

# A Longitudinal Investigation of Powder Cocaine Use Among Club-Drug Using Gay and Bisexual Men\*

JOSEPH J. PALAMAR, M.A., M.P.H.,<sup>†</sup> PREETIKA P. MUKHERJEE, PH.D., AND PERRY N. HALKITIS, PH.D.

*Center for Health, Identity, Behavior and Prevention Studies, The Steinhardt School of Culture, Education, and Human Development, New York University, 726 Broadway, Suite 525, New York, New York 10003*

**ABSTRACT. Objective:** Few studies have analyzed the use of powder cocaine over time and its relation to psychosocial states. The purpose of the present analysis was to examine trajectories of powder cocaine use among club-drug using gay and bisexual men in New York City. **Method:** A purposive sample of 355 powder cocaine using men was surveyed four times over a period of 12 months. We analyzed natural trajectories of cocaine use and examined use in relation to demographic and psychosocial variables. Hierarchical linear modeling was used to examine associations of use at baseline and over time. **Results:** Frequency of use at baseline

was negatively related to sexual sensation seeking and positively related to triggers of unpleasant emotions, physical discomfort, and the desire for pleasant times with others. Men who reported using cocaine to avoid physical discomfort or to enhance pleasant times with others were also more likely to decrease their frequency of use during the yearlong investigation. **Conclusions:** The antecedents that explained cocaine use in this sample indicate the need for treatment and prevention programs that consider the interplay between emotions and behaviors related to use of this drug. (*J. Stud. Alcohol Drugs* 69: 806-813, 2008)

COCAINE USE HAS REMAINED a public health issue in the United States for more than a century. This substance is the most prevalent illicit drug used in the United States aside from marijuana and illegally obtained prescription drugs and is involved in more emergency department visits than any other illicit drug (Substance Abuse and Mental Health Services Administration, 2007a,b). Although cocaine use remains prevalent across segments of the population, its use is particularly high among certain subpopulations, including gay and bisexual men (Lee et al., 2003; Mattison et al., 2001).

Unlike many other recreational drugs (e.g., ecstasy, ketamine), cocaine use is ubiquitous, particularly in New York City (Community Epidemiology Work Group, 2006), where it is used in many different venues, including private residences, bars, concerts, nightclubs, and circuit parties (Lee et al., 2003; Mattison et al., 2001; Riley et al., 2001). In addition, cocaine is used across a wide range of ages (Johnston et al., 2007; White and Bates, 1995). With regard to race, white men are more likely to use than their nonwhite counterparts; however, white users are more likely to decrease use over time (Braun et al., 1996). Black men are more likely to report increased cocaine use over time; however, this use tends to be in the form of crack cocaine.

There is an abundance of literature describing the behavioral, psychosocial, and pharmacological aspects of cocaine

use, but most literature does not differentiate between powder cocaine and crack cocaine, which is a smokable rock form of the substance. This lack of clarity often leads to ambiguous findings, because crack cocaine differs greatly from powder cocaine with respect to speed of delivery and reinforcing effects, user demographics, and psychosocial reasons for use (Chen and Anthony, 2004; Gossop et al., 2006; Nabben and Korf, 1999). Powder cocaine use is also more strongly associated with alcohol consumption (Gossop et al., 2006), which may further facilitate social lubrication.

Powder cocaine (herein referred to as "cocaine") is used, in part, for social reasons. Users tend to navigate social circles of friends or colleagues that include other cocaine users (De Micheli and Formigoni, 2004; Riley et al., 2001). Use has previously been tied to social pressure (Perry and Mandell, 1995), and level of consumption has been tied to use for pleasant times with others (Waldrop et al., 2007). Although cocaine use is related to nightlife socialization, cocaine users, however, are less integrated with regard to other social institutions outside of nightlife scenes, such as family and religious communities (Mugford, 1994). This may be especially true for gay men, who experience marginalization from familial and religious structures (Herek, 2006). Heterosexuals tend to cease use of cocaine after marriage and/or having children (White and Bates, 1995), but little is known about use over time among their gay and bisexual counterparts. Thus it is important to examine whether gay and bisexual men use this substance as a result of social realities in their lives.

