

Published in final edited form as:

Int J Public Health. 2010 December ; 55(6): 571–579. doi:10.1007/s00038-010-0155-2.

Factors associated with condom use among young adult ecstasy users

Kirk W. Elifson,

Rollins School of Public Health, Emory University, Atlanta, USA

Hugh Klein, and

Kensington Research Institute, 401 Schuyler Road, Silver Spring, MD 20910, USA

Claire E. Sterk

Rollins School of Public Health, Emory University, Atlanta, USA

Hugh Klein: hughk@aol.com

Abstract

Objective—This paper examines the prevalence of and the factors associated with condom use in a sample of 283 young adult ecstasy users.

Methods—The study, which relied upon targeted sampling and ethnographic mapping, took place between 2002 and 2004. It entailed conducting two-hour-long, face-to-face interviews in the Atlanta, Georgia metropolitan area.

Results—Condom use was inconsistent; only 35.2% of all sex acts were protected. Using multiple regression, five factors were related to condom use: race (Caucasians used condoms less than other groups), income (lower income = greater condom use), relationship status (persons involved in relationships reported less condom use than those who were not “involved”), multiple sex partners (multiple sex partners = more condom use), and condom use self-efficacy (higher efficacy level = more condom use).

Conclusions—Condom use rates were not optimal in this population. In particular, targeted interventions are needed for Caucasian ecstasy users. Intervention efforts ought to address relationship (in)fidelity as it pertains to engaging in safer sex practices, especially among persons involved in relationships. Intervention efforts also need to work to increase condom use self-efficacy.

Keywords

HIV/AIDS; Ecstasy users; Drug users/abusers; Substance use/abuse; Unsafe sex; Condom use; Predictors

Introduction

The drug known colloquially as ecstasy or MDMA (3,4-methylenedioxymethamphetamine) has grown in popularity in the United States in recent years (National Institute on Drug Abuse [NIDA] 2001), demonstrating particularly sharp increases in prevalence between the 1990s and early 2000s. Ecstasy use appears to be most popular among adolescents and young adults (NIDA 2001), and historically has been associated with partying and the “club

scene” among members of this population. Its use in raves—that is, “underground” music and dance clubs targeting teenagers and young adults—has been well-documented since the 1990s and it is in that arena that most people are aware of the presence of this drug.

In recent years, though, ecstasy use appears to have been moving out of the “club scene” (where it still remains popular today) and into new environments (Boeri et al. 2004; NIDA 2001). Nowadays ecstasy is used by a broader array of people in a broader array of social environments (Boeri et al. 2004; Sterk et al. 2006). As a result of its proliferation, researchers have begun to assess the risks associated with the continued use of this drug. Some studies have reported a link between ecstasy use and such physiological problems as alterations in serotonin production (Buchert et al. 2004), sleep disorders (Montoya et al. 2002), and mood disorders (Montoya et al. 2002; Verheyden et al. 2003). Only recently has attention been paid to one very important aspect of risk associated with ecstasy use—namely, HIV risk—and almost all of the published literature focusing on HIV risk among ecstasy users has been based on samples of men who have sex with other men (since the drug has been particularly popular in the gay community for the past decade or so). In the gay community, ecstasy use has been linked with a variety of HIV-related risk practices (e.g., having unprotected sex, having sex with multiple partners, having sexual relations while under the influence of ecstasy and other drugs) (Klitzman et al. 2002; Klitzman and Pope 2000; Lee et al. 2003; Mattison et al. 2001), and its use typically appears to co-occur alongside the consumption of a variety of other drugs (Lee et al. 2003; NIDA 2001; Sterk et al. 2006). Generally speaking, however, the extent to which ecstasy use is related to engaging in HIV-related risk behaviors has not been well-documented in persons who are not gay males.

In the present study, we examine this very issue. Relying upon a community-based sample of recurrent users of ecstasy, we focus on the extent to which ecstasy users reported having multiple sex partners in the recent past and on the predictors of recently having had more than one sexual partner. This subject is of especial interest and importance because, more than most drugs, the use of ecstasy creates a profound increase in sexual desire in its users (Zemishlany et al. 2001). Furthermore, many of the users of this drug report feeling emotionally closer to their sexual partners while high on ecstasy (Buffum and Moser 1986) and cite this as a reason for wanting to use the drug. It therefore stands to reason that a drug (like ecstasy) that is used specifically because of its perceived/anticipated sex-enhancing effects may cause users to practice unsafe sex, due to having sexual relations while under the influence of the drug.

Method

Procedures

A cross-sectional study was conducted in Atlanta, Georgia among 283 ecstasy users between the ages of 18 and 25 from August 2002 until August 2004. The principal goals of this study were to examine life issues and challenges, substance use and abuse, psychological and psychosocial functioning, and a variety of HIV-related risk behaviors among young adult ecstasy users.

In order to participate in the study, several eligibility criteria had to be met. Study participants had to be between 18 and 25 years of age, capable of conducting their interviews in English, not be in a substance abuse treatment program or any other institutional setting at the time of enrollment in the study, and not be intoxicated or otherwise impaired cognitively at the time of their interview. To make sure that recurrent users (as distinguished from first-time or experimental users) of ecstasy comprised the study

sample, all persons had to report having used ecstasy on at least three different days during the preceding 90 days.

