of a mass gathering of people holding the same musical preference—in itself an uplifting factor—is euphoria, the feeling the night will never end, and intimate contact with others. Even though salient minorities of users experience acute negative effects themselves, most ravers may find it hard to believe that this drug may have detrimental long-term effects.

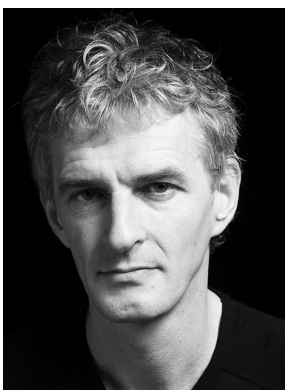
RESUME

Cette étude examine les motifs et les conséquences de l'utilisation de MDMA dans le cadre de différents types de soirées de danse aux Pays-Bas (2001 et 2002). Les participants étaient 490 visiteurs de trois types différents de rave parties, "club/mellow," "trance/mainstream," et "hardcore" (34% de femmes, âge moyen 22,3 ans, 76,5% d'utilisateurs de MDMA). Les motivations primaires des visiteurs de ces soirées sont les effets énergisants et euphorisants attendus du MDMA. Le dosage du MDMA est lié aux styles de soirées hardcore et trance/mainstream, avec pour motifs l'euphorie, la sexualisation, la perspicacité autocentrée et la sociabilité/propension au flirt (négatif), et liée au sexe de la personne, au niveau d'instruction (négatif) et à l'utilisation de MDMA par l'entourage. Les femmes font état d'effets négatifs (aigus) plus nombreux que les hommes—dépression, confusion, perte de contrôle, suspicion, tension, nausée, vertiges—en particulier les femmes cherchant à remédier à leurs problèmes en prenant du MDMA courent des risques. L'utilisation de plusieurs drogues par les hommes et leur volonté de se conformer au comportement de leur entourage en prenant du MDMA sont liées à des effets négatifs.

RESUMEN

El presente estudio examina los motivos y consecuencias del consumo de MDMA en diferentes tipos de fiestas dance en los Países Bajos (durante 2001 y 2002). Los participantes en el mismo han sido 490 asistentes a tres tipos de fiestas rave: 'club/mellow,' 'trance/mainstream,' y 'hardcore' (34% mujeres, edad media 22,3 años, 76,5% consumidoras de MDMA). La principal motivación de los asistentes a estas fiestas la constituyen los efectos energéticos y eufóricos que esperan del MDMA. La cantidad de consumo de MDMA está asociada a las fiestas de estilo hardcore y trance/mainstream, con motivaciones de euforia, atractivo sexual, imagen propia y sociabilidad/insinuación (negativo), y con el sexo de la persona, nivel de educación (negativo) y el consumo de MDMA por parte de los amigos. Las mujeres presentan más efectos negativos (agudos) que los hombres, como depresión, confusión, pérdida de control, desconfianza, tensión nerviosa, náuseas, mareo; en particular, aquellas mujeres motivadas a consumir MDMA para afrontar sus problemas corren riesgo. El consumo de polidrogas por parte de los hombres, y en particular su motivación para comportarse como sus amigos consumiendo MDMA son aspectos asociados con los efectos negativos.