Cocaine use is also related to numerous psychological antecedents, including depression, anxiety, and hostility (Fox et al., 2005; Helmus et al., 2001; Kasarabada et al.,

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<sup>†</sup>Correspondence may be sent to Joseph J. Palamar, 215 Lexington Avenue, 14th Floor, New York, NY 10016 or via email at: jip250@nyu.edu.

1998; Patkar et al., 2002). Chronic cocaine use often leads to depression, particularly when use progresses quickly over time (Kasarabada et al., 1998); however, depression also sometimes precedes the use of this substance (Latkin and Mandell, 1993). Furthermore, depression is linked to cocaine withdrawal, which further exacerbates these recurring negative emotions (Helmus et al., 2001). Depression in relation to cocaine use is complex and circular; therefore, further research is needed to examine how depression relates to use over time.

Few studies have documented anxiety as a potential reason for cocaine use. Use has been linked to anxiety disorders (Sareen et al., 2006), and cocaine users differ in terms of anxiety personality traits in comparison with their non-using counterparts (Rosseli and Ardila, 1996). Anxiety is also highly associated with cocaine craving, particularly among frequent users (Fox et al., 2005). Like depression, anxiety in relation to cocaine use is a complex phenomenon and requires further investigation.

Aggression also has also been documented as being an antecedent to cocaine use (Ensminger et al., 2002), but, like anxiety, the majority of research describes current, not antecedent, aggression in relation to use of this substance. Aggression appears to be related to a heavier frequency of use as well as dependence (Kasarabada et al., 1998; Patkar et al., 2002), but further evidence is needed to determine how these psychological conditions may relate to cocaine use over time. Associations between cocaine use and negative emotions are very complex; thus is it important to consider additional variables to assess selected emotions that are direct triggers to use.

Numerous investigations have also examined cocaine use in relation to sensation seeking. Sensation seekers, characterized by a need for "varied, novel and complex sensations" (Zuckerman, 1979, p. 10), tend to be attracted to stimulants such as cocaine (Gerra et al., 2004). Sensation-seeking motivations are also a factor related to relapse in dependent individuals (Kasarabada et al., 1998). There are many forms of sensation seeking, but one relatively underexplored aspect is that of sexual sensation seeking. This is important to examine because past research findings connect cocaine use to risky sexual intercourse, particularly among gay and bisexual men (Benotsch et al., 1999). Currently, with "meth-sex" (Halkitis et al., 2001, 2008) being popular among drug using gay men, it is crucial to investigate how cocaine use may be related to sexual sensation seeking as well.

For this analysis, we hypothesize that cocaine use among gay and bisexual men is a multifaceted behavior that is triggered by psychosocial factors. In particular, we believe that cocaine use is directly tied to use for social reasons. Currently, there is a lack of literature derived from longitudinal investigations that examine individual use trajectories of cocaine and their associations. Clinical trials are frequently conducted to test the efficacy of treatment of problematic

or chronic use, but further literature is needed to gain a better understanding of how users in nontreatment settings naturally evolve over time. Research limited to problematic use (i.e., dependence) is overrepresented in the literature and thus limits the generalizability of findings. Moreover, further investigation is needed to gain a better understanding of cocaine use among gay and bisexual men because they differ in many aspects from their heterosexual counterparts who have traditionally been the focus of longitudinal analyses. Thus this current investigation examines a large sample of club-drug using gay and bisexual men in New York City over a period of 12 months. The goals of this analysis are (1) to describe the yearlong patterns of powder cocaine use and (2) to delineate factors that explain these patterns over time.

## Method

### *Design and procedure*

Project BUMPS (Boys Using Multiple Party Substances), funded by the National Institute on Drug Abuse, was a longitudinal, mixed methodologies investigation of 450 club-drug using gay and bisexual men in New York City. Participants were assessed through four waves of data collection over the course of 1 year (baseline and 4, 8, and 12 months post-baseline). The purpose of this investigation was to examine the frequency of club-drug use over time, psychological and behavioral correlates of use, and behaviors associated with use. The Institutional Review Board of New York University approved the protocol for this study.