The initial recruitment was based largely on targeted sampling, including ethnographic mapping (Sterk 1999; Watters and Biernacki 1989). Ethnographic mapping was used to identify the wide variety of settings in which ecstasy was being used, as well as to facilitate the identification of the wide variety of people who were users of the drug. It is a common component of targeted sampling to ensure that the study population represents the “depth” of locales in which a particular target population may be found and the “depth” of the types of persons comprising the populace of the main target population. Given that the parameters of the population of ecstasy users were unknown at the time the study was initiated, the combined use of targeted sampling and ethnographic mapping facilitates the development of a more representative sample than one that would have been derived based on convenience sampling. For example, we began our recruitment at raves and clubs that were known for ecstasy use. Ethnographic mapping revealed there to be many other settings of use, such as local coffee shops, local bars, and semi-public gathering spaces such as parks. Similarly, the use of ethnographic mapping led us to less visible ecstasy users, including those who tended to use in private settings. Without the targeted sampling approach, including its ethnographic mapping, these individuals would not have been identified and, therefore, would have been inadvertently excluded from the study sample.

The targeted neighborhoods were chosen because of their concentration of ecstasy users. These communities were “hot spots” of local drug activity characterized by frequent drug sales and widespread drug use. Within these community “hot spots,” the outreach workers targeted places where ecstasy users were known to gather (e.g., clubs, public parks), so as to maximize their recruitment efforts. In addition, passive recruitment was also used to advertise the study and bolster recruitment possibilities. This approach, which accounted for approximately one-quarter of the study participants who eventually enrolled, involved the posting of flyers in local clubs and venues, colleges and universities, coffee shops, and various on-the-street locations.

Prior to conducting interviews, all eligible persons were provided with appropriate information to facilitate the informed consent process. Institutional Review Board approvals for this study and all related research protocols were obtained from Emory University and Georgia State University. On average, interviews took 2 h to complete. Face-to-face interviews were conducted by trained interviewers using a computer-assisted interview (i.e., CASI). At the completion of the interview, people were paid \$25 for their participation.

Measures

A structured questionnaire designed specifically for this study was used for data collection. It was created based on existing validated instruments that are widely known and used in the field (Dennis et al. 1995; McLellan et al. 1985; Needle et al. 1995), as well as on a formative research study conducted by the present authors using a similar population of ecstasy users.

The dependent variable used in this paper’s analyses is a continuous measure assessing the proportion of all sexual acts committed during the preceding 30 days involving the use of condoms or other barrier methods of protection. It is based on the total number of times people reported having vaginal sex, oral sex, and anal sex with a steady partner, with a casual partner, and with someone they had known for less than 24 h. Values ranged from 0 (no protected sex) to 1 (all sexual acts involving the use of protection). These values represented percentages of protected sex (0 = 0% protected sex; 0.35, for example, corresponded to 35% protected sex) and were computed by dividing the total number of

times having protected sex by the total number of times having sex. The median rate of sexual protection was 25.0% and the mean was 35.2% (SD = 36.9).

Several types of predictor variables were considered and included as independent variables in these analyses. All were chosen because of their relevance to the Health Belief Model, the Theory of Reasoned Action, and/or the Theory of Planned Behavior, which are the principal paradigms underlying/guiding this research. The predictor variables used in these analyses also were selected based on published research documenting their relevance to the subject matter at hand.

For example, a number of studies have shown that HIV risk behaviors differ, often quite dramatically, based on demographic characteristics such as race/ethnicity, age, marital status, and homelessness (Newcomb et al. 1998; Smereck and Hockman 1998; Wayment et al. 2003). Accordingly, we examined a number of demographic characteristics, including gender (male vs. female), age (continuous measure), race/ethnicity (Caucasians vs. non-Caucasians), educational attainment (continuous measure), religiosity (continuous scale measure, Cronbach's alpha = 0.75), marital status ("involved" vs. other-than-"involved" persons), employment status (full-time vs. other-than-full-time, and unemployed vs. other-than-unemployed), income (continuous measures for personal and household income), and sexual orientation (coded as heterosexual vs. other-than-heterosexual).

Previous research has also documented a variety of background experiences measures that are also relevant to understanding the extent to which people are involved in risk practices or risk reduction strategies (Beadnell et al. 2000; Stoskopf et al. 2001; Wyatt et al. 2000). Examples of such measures included in the present study were HIV testing history (coded yes/no), mental health diagnosis (coded yes/no), and the number of persons the respondent knew who were HIV-positive or who had AIDS or who had died from AIDS (three continuous measures).