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References

- Beck, J., Rosenbaum, M. (1994). *Pursuit of Ecstasy: The MDMA Experience*. New York: State University of New York Press.
- Bravo, G. L. (2001). What does MDMA feel like? In: Holland, J., Ed. *Ecstasy: The Complete Guide: A Comprehensive Look at the Risks and Benefits of MDMA*. Rochester: Park Street Press (pp. 21–28).
- Cohen, R. S. (1995). Subjective reports on the effects of the MDMA (ecstasy) experience in humans. *Progress in Neuro-psychopharmacology & Biological Psychiatry* 19:1137–1145.
- Cooper, M. L. (1994). Motivations for alcohol use among adolescents: development and validation of a four factor model. *Psychological Assessment* 6:117–128.
- Cooper, M. L., Frone, R., Russell, M., Mudair, P. (1995). Drinking to regulate positive and negative emotions: a motivational model of alcohol use. *Journal of Personality and Social Psychology* 69:990–1005.
- Cox, M., Klinger, E. (1988). A motivational model of alcohol use. *Journal of Abnormal Psychology* 97:168–180.
- Curran, H. V. (2000). Is MDMA (ecstasy) neurotoxic in humans? An overview of evidence and of methodological problems in research. *Neuropsychobiology* 42:34–41.
- Curran, H. V., Travill, R. A. (1997). Mood and cognitive effects of 3,4-Methylenedioxymethamphetamine (MDMA, ecstasy): weekend high followed by midweek low. *Addiction* 92:821–831.
- Davison, D., Parrott, A. C. (1997). Ecstasy (MDMA) in recreational users: self-reported psychological and physiological effects. *Human Psychopharmacology* 12:221–226.
- De Zwart, W. M., Stam, H., Kuipers, S. B. M. (1997). *Kerngegevens roken, drinken, druggebruik en gokken onder scholieren vanaf 10 jaar* [Basic Data on Smoking, Drinking, Drugs and Gambling of Students of 10 Years and Older]. Utrecht: Trimbos-instituut.
- Engels, R. C. M. E., Van Gorp, K., Lemmers, L. (2001). Drinking motives, alcohol expectancies, self-efficacy, and drinking patterns. Society of Research on Alcohol and Drugs, Skarpö, April 23–26.
- Forsyth, A. J. M. (1996). Places and patterns of drug use in the Scottish dance scene. *Addiction* 91:511–521.
- Forsyth, A. J. M., Barnard, M., McKeganey, N. P. (1997). Musical preference as an indicator of adolescent drug use. *Addiction* 92:1317–1325.
- Gijssman, H. J., Verkes, R.-J., Van Gerven, J. M. A., Cohen, A. F. (1999). MDMA study. *Neuropsychopharmacology* 21:597.
- Hegadoren, K. M., Baker, G. B., Bourin, M. (1999). 3,4-Methylenedioxymethamphetamine analogues of amphetamine: defining the risks to humans. *Neuroscience and Behavioral Reviews* 23:539–553.