Recruitment occurred from February 2001 through October 2002 using active and passive techniques at venues frequented by gay and bisexual men. Interested respondents were screened for eligibility via telephone interview. (For a detailed description of recruitment response rates, see Halkitis et al., 2007). Eligibility requirements included (1) being 18 years of age or older, (2) self-identifying as gay or bisexual, (3) reporting at least six instances of club-drug use in the year before phone assessment, and (4) reporting at least one instance of use in combination with sex in the past 3 months. Using "club drugs" on at least six occasions is considered consistent use in this population (Halkitis and Parsons, 2002). For the purposes of our study, club drugs were defined as ecstasy (3,4-methylenedioxymethamphetamine [MDMA]), ketamine, gamma-hydroxybutyrate (GHB), methamphetamine, and powder cocaine. Respondents who reported more than five uses of crack cocaine or heroin in the previous year were excluded because these substances are less associated with "party" settings and are more associated with social exclusion (Nabben and Korf, 1999). Those who met eligibility requirements were scheduled for a baseline interview. At baseline assessment, participants gave their informed consent and were administered a quantitative assessment via audio computer-assisted self-interviewing

(ACASI; Gribble et al., 2000), in which each participant listened to assessment questions read through headphones and simultaneously read and answered items on the computer screen by clicking a mouse. HIV status was confirmed using OraSure testing (OraSure Technologies, Bethlehem, PA) for those who reported a seronegative or unknown serostatus. HIV-positive participants were asked to provide evidence of their status (i.e., physician's note). Participants were compensated for completing each assessment: \$30, \$35, \$40, and \$50, respectively.

### Measures

*Cocaine use.* Participants reported the frequency of days cocaine was used during the 4 months before each assessment (baseline and Months 4, 8, and 12).

*Sociodemographics.* Participants were asked to report their age, race/ethnicity, sexual orientation, and educational attainment at baseline. As previously mentioned, HIV status was confirmed.

*Psychological states.* The anxiety ( $\alpha = .86$ ), hostility ( $\alpha = .82$ ), and depression ( $\alpha = .89$ ) subscales of the Brief Symptom Inventory (BSI; Derogatis and Melisaratos, 1983) were administered at baseline assessment. We also assessed three dimensions of sensation seeking. Drug-use sensation seeking was assessed through the Substance Use Seeking Scale (Kalichman et al., 1996) ( $\alpha = .83$ ). Sexual ( $\alpha = .83$ ) and general sensation seeking ( $\alpha = .83$ ) were assessed based on instruments developed by Kalichman and colleagues (Kalichman et al., 1994; Kalichman and Rompa, 1995).

*Reasons for cocaine use.* We also included five subscales from the Inventory of Drug-Taking Situations (Annis and Martin, 1985): cocaine use to avoid unpleasant emotions (e.g., boredom, loneliness;  $\alpha = .96$ ), cocaine use to avoid physical discomfort (e.g., to lose weight, to stay awake or be more energetic;  $\alpha = .70$ ), cocaine use for pleasant times with others (e.g., to celebrate;  $\alpha = .81$ ), cocaine use to avoid conflict with others (e.g., unable to express feelings;  $\alpha = .95$ ), and cocaine use to avoid social pressure (e.g., feeling pressured to use, being with other people who are using;  $\alpha = .87$ ).

*Concomitant use of other drugs.* Using a forced choice item, participants were asked to indicate which drugs they had used with cocaine in the previous 4 months. Other drugs included alcohol, amyl nitrate (poppers), benzodiazepines/barbiturates, crack, ecstasy, GHB, heroin, ketamine, marijuana, methamphetamine, Rohypnol ("roofies"), and sildenafil (Viagra).

*Contexts of cocaine use.* Participants were asked to indicate on 5-point Likert scales (1 = "never" to 5 = "always") the frequency with which they had used cocaine in the previous 4 months in each of the following contexts: bars, circuit parties, dance clubs, friend's or lover's places, home alone or just hanging out, sex clubs or bathhouses, and sex

parties. A dichotomized version of each of these items was later analyzed for descriptive purposes.