Also included in the present study are several substance use/abuse-related measures, such as living with any substance abusers (coded yes/no), spending time or "hanging out with" substance abusers (coded yes/no), number of alcohol-related problems experienced (continuous scale measure, Cronbach's alpha = 0.83), amount of illegal drug use in past month (continuous measure based on the sum of 13 different types of illegal drugs), ever binging on ecstasy (coded yes/no), doing things to enhance the effects of ecstasy (continuous scale measure, Cronbach's alpha = 0.77), and ever been in drug treatment (coded yes/no). This category of predictors was selected as a result of the extensive body of published research demonstrating the relevance of substance use/abuse and exposure to substance users/abusers to the (non)use of sexual protection (see, for example, Nadeau et al. 2000; Theall et al. 2003).

Finally, we included a number of items pertaining to sexual and relationship characteristics, such as condom use self-efficacy (continuous scale measure, Cronbach's alpha = 0.80), having multiple sexual partners (coded yes/no), supportiveness of one's spouse or main partner (continuous scale measure, Cronbach's alpha = 0.88), and number of sexual partners during past 30 days (continuous measure), in our analyses. These sexual and relationship-related items were chosen because of the extensive body of literature documenting the relevance of interpersonal relationships and the importance of support networks in affecting HIV risk and related protective behaviors (Latkin et al. 2003; Montoya 1998; Sobo 1995).

Analysis

Multiple regression was used to identify relevant predictors of the extent to which study participants engaged in protected sex. Initially, bivariate analyses were conducted to

determine which variables might be related to sexual protection and, therefore, ought to be entered into the multivariate equation. Whenever the predictor variable was dichotomous, Student's *t* tests were used for these bivariate analyses. Whenever the independent variable was categorical in nature or ordinal with fewer than five categories, analysis of variance was used. Whenever the independent variable was continuous in nature, simple regression was used.

Then, items that were found to be statistically significant ($p < 0.050$) predictors in these bivariate analyses were selected for entry into the multivariate prediction model. To ensure that the order in which items were considered for inclusion in the development of the final multivariate equation did not influence the results obtained, the analyses were conducted using a stepwise forward selection procedure and a backward elimination procedure. The same results were obtained in the final model regardless of which approach was adopted. Throughout all of these analyses, results are reported as statistically significant whenever $p < 0.050$.

Results

Sample description

Most study participants were male (70.0%), married or romantically “involved” with someone (58.4%), and either Caucasian (49.8%) or African American (37.1%). Respondents' mean age was 20.9 (SD = 2.3). Overall, this was a fairly well-educated sample of young adults, with 38.2% of the study participants reporting having had at least some college. In contrast, employment rates in this study population were relatively low, with most persons saying that they were either unemployed (25.4%) or employed on a part-time basis (30.4%) at the time of their interview. Most of the respondents in this study (78.8%) self-identified as being heterosexual, although a sizable proportion (21.2%) said that they were gay, lesbian, or bisexual.

Main findings

A sizable proportion of the sexually active study participants (38.2%) said that they had not engaged in protected sex at all during the preceding month. Conversely, a smaller proportion (14.5%) said that they practiced safe sex every time they had had sexual relations during the previous month. On average, 35.2% of all sexual acts reported by members of this research sample were protected.

This raised the question of what factors were associated with the greater/lesser practice of engaging in protected sexual relations. The bivariate analyses revealed numerous variables differentiating the use of condoms (see Table 1). In terms of the demographic variables examined, we discovered that greater condom use was reported by non-Caucasians compared to Caucasians ($p < 0.001$), “involved” persons versus those who were not in a romantic relationship ($p < 0.001$), and those earning less money compared to those whose income was greater ($p < 0.050$). Of the various background/experiences measures studied, we found only one difference: More condom use was reported among people who had never been diagnosed with a mental health problem than among those who had ($p < 0.010$). Of the various substance use-related measures examined, only one was found to be associated with the rate of sexual protection in this population: People who reported having binged on ecstasy at least once in their lives reported lower rates of condom use than those who had never binged on this drug ($p < 0.010$). One other measure—doing things to enhance one's ecstasy high—was marginally related to condom use ($p < 0.100$), such that the more high-enhancing behaviors people practiced, the less frequently they reported using condoms. Similarly, respondents who had been in drug treatment previously reported somewhat lower

rates of condom use than those who had never been in treatment before ($p < 0.100$). Of the sexual and relationship characteristics measures examined, we discovered that greater condom use was reported by people who reported the highest levels of condom use self-efficacy ($p < 0.001$) and those who had had multiple sex partners during the recent past ($p < 0.001$).

Five of these items were found to be statistically significant predictors when the multivariate analysis was conducted, and together, they explained 22.3% of the variance. First, Caucasians reported much lower rates of protected sex than non-Caucasians did (25.6 vs. 44.1%, $\beta = 0.20$, $p < 0.010$). Second, people who were involved with a partner (i.e., married, engaged, seriously dating) reported lower rates of condom use than did their peers who were not involved with someone (27.8 vs. 49.8%, $\beta = 0.17$, $p < 0.010$). Third, as income increased, the rate of protected sex decreased ($\beta = 0.16$, $p < 0.010$). Fourth, people who had had sex with more than one person during the previous month reported higher rates of sexual protection than those who had had sex with only one person during that interval (47.0 vs. 28.5%, $\beta = 0.14$, $p < 0.050$). Finally, as condom use self-efficacy increased, the rate of sexual protection increased as well ($\beta = 0.26$, $p < 0.001$).