- Hibbel, B., Andersson, B., Bjarnason. (2000). *The 1999 ESPAD Report: European School Survey Project on Alcohol and Other Drugs (ESPAD): Alcohol and Other Drug use Among Students in 30 European Countries*. Stockholm: CAN.
- INCB (2004). *Report of the International Narcotics Control Board for 2003*. New York: United Nations.
- Konijn, K. Z., Pennings E. J. M., Wolff, F. A. (1997). *XTC: Klinische en toxicologische aspecten [XTC: Clinical and Toxicological Aspects]*. Leiden: LUMC.
- Korf, D. J., Nabben, T., Schreuders, M. (1995). *Antenne 1995: Trends in alcohol, tabak, drugs en gokken bij jonge Amsterdammers [Antenna 1995: Trends in Alcohol, Tobacco and Drug Use, and Gambling of Young Inhabitants from Amsterdam]*. Amsterdam: Jellinek.
- Measham, F., Aldridge, J., Parker, H. (2001). *Dancing on Drugs: Risk, Health and Hedonism in the British Club Scene*. London: Free Association Books.
- Morgan, M. J. (2000). Ecstasy (MDMA): a review of its possible persistent psychological effects. *Psychopharmacology* 152:230–248.
- Mutsaers, L. (1998). *Beat crazy: Een pophistorisch onderzoek naar de impact van de transnationale dansrages twist, disco en house in Nederland [Beat crazy: a pop historical account of the impact of the transnational dance crazes twist, disco and house.]* Utrecht: Utrecht University.
- NDM. (2004). *Nationale Drug Monitor: Jaarbericht 2003 [National Monitor on Drugs: Annual Report 2003]*. Utrecht: Bureau NDM.
- NDM. (1999) *Factsheet harddrugbeleid XTC: Update 1999 [Fact sheet hard drug policy XTC: Update 1999.]* Utrecht: Bureau NDM.
- National Institute on Drug Abuse (NIDA) (1997). *Preventing Drug use Among Children and Adolescents: A Research-Based Guide*. Washington, DC: Author.
- Parrott, A. C. (2000). Human research on MDMA (3,4-methylenedioxyamphetamine) neurotoxicity: cognitive and behavioural indices of change. *Neuropsychobiology* 42:17–24.
- Parrott, A. C., Sisk, E., Turner, J. J. D. (2000). Psychobiological problems of heavy ecstasy (MDMA) polydrug users. *Drug and Alcohol Dependence* 60:105–110.
- Reneman, L., Booij, J., De Bruin, K., Reitsma, J. R., De Wolff, F. A., Gunning, B. W., Den Heeten, G. J. (2001). Effects of dose, sex, and long-term abstinence from use on toxic effects of MDMA (ecstasy) on brain serotonin neurons. *Lancet* 358:1864–1869.
- Reneman, L., Booij, J., Schmand, B., Van den Brink, W. (2000). Memory disturbances in 'ecstasy' users are correlated with an altered brain serotonin neurotransmission. *Psychopharmacology* 148:322–324.
- Reynolds, S. (1998). *Generation Ecstasy: Into the World of Techno and Rave Culture*. Boston: Little, Brown and Company.
- Rietveld, H. (1998). *This Is Our House: House, Music, Cultural Spaces and Technologies*. Aldershot: Ashgate.
- Sikkema, P. (1997). *Jongeren '97: Generatie op afstand [Youth '97: Generation at a Distance]*. Amsterdam: NSS/Interview.
- Ter Bogt, T. (2000). De geschiedenis van jeugdcultuur en popmuziek. In Ter Bogt, T., Hibbel, B., eds. *Wilde jaren: Een eeuw jeugdcultuur en popmuziek [Wild Years: A Century of Youth Culture and Pop Music]*. Utrecht: Lemma. pp. 27–151.
- Ter Bogt, T., Engels, R., Hibbel, B., Van Wel, F., Verhagen, S. (2002). Dancestasy: dance and MDMA use in the Netherlands. *Contemporary Drug Problems* 29:157–181.
- Trimbos-instituut. (2004). *XTC: De antwoorden [XTC: The answers]*. Utrecht: Trimbos-instituut, Netherlands Institute of Mental Health and Addiction.
- Tweede Kamer der Staten Generaal (2003). *Beleid inzake XTC*. [(Dutch) Lower House, Policy on XTC] Den Haag: SDU.
- Van Aerts, L. (1998). Toxicity of ecstasy. In: Saunders, N., ed. *Ecstasy Reconsidered*. London: Saunders.
- Van de Wijngaart, G., Braam, R., De Bruin, D., Fris, M., Maalsté, N., Verbraak, H. (1997). *Ecstasy in het uitgaanscircuit: Sociaal-epidemiologisch onderzoek naar de aard, omvang en risico's van het gebruik van XTC en andere uitgaansdrugs op houseparty's [Ecstasy and Night Life. A*

- Social-Epidemiological Enquiry on the Character, Prevalence and Risks of use of MDMA and Other Party Drugs at Rave Parties]. Utrecht: CVO.
- Van den Eijnden, M. (1997). 'Kort' op 200 BPM: Een etnografische studie naar de levensstijl van een groep gabbers in Utrecht ['Wild' on 200 BPM: An ethnographic study on the lifestyle of a group of gabbers in Utrecht.] Utrecht University: Utrecht, (thesis).
- Verhagen, S., Van Wel, F., Ter Bogt, T., Hibbel, B. (2000). Fast on 200 beats per minute: The youth culture of gabbers in the Netherlands. *Youth & Society* 32:147–164.
- Wareing, M., Fisk, J., Murphy, P. N. (2000). Working memory deficits in current and previous users of MDMA ('ecstasy'). *British Journal of Psychology* 91:181–188.
- Wetser, P., De Jong, A. (1998). *Uitgaan en drugs: Plan voor een samenhangende preventieaanpak van recreatief druggebruik (1998–2001)* [*Leisure and Drugs: Plan for an Integral Prevention Strategy on Recreational Drug Use (1998–2001)*]. Utrecht: Trimbos-instituut, Netherlands Institute of Mental Health and Addiction.
- Williamson, S., Gossop, M., Powis, B., Griffiths, P., Fountain, J., Strang, J. (1997). Adverse effects of stimulant drugs in a community sample of drug users. *Drug and Alcohol Dependence* 44:87–94.
- Zinberg, N. (1984). *Drug, Set, and Setting*. New Haven: Simon and Schuster.