### Analytical plan

Reported cocaine use data from all four time points were analyzed using hierarchical linear modeling (HLM; Raudenbush and Bryk, 1987, 2002). Specifically, we plotted the trajectories of use over four time points for the sample collected during the course of a year (unconditional modeling) and then sought to determine the factors that explain these trajectories (conditional modeling). Essentially, conditional hierarchical linear models allow one to determine the factors that explain the patterns of use over the course of the year. We analyzed data from the 355 men (of 450) who reported cocaine use at baseline, using Poisson distribution to conduct a growth curve analysis of these users over the course of 12 months (Willett et al., 1998). A Poisson distribution is appropriate for data that are "counts" and thus not necessarily normally distributed. The hierarchical structure of this model enabled us to analyze predictors and patterns of cocaine use across time using multiple levels. Level 1 examined intra-individual growth, and Level 2 examined inter-individual growth differences over time. In comparison with more common models, such as repeated measures analysis of variance, this model allows more precise estimates of individual growth over time through empirical Bayes estimation (Strenio et al., 1983). This model also provides greater power to detect predictors of individual differences in change (Raudenbush and Bryk, 1987) and accounts for missing individual data points by using available data points to fit growth trajectories for each participant. Thus we are able to use all points of data collection without losing data because of missed follow-up assessments.

## Results

### Participant characteristics and cocaine use

The average (SD) age of cocaine users at baseline was 32.72 (7.94) years, and the majority of our sample was white and college educated. For further description of the sample see Table 1. The average number of uses within the 4-month period before baseline assessment was 17.73 (22.57) (median = 8). A summary of cocaine use across the four time points is provided in Table 2. At the 12-month assessment, we retained 71.3% of the sample, and 61.7% of the full sample completed all four assessments during the study period. Although those who were older, white, or black were more likely to complete all four assessments, no differences arose with regard to educational attainment, confirmed HIV status, or sexual orientation. Men who were not retained through the 12-month assessment also did not differ with regard to reported frequency of cocaine use at baseline.

TABLE 1. Characteristics of cocaine users at baseline assessment (n = 355)

Characteristic	%	n
Race/ethnicity		
White	49.3%	175
Latino	20.6%	73
Black	16.6%	59
Mixed race	9.6%	34
Asian/Pacific Islander	3.9%	14
Educational attainment		
High school or less	14.9%	53
Associate's degree/some college	37.2%	132
Bachelor's degree	34.4%	122
Graduate degree	13.5%	48
Confirmed HIV status		
HIV-negative	59.2%	210
HIV-positive	40.8%	145
Sexual orientation		
Gay	87.9%	312
Bisexual	12.1%	43

*Cocaine use in combination with other drugs*

At baseline, cocaine users reported combining cocaine with a variety of other drugs such as alcohol (54%, n = 243), marijuana (34.2%, n = 154), ecstasy (28.4%, n = 128), barbiturates/benzodiazepines (21.6%, n = 97), poppers (21.6%, n = 97), methamphetamine (21.3%, n = 96), ketamine (17.6%, n = 79), sildenafil (14.9%, n = 67), GHB (11.8%, n = 53), crack (11.3%, n = 51), Rohypnol (4.9%, n = 22), and heroin (3.8%, n = 17).

*Contexts of use*

At baseline, participants reported using cocaine in a variety of venues, such as bars (78.9%, n = 280), dance clubs (72.1%, n = 256), friend's or lover's places (68.2%, n = 242), home alone or just hanging out (52.7%, n = 187), sex clubs or bathhouses (39.4%, n = 140), circuit parties (36.9%, n = 131), and sex parties (36.3%, n = 129).

*Unconditional growth model*

An unconditional model was examined to describe how the use of cocaine changed over time among the 355 participants who indicated use at baseline. As recommended by Raudenbush and Bryk (2002), we sought to determine which form of change (i.e., linear, quadratic) provided the best fit. The quadratic model yielded the best fit with the following indices for the terms: intercept (b = 2.18, p < .001), linear term (b = -0.89, p < .001), and quadratic term (b = 0.18, p = .01). These results suggest a change over time with a decrease followed by a slight increase in use. The variance components for the intercept, linear, and quadratic terms were significant (p < .001), suggesting that there is much variation in both initial use and change over time that could be explained with the correct predictors in a conditional model.