Discussion

Before discussing our main conclusions, we would like to acknowledge three potential limitations of this research. First, the data collected as part of this study of young adult ecstasy users were all based on uncorroborated self-reports. Therefore, the extent to which respondents underreported or overreported their involvement in risky behaviors is unknown. In all likelihood, the self-reported data can be trusted, as numerous authors have noted that persons in their research studies (which, like the present study, have included fairly large numbers of substance abusers) have provided accurate information about their behaviors (Anglin et al. 1993; Higgins et al. 1995; Jackson et al. 2004; Nurco 1985).

A second possible limitation pertains to recall bias. Respondents were asked to report about their beliefs, attitudes, and behaviors during the past 30 days, the past 90 days, and the past year, depending upon the measure in question. These time frames were chosen specifically (1) to incorporate a large enough amount of time in the risk behavior questions' time frames so as to facilitate meaningful variability from person to person, and (2) to minimize recall bias. The exact extent to which recall bias affected the data cannot be assessed although other researchers collecting data similar to that captured in this study have reported that recall bias is sufficiently minimal that its impact upon study findings is likely to be small (Jaccard and Wan 1995).

A third possible limitation of these data comes from the sampling strategy used. All interviews were conducted in the Atlanta, Georgia metropolitan area. There may very well be local or regional influences or subcultural differences between these women and those residing elsewhere that could affect the generalizability of the data. Additionally, the targeted sampling and ethnographic mapping approaches used for deriving this study's research sample are not random. We do believe, however, that these approaches provide an optimal way of deriving appropriate research samples for studies such as the present one, in which the parameters (e.g., size, location, demographic characteristics) of hidden populations are unknown. Moreover, the chain referral sampling approach used to identify study participants is not a random sampling strategy, and there may be inherent biases in who was/not identified as potential study participants in this research. A good discussion of the issues pertinent to this issue may be found in Heckathorn (1997), along with strategies that can be employed to minimize any bias that could result from the use of a chain-referral sampling approach.

Despite these possible—and, we contend, minimal—limitations, we believe that many interesting and important findings came about in the present study. First, we found that people who were involved in a relationship with someone used condoms less often than those who were not similarly involved. Other researchers as well have reported that condom use tends to be less consistent among persons who are “involved” than it is among those who are not (Lauby et al. 2000; Thomas et al. 1999). Usually, this practice of not using condoms on a consistent basis is attributed to feelings of health-related safety and trust among persons in relationships, and to a lesser extent to the desire to conceive a child among some couples. For many persons, this sense of security is, indeed, real and can negate the need for consistent condom usage, as would be the case when both partners are HIV-negative (and free of other sexually transmitted infections as well) and monogamous with one another.

For many drug users, though, this sense of security is merely illusory, as rates of relationship infidelity tend to be high in this population. For example, in another community-based study that we recently conducted in the Atlanta metropolitan area, the present authors found relationship infidelity rates to approach 95% among the drug users sampled and/or their main partner(s) (Klein et al. 2004). In the present study of young adult ecstasy users, nearly one-quarter (23.5%) of the study participants who said that they were involved with someone also said that they had had sex with more than one person during the preceding 30 days and more than one-third of them (35.2%) said that they had had sexual relations with someone who was not their steady partner during that time period. These findings of nonmonogamy among persons who consider themselves to be involved with a steady partner indicate a need for intervention efforts to target ecstasy users who are married or in other types of marital-type relationships, particularly those who believe that they do not need to use condoms with their partners principally because they are “involved” (hence presumed—falsely presumed, we would point out—to be safe). These educational and intervention efforts are most likely to be effective if they can enlist the cooperation and involvement of both partners in the couple, as published studies have shown that couples-oriented HIV interventions are quite successful with respect to reducing sexual risk (El-Bassel et al. 2001). A number of authors have discussed the potential benefits of couples-oriented HIV educational programs and the need for HIV interventions to target both members of sexually involved couples (Polacsek et al. 1999; Sherman and Latkin 2001; Wells et al. 1994).

Second, we found that greater rates of condom use were reported among persons who had more than one sexual partner during the preceding month than among those who reported monogamy during that period. To a limited extent, that is good news, since it shows an effort on the part of persons who have sex with more than one other person to protect themselves and their partners from HIV and other sexually transmitted infections. The bad news, however, is that even among those with multiple partners, sexual protection rates were relatively low in this sample, accounting for fewer than half (47.0%) of all sexual acts. Even among persons who reported the largest number of sexual partners during the preceding month—those with 4 or more partners—sexual protection rates barely exceeded the halfway mark (53.1%). Clearly, young adult ecstasy users need to be reminded of the importance of protecting themselves and their partners during all (vs. merely some) of their sexual encounters. HIV interventionists working with this population must bear in mind that a heightened sense of touch and an increased desire for physical and sexual contact are common effects of ecstasy use (Ross et al. 2003; Theall et al. 2006), thereby rendering users of this drug particularly vulnerable to HIV risk practices while they are under the influence of ecstasy. Teaching ecstasy users about specific strategies that they can employ vis-a-vis condom use while they are high on this drug is simultaneously important (to keep users safe from HIV) and difficult, since drug abuse typically impairs rational decision-making processes of the type that are necessary to reduce HIV-related risks.

Two of our main findings came somewhat as a surprise to us—namely, that Caucasian study participants demonstrated lower rates of sexual protection than non-Caucasians did, and that there was an inverse relationship between income and condom use in this sample. The race-related finding was surprising in light of recent national trends showing upsurges in the rate of HIV transmission among racial minority group members, particularly African Americans (Centers for Disease Control and Prevention 2004). The income-related finding was unexpected because previously published studies have shown greater rates of HIV risk behaviors (Crosby et al. 2002; Grimley et al. 2004) and lower levels of HIV-/AIDS-related knowledge among lower-income persons (Herek et al. 2005; Sweat and Levin 1995). Although we do not know for certain what accounts for these two findings, one idea seems plausible to us: Perhaps as a result of public education and media campaigns designed to inform the general public about HIV, some Caucasians and upper-income individuals have begun to think of themselves as being less vulnerable (perhaps even invulnerable) to HIV. That is, with recent trends in the HIV/AIDS statistics showing that African Americans are contracting HIV at greater rates than ever before and with rapid increases also being witnessed in the Latino community (Centers for Disease Control and Prevention 2004), and with much of the HIV/AIDS-related media attention focusing on these groups' elevated risk for acquiring HIV, it is possible that some Caucasians who have heard such media messages are dismissing (or at the very least minimizing to themselves) their own personal risk for HIV. Likewise, much of the coverage that HIV and AIDS get in the media nowadays focuses on disadvantaged persons, and that might (inadvertently) be leading people of greater financial means to believe that their chances of acquiring HIV are smaller than they really are.

If, indeed, this interpretation is correct, then it speaks to a need for HIV interventionists to find ways to elevate people's perceived risk for acquiring HIV to a level that is on par with their actual risk practices. People who do not consider themselves to be at risk for HIV are unlikely to take the steps necessary to protect themselves—a fact that is borne out by published research (Belcher et al. 2005; DeVisser 2004; Klein et al. 2003; Morrison-Beedy et al. 2001). Practitioners working with young adult ecstasy users might wish to conduct risk assessments with their clients, and then provide them with educational sessions informing them about their overall levels of HIV-related risk and about the specific steps they can take to reduce their risk level.

Finally, we discovered a direct relationship between condom use self-efficacy and actual condom use. This finding has been reported numerous times (see, for example, Lindberg 2000; Posner et al. 2001), including studies based on drug-abusing populations (Sagrestano et al. 2005; Sterk et al. 2003). It highlights the need for HIV intervention projects targeting ecstasy users to work with these individuals to improve their skills with respect to bringing about consistent, correct condom use with their sexual partners. Many approaches could be used to accomplish this. For example, teaching ecstasy users how to negotiate safer sex with their partners, particularly via role-playing activities designed to teach them how to convince reluctant partners to use condoms, is likely to be an effective way of accomplishing this. Numerous published studies support the merit of this approach (see, for example, Boyer et al. 1997; Hoffman et al. 1999; Kelly et al. 1994). As another example, introducing people to the female condom and educating them about its use may be another effective way to help people—particularly women—gain confidence in their ability to engage in safer sexual practices. To date, most studies on people's experiences with the female condom have reported favorable results (Klein et al. 1999; Shervington 1993; Van Deventer et al. 2002), highlighting the value of this device as an intervention tool to elevate condom use self-efficacy. Educating ecstasy users how to use condoms correctly by teaching them proper condom inspection and application skills (e.g., check for expiration date, how to open a condom wrapper without damaging the condom, how to put on and remove a condom to

reduce the risk of spillage, etc.) would also be an important strategy to enhance condom use self-efficacy. Other researchers have commented upon the need to teach young adults how to use condoms correctly (Crosby et al. 2003; DeVisser 2004), and some programs that have evaluated the effectiveness of providing condom application skills training have shown positive results (Eldridge et al. 1997; Elkins et al. 1998).

Acknowledgments

This research was supported by a grant from the National Institute on Drug Abuse (R01-DA014232).