TABLE 2. Cocaine use at baseline, 4 months, 8 months, and 12 months

Statistic	Baseline (n = 355)	4 Months (n = 282)	8 Months (n = 264)	12 Months (n = 253)
Mean days use (SD)	17.73 (22.57)	9.15 (18.57)	10.86 (20.73)	9.81 (18.03)
Median days use	8	3	2	3

*Conditional model*

A model was constructed to explore whether the patterns of cocaine use over the course of the year could be explained by sociodemographic variables (age and race/ethnicity), confirmed HIV status, psychological factors (anxiety, hostility, depression, sensation seeking for sex, sensation seeking for drug use, general sensation seeking), and reasons for use (use to avoid unpleasant emotions, for physical reasons, for pleasurable times with others, to avoid conflict with others, or to avoid social pressure). All subscales were grand mean centered. We were unable to include educational attainment in the model because of issues of collinearity with race/ethnicity. The following equations were entered for the conditional model:

Level 1 Model

$$\text{Cocaine use}_{jt} = \beta_{0j} + \beta_{1j} \times (\text{TIME})_{jt} + \beta_{2j} \times (\text{TIME}^2)_{jt} + r_{jt}$$

Level 2 Model

$$\beta_{0j} = \gamma_{00} + \gamma_{01} (\text{age}) + \gamma_{02} (\text{HIV}) + \gamma_{03} (\text{black}) + \gamma_{04} (\text{Latino}) + \gamma_{05} (\text{Asian/Pacific Islander}) + \gamma_{06} (\text{other}) + \gamma_{07} (\text{anxiety}) + \gamma_{08} (\text{depression}) + \gamma_{09} (\text{hostility}) + \gamma_{10} (\text{sensation seeking for sex}) + \gamma_{11} (\text{sensation seeking general}) + \gamma_{12} (\text{sensation seeking for drugs}) + \gamma_{13} (\text{unpleasant emotions}) + \gamma_{14} (\text{physical discomfort}) + \gamma_{15} (\text{conflict with others}) + \gamma_{16} (\text{social pressures}) + \gamma_{17} (\text{pleasant times with others}) + u_{0j}$$

$$\beta_{1j} = \gamma_{10} + \gamma_{11} (\text{age}) + \gamma_{12} (\text{HIV}) + \gamma_{13} (\text{black}) + \gamma_{14} (\text{Latino}) + \gamma_{15} (\text{Asian/Pacific Islander}) + \gamma_{16} (\text{other}) + \gamma_{17} (\text{anxiety}) + \gamma_{18} (\text{depression}) + \gamma_{19} (\text{hostility}) + \gamma_{20} (\text{sensation seeking for sex}) + \gamma_{21} (\text{sensation seeking general}) + \gamma_{22} (\text{sensation seeking for drugs}) + \gamma_{23} (\text{unpleasant emotions}) + \gamma_{24} (\text{physical discomfort}) + \gamma_{25} (\text{conflict with others}) + \gamma_{26} (\text{social pressures}) + \gamma_{27} (\text{pleasant times with others}) + u_{1j}$$

$$\beta_{2j} = \gamma_{20} + \gamma_{21} (\text{age}) + \gamma_{22} (\text{HIV}) + \gamma_{23} (\text{black}) + \gamma_{24} (\text{Latino}) + \gamma_{25} (\text{Asian/Pacific Islander}) + \gamma_{26} (\text{other}) + \gamma_{27} (\text{anxiety}) + \gamma_{28} (\text{depression}) + \gamma_{29} (\text{hostility}) + \gamma_{30} (\text{sensation seeking for sex}) + \gamma_{31} (\text{sensation seeking general}) + \gamma_{32} (\text{sensation seeking for drugs}) + \gamma_{33} (\text{unpleasant emotions}) + \gamma_{34} (\text{physical discomfort}) + \gamma_{35} (\text{conflict with others}) + \gamma_{36} (\text{social pressures}) + \gamma_{37} (\text{pleasant times with others}) + u_{2j}$$

The results of this model can be seen in Table 3. The variance in the intercept was explained by sensation seeking for sex (γ = -0.32, p < .05), cocaine use to avoid physical discomfort (γ = 0.33, p < .05), cocaine use to avoid unpleasant



TABLE 3. Predictors of growth parameters of cocaine use among gay and bisexual men