References

- Anglin MD, Hser Y, Chou C. Reliability and validity of retrospective behavioral self-report by narcotics addicts. *Eval Rev.* 1993; 17:91–103.
- Beadnell B, Baker SA, Morrison DM, Knox K. HIV/STD risk factors for women with violent male partners. *Sex Roles.* 2000; 42:661–689.
- Belcher L, Sternberg MR, Wolitski RJ, Halkitis P, Hoff C. Condom use and perceived risk of HIV transmission among sexually active HIV-positive men who have sex with men. *AIDS Educ Prev.* 2005; 17:79–89. [PubMed: 15843112]
- Boeri MW, Sterk CE, Elifson KW. Rolling beyond raves: ecstasy use outside the rave setting. *J Drug Issues.* 2004; 34:831–860.
- Boyer CB, Barrett DC, Peterman TA, Bolan G. Sexually transmitted disease and HIV risk in heterosexual adults attending a public STD clinic: evaluation of a randomized controlled behavioral risk-reduction intervention trial. *AIDS.* 1997; 11:359–367. [PubMed: 9147428]
- Buchert R, Thomasius R, Wilke F, Petersen K, Nebeling B, Obrocki J, Schulze O, Schmidt U, Clausen M. A voxel-based PET investigation of the long-term effects of “ecstasy” consumption on brain serotonin transporters. *Am J Psychiatry.* 2004; 161:1181–1189. [PubMed: 15229049]
- Buffum J, Moser C. MDMA and human sexual function. *J Psychoactive Drugs.* 1986; 18:355–359. [PubMed: 2880951]
- Centers for Disease Control and Prevention. HIV/AIDS surveillance report 2003. 2004; vol 15:1–46.
- Crosby RA, Yarber WL, DiClemente RJ, Wingood GM, Meyerson B. HIV-associated histories, perceptions, and practices among low-income African American women: Does rural residence matter? *Am J Public Health.* 2002; 92:655–659. [PubMed: 11919067]
- Crosby RA, Sanders S, Yarber WL, Graham CA. Condom-use errors and problems: a neglected aspect of studies assessing condom effectiveness. *Am J Prev Med.* 2003; 24:367–370. [PubMed: 12726876]
- Dennis, ML.; Rourke, KM.; Lucas, RL.; Zien, C., et al. Global appraisal of individual needs (GAIN): resource manual. Research Triangle Park, NC; 1995.
- DeVisser R. Delayed application of condoms, withdrawal and negotiation of safer sex among heterosexual young adults. *AIDS Care.* 2004; 16:315–322. [PubMed: 15203425]
- El-Bassel N, Witte SS, Gilbert L, Sormanti M, Moreno C, Pereira L, Elam E, Steinglass P. HIV prevention for intimate couples: a relationship-based model. *Fam Syst Health.* 2001; 19:379–395.
- Eldridge GD, St. Lawrence JS, Little CE, Shelby MC, et al. Evaluation of an HIV risk reduction intervention for women entering inpatient substance abuse treatment. *AIDS Educ Prev.* 1997; 9:62–76. [PubMed: 9083599]
- Elkins DB, Dole LR, Maticka-Tyndale E, Stam KR. Relaying the message of safer sex: Condom races for community-based skills training. *Health Educ Res.* 1998; 13:357–370. [PubMed: 10186448]
- Grimley DM, Hook EW III, DiClemente RJ, Lee PA. Condom use among low-income African American males attending an STD clinic. *Am J Health Behav.* 2004; 28:33–42. [PubMed: 14977157]
- Heckathorn DD. Respondent-driven sampling: a new approach to the study of hidden populations. *Soc Probl.* 1997; 44:174–199.
- Herek GM, Widaman KF, Capitanio JP. When sex equals AIDS: Symbolic stigma and heterosexual adults’ inaccurate beliefs about sexual transmission of AIDS. *Soc Probl.* 2005; 52:15–37.

- Higgins ST, Budney AJ, Bickel WK, Badger GJ, Foerg FE, et al. Outpatient behavioral treatment for cocaine dependence: One-year outcome. *Exp Clin Psychopharmacol*. 1995; 3:205–212.
- Hoffman JA, Klein H, Crosby H, Clark DC. Project neighborhoods in action: an HIV-related intervention project targeting drug abusers in Washington, DC. *J Urban Health*. 1999; 76:419–434. [PubMed: 10609592]
- Jaccard J, Wan CK. A paradigm for studying the accuracy of self-reports of risk behavior relevant to AIDS: empirical perspectives on stability, recall bias, and transitory influences. *J Appl Soc Psychol*. 1995; 25:1831–1858.
- Jackson CT, Covell NH, Frisman LK, Essock SM. Validity of self-reported drug use among people with co-occurring mental health and substance use disorders. *J Dual Diagn*. 2004; 1:49–63.
- Kelly JA, Murphy DA, Washington CD, Wilson TS, Koob JJ, Davis DR, Ledezma G, Davantes B. The effects of HIV/AIDS intervention groups for high-risk women in urban clinics. *Am J Public Health*. 1994; 84:1918–1922. [PubMed: 7998630]
- Klein H, Eber M, Crosby H, Welka DA, Hoffman JA. The acceptability of the female condom among substance-using women in Washington, DC. *Women Health*. 1999; 29:97–114. [PubMed: 10466513]
- Klein H, Elifson KW, Sterk CE. “At risk” women who think that they have no chance of getting HIV: self-assessed perceived risks. *Women Health*. 2003; 38:47–63. [PubMed: 14655794]
- Klein, H.; Elifson, K.; Sterk, C. Predictors of unsafe sex among “at risk” women; Washington DC. Paper presentation at the annual meeting of the American Public Health Association; Nov. 2004 p. 6-10.
- Klitzman RL, Pope HG Jr. MDMA (“ecstasy”) abuse and high-risk sexual behaviors among 169 gay and bisexual men. *Am J Psychiatry*. 2000; 157:1162–1164. [PubMed: 10873928]
- Klitzman RL, Greenberg JD, Pollack LM, Dolezal C. MDMA (“ecstasy”) use and its association with high risk behaviors, mental health, and other factors among gay/bisexual men in New York City. *Drug Alcohol Depend*. 2002; 66:115–125. [PubMed: 11906799]
- Latkin CA, Sherman S, Knowlton A. HIV prevention among drug users: outcome of a network-oriented peer outreach intervention. *Health Psychol*. 2003; 22:332–339. [PubMed: 12940388]
- Lauby JL, Stark M, Person B, Adams J, Smith PJ. A community-level HIV prevention intervention for inner-city women: results of the women and infants demonstration projects. *Am J Public Health*. 2000; 90:216–222. [PubMed: 10667182]
- Lee SJ, Galanter M, Dermatis H, McDowell D. Circuit parties and patterns of drug use in a subset of gay men. *J Addict Dis*. 2003; 22:47–60. [PubMed: 14723477]
- Lindberg CE. Knowledge, self-efficacy, coping, and condom use among urban women. *J Assoc Nurses AIDS Care*. 2000; 11:80–90. [PubMed: 11022334]
- Mattison AM, Ross MW, Wolfson T, Franklin D. Circuit party attendance, club drug use, and unsafe sex in gay men. *J Subst Abuse*. 2001; 13:119–126. [PubMed: 11547613]
- McLellan AT, Luborsky L, Cacciola J, Griffin J, et al. New data from the addiction severity index: reliability and validity in three centers. *J Nerv Ment Dis*. 1985; 173:412–423. [PubMed: 4009158]
- Montoya ID. Social network ties, self-efficacy, and condom use among women who use crack cocaine: a pilot study. *Subst Use Misuse*. 1998; 33:2049–2073. [PubMed: 9744842]
- Montoya AG, Sorrentino R, Lukas SE, Price BH. Long-term neuropsychiatric consequences of “ecstasy” (MDMA): a review. *Harv Rev Psychiatry*. 2002; 10:212–220. [PubMed: 12119307]
- Morrison-Beedy D, Carey MP, Lewis BP, Aronowitz T. HIV risk behavior and psychological correlates among Native American women: an exploratory investigation. *J Women’s Health Gend Based Med*. 2001; 10:487–494. [PubMed: 11445048]
- Nadeau L, Truchon M, Biron C. High-risk sexual behaviors in a context of substance abuse: a focus group approach. *J Subst Abuse Treat*. 2000; 19:319–328. [PubMed: 11166496]
- National Institute on Drug Abuse. Ecstasy: what we know and don’t know about MDMA. Rockville, MD: National Institute on Drug Abuse; 2001.
- Needle R, Fisher DG, Weatherby N, Chitwood D, et al. Reliability of self-reported HIV risk behaviors of drug users. *Psychol Addict Behav*. 1995; 9:242–250.