Fixed effects	Intercept		Linear term		Quadratic term	
	Coefficient (SE)	<i>p</i>	Coefficient (SE)	<i>p</i>	Coefficient (SE)	<i>p</i>
Intercept	2.10 <sup>‡</sup> (0.15)	.000	-1.4 <sup>†</sup> (0.44)	.002	0.42* (0.17)	.02
Demographic factors						
Age	0.002 (0.01)	.83	0.02 (0.03)	.53	-0.01 (0.01)	.32
Black	-0.09 (0.18)	.62	0.04 (0.50)	.94	0.03 (0.20)	.90
Latino	0.27 (0.16)	.10	0.23 (0.46)	.62	-0.07 (0.18)	.71
Asian/Pacific Islander	-0.37 (0.33)	.26	2.26* (0.89)	.01	-0.68 (0.35)	.05
Other	0.33 (0.35)	.35	-0.56 (0.95)	.55	0.28 (0.37)	.45
Psychosocial factors						
Depression	-0.14 (0.13)	.27	-0.25 (0.36)	.49	0.18 (0.14)	.22
Hostility	0.02 (0.14)	.91	0.06 (0.37)	.88	0.06 (0.15)	.70
Anxiety	0.02 (0.14)	.92	0.17 (0.39)	.67	-0.17 (0.16)	.29
Sensation seeking for drug	0.13 (0.12)	.31	-0.26 (0.35)	.45	0.14 (0.14)	.30
Sensation seeking for sex	-0.32* (0.14)	.03	0.67 (0.41)	.10	-0.25 (0.16)	.13
Sensation seeking (general)	-0.03 (0.13)	.81	0.09 (0.38)	.81	-0.08 (0.15)	.60
Unpleasant emotions	0.46 <sup>‡</sup> (0.11)	<.001	0.15 (0.31)	.63	-0.13 (0.12)	.27
Physical discomfort	0.33* (0.14)	.02	-1.03* (0.39)	.01	0.34* (0.16)	.03
Pleasant times with others	0.41 <sup>‡</sup> (0.08)	<.001	-0.78 <sup>†</sup> (0.23)	.001	0.31 <sup>†</sup> (0.09)	.001
Conflict with others	-0.15 (0.14)	.30	-0.65 (0.41)	.12	0.30 (0.17)	.07
Social pressures	-0.08 (0.08)	.36	0.24 (0.24)	.31	-0.10 (0.09)	.30
HIV status	0.03 (0.14)	.82	0.28 (0.40)	.49	-0.12 (0.16)	.46
Random effects	1.15 <sup>‡</sup>		7.70 <sup>‡</sup>		1.22 <sup>‡</sup>	

\**p* < .05; <sup>†</sup>*p* < .01; <sup>‡</sup>*p* < .001.

emotions ( $\gamma = 0.46, p < .001$ ), and cocaine use for pleasant times with others ( $\gamma = 0.41, p < .001$ ). The linear slope was explained by identifying as Asian/Pacific Islander ( $\gamma = 2.26, p = .01$ ), cocaine use to avoid physical discomfort ( $\gamma = -1.03, p = .01$ ), and cocaine use for pleasant times with others ( $\gamma = -0.78, p = .001$ ). The quadratic term was explained similarly, by cocaine use to avoid physical discomfort ( $\gamma = 0.34, p < .05$ ) and cocaine use for pleasant times with others ( $\gamma = 0.31, p = .001$ ). Identifying as Asian/Pacific Islander ( $\gamma = -0.68, p = .05$ ) and use to avoid conflict with others approached significance ( $\gamma = 0.30, p = .07$ ). These results suggest that, at baseline, more frequent use of cocaine is explained by reliance on the drug to avoid unpleasant emotions, to enhance pleasant times with others, and to avoid physical discomfort. More frequent use is negatively related to sexual sensation seeking. Patterns indicate that use over time is related to reliance on the drug to avoid physical discomfort and to enjoy pleasant times with others. Asian/Pacific Islander men demonstrate less decrease in their use over time.

### Discussion

This study investigated trajectories of powder cocaine use over time among gay and bisexual club-drug using men. Many studies have investigated cocaine use and its associations cross-sectionally, but this longitudinal investigation, which used multilevel modeling, has added to the current literature with respect to trajectories of individual cocaine use over time and associated factors.