- Newcomb MD, Wyatt GE, Romero GJ, Tucker MB, Wayment HA, Carmona JV, Solis B, Mitchell-Kernan C. Acculturation, sexual risk taking, and HIV health promotion among Latinas. *J Couns Psychol.* 1998; 45:454–467.
- Nurco, DN. A discussion of validity: self-report methods of estimating drug use. NIDA Research Monograph #57. Washington, DC: U.S. Government Printing Office; 1985. p. 4-11.
- Polacek M, Celentano DD, O'Campo P, Santelli J. Correlates of condom use stage of change: implications for intervention. *AIDS Educ Prev.* 1999; 11:38–52. [PubMed: 10070588]
- Posner SF, Pulley LV, Artz L, Cabral R, Macaluso M. Psychosocial factors associated with self-reported male condom use among women attending public health clinics. *Sex Transm Dis.* 2001; 28:387–393. [PubMed: 11460022]
- Ross MW, Mattison AM, Franklin DR Jr. Club drugs and sex on drugs are associated with different motivations for gay circuit party attendance in men. *Subst Use Misuse.* 2003; 38:1173–1183. [PubMed: 12901454]
- Sagrestano LM, Rogers A, Kittleson MJ, Sarvela PD. Does efficacy mediate stage of change and condom use in injected drug users? *Am J Health Behav.* 2005; 29:12–24. [PubMed: 15604047]
- Sherman SG, Latkin CA. Intimate relationship characteristics associated with condom use among drug users and their sex partners: a multilevel analysis. *Drug Alcohol Depend.* 2001; 64:97–104. [PubMed: 11470345]
- Shervington DO. The acceptability of the female condom among low-income African-American women. *J Natl Med Assoc.* 1993; 85:341–347. [PubMed: 8496987]
- Smereck GAD, Hockman EM. Prevalence of HIV infection and HIV risk behaviors associated with living place: on-the-street homeless drug users as a special target population for public health intervention. *Am J Drug Alcohol Abuse.* 1998; 24:299–319. [PubMed: 9643467]
- Sobo EJ. Finance, romance, social support, and condom use among impoverished inner-city women. *Hum Organ.* 1995; 54:115–128.
- Sterk C. Building bridges: community involvement in HIV and substance abuse research. *Drugs Soc.* 1999; 14:107–121.
- Sterk CE, Klein H, Elifson KW. Perceived condom use self-efficacy among at-risk women. *AIDS Behav.* 2003; 7:175–182. [PubMed: 14586202]
- Sterk CE, Theall KP, Elifson KW. Young adult ecstasy use patterns: quantities and combinations. *J Drug Issues.* 2006; 36:201–228.
- Stoskopf CH, Kim YK, Glover SH. Dual diagnosis: HIV and mental illness, a population-based study. *Community Ment Health J.* 2001; 37:469–479. [PubMed: 11504140]
- Sweat MD, Levin M. HIV/AIDS knowledge among the U.S. population. *AIDS Educ Prev.* 1995; 7:355–375. [PubMed: 7577310]
- Theall KP, Sterk CE, Elifson KW. Male condom use by type of relationship following an HIV intervention among women who use illegal drugs. *J Drug Issues.* 2003; 33:1–28.
- Theall KP, Elifson KW, Sterk CE. Sex, touch, and HIV risk among ecstasy users. *AIDS Behav.* 2006; 10:169–178. [PubMed: 16456728]
- Thomas JC, Weiner DH, Earp JA, Schoenbach VS, Lansky A. Behaviors that facilitate sexual transmission of HIV and STDs in a rural community. *AIDS Behav.* 1999; 3:257–267.
- Van Deventer N, Gonzales V, Merzel C, Parikh NS, Celantano D, Greenberg J. Effect of an STD/HIV behavioral intervention on women's use of the female condom. *Am J Publ Health.* 2002; 92:109–115.
- Verheyden SL, Henry JA, Curran HV. Acute, sub-acute, and long-term subjective consequences of 'ecstasy' (MDMA) consumption in 430 regular users. *Hum Psychopharmacol.* 2003; 18:507–517. [PubMed: 14533132]
- Watters J, Biernacki P. Targeted sampling: Options for the study of hidden populations. *Soc Probl.* 1989; 36:416–430.
- Wayment HA, Wyatt GE, Tucker MB, Romero GJ, Carmona JV, Newcomb M, Solis BM, Riederle M, Mitchell-Kernan C. Predictors of risky and precautionary sexual behaviors among single and married white women. *J Appl Soc Psychol.* 2003; 33:791–816.

- Wells EA, Clark LL, Calsyn DA, Saxon AJ, Jackson TR, Wrede AF. Reporting of HIV risk behaviors by injection drug using heterosexual couples in methadone maintenance. *Drug Alcohol Depend.* 1994; 36:33–38. [PubMed: 7988357]
- Wyatt GE, Carmona JV, Loeb TB, Guthrie D, Chin D, Gordon G. Factors affecting HIV contraceptive decision-making among women. *Sex Roles.* 2000; 42:495–521.
- Zemishlany Z, Aizenberg D, Weizman A. Subjective effects of MDMA (“ecstasy”) on human sexual function. *Eur Psychiatry.* 2001; 16:127–130. [PubMed: 11311178]

Table 1

Bivariate analysis results for engaging in protected sex

	% Protected sex	<i>p</i> < <i>x</i>
Demographic characteristic		
Gender		n.s.
Male	36.6	
Female	32.0	
Age (continuous)		n.s.
Race/ethnicity		0.001
Caucasian	25.6	
Non-Caucasian	44.1	
Relationship status		0.001
Involved	27.8	
Not involved	49.8	
Educational attainment (continuous)		n.s.
Employment status		n.s.
Employed full-time	37.8	
Not employed full-time	34.4	
Income (continuous)		0.050
Sexual orientation		n.s.
Heterosexual	36.4	
Other than heterosexual	30.3	
Background experiences measures		
HIV testing history		n.s.
No	34.9	
Yes	35.3	
Mental health diagnosis		0.010
No	39.1	
Yes	21.0	
Number of persons known to the respondent who:		
were HIV-positive		n.s.
had "full-blown" AIDS		n.s.
had died from AIDS		n.s.
Substance use/abuse-related measures		
Living with any substance abusers		n.s.
No	42.3	
Yes	33.5	
Spending time with/"hanging out with" substance abusers		n.s.
No	47.7	
Yes	34.8	
Number of alcohol-problems experienced (continuous)		0.050
Amount of illegal drug use in past month (continuous)		0.001

	% Protected sex	$p < \alpha $
Ever binged on ecstasy		0.010
No	38.6	
Yes	25.0	
Doing things to enhance the effects of ecstasy (continuous)		0.100
Ever been in drug treatment		0.100
No	37.5	
Yes	27.9	
Sexual and relationship characteristics		
Condom use self-efficacy (continuous)		0.001
Had multiple sex partners in past month		0.001
No	28.5	
Yes	47.0	
Level of supportiveness of spouse/main partner (continuous)		0.001
Number of sex partners in past month (continuous)		0.010