At baseline, the frequency of cocaine use was not explained by depression, anxiety, or hostility; however, the frequency of use was explained by the global assessment, which measured immediate triggers of "unpleasant emotions," a term that incorporates using cocaine when lonely, bored, anxious, guilty, or confused. Thus, in quantitative surveys, a global assessment of negative emotions may be more efficacious than using scales that assess diagnostic criteria for mood or anxiety disorders because these scales are not always sensitive to general forms of negative affect, such as boredom and confusion. A higher frequency of use at baseline was also related to use to facilitate pleasant times with others. Gay and bisexual men appear to use as a means of social lubrication. Furthermore, more than half of the sample used cocaine concomitantly with alcohol, and the majority of the sample reported using cocaine at bars; therefore, these findings further suggest that cocaine use is strongly tied to social contexts.

Using cocaine for the same reasons also explains patterns of use over time. Cocaine use is often triggered by social situations and through the avoidance of physical discomfort (e.g., being tired); however, these men appear to rely less heavily on use for the same reasons as time passes because, although use is not stable across time, use generally decreases. It should also be noted that, with regard to our quadratic term, cocaine use to avoid conflict with others approached significance, which suggests that men may also decelerate use more quickly when using for this reason. At each 4-month follow-up assessment (including baseline), the

majority of the sample reported the use of cocaine on fewer than 9 days, which suggests that use among this sample tended to be recreational rather than chronic. Therefore, this sample differed greatly from samples in traditional trials that focus solely on users diagnosed as dependent (Gallop et al., 2007). It is important to focus on recreational use, because findings derived solely from abusers or those who are dependent are not fully generalizable to more casual users of this prevalent substance.

Although cocaine use is directly tied to certain triggers, the frequency of use at baseline assessment was found to be negatively correlated with sexual sensation seeking. Previous findings have suggested negative associations between cocaine use and sex (Brown et al., 2005); however, studies of men who have sex with men report that cocaine use before or during sex leads to an increased likelihood of unprotected anal sex (Hirshfield et al., 2004). A large percentage of men who have sex with men also report that cocaine use increases sex drive and sexual performance (Rawson et al., 2002). Although cocaine use is not as strongly tied to sex as methamphetamine (Halkitis et al., 2008; Hirshfield et al., 2004; Rawson et al., 2002), our findings suggest that frequent cocaine users may be using the drug less for sexual reasons and more for social and emotional reasons. Future research should investigate whether cocaine is used specifically for sex or if it is merely associated with socialization before sex.

Over time, the majority of the sample decreased the frequency of cocaine use. Although our sample consisted of gay and bisexual men, our findings corroborate traditional investigations, which consisted mainly of heterosexual participants who also decreased or ceased use over time, in part because of marriage and/or having children (White and Bates, 1995). Furthermore, the majority of our sample consisted of white men; therefore, it was these men who generally decreased use over time. Corroborating the findings of Braun et al. (1996), use by Asian/Pacific Islander men displayed less of a decrease over time; however, this group reported using cocaine less often than other races in the sample. This investigation focused solely on trajectories of powder cocaine use; thus our findings with regard to race have not been tainted with reports of crack cocaine use as in many other investigations. Future studies should examine transitions between powder and crack cocaine use to gain a better understanding of drug sequence trajectories.

Unexpectedly, age was not related to cocaine use in our current investigation. Although previous longitudinal studies have generally found that, as people age, cocaine use decreases, our sample of gay and bisexual club-drug users may live different lifestyles than do their heterosexual counterparts. Gay men are unable to get formally married in the same extent as heterosexual couples and are less likely to have children. Single life and urban environment may differentiate many gay and bisexual urban men from other men

who traditionally “settle down” by their 30s. However, one must keep in mind that this sample was purposive in that respondents had to self-identify as gay or bisexual “club-drug” users to qualify. Therefore, these men do not fully represent the gay population in New York City.

### *Limitations*

Like many studies, this investigation has limitations. As mentioned, the current sample was not derived from random sampling methodologies. Such methods would not allow us to acquire a large number of gay and bisexual club-drug users. Also, to meet inclusion criteria, one had to report at least six instances of club-drug use within the prior year; therefore the external validity of the findings is limited to more frequent club-drug users. These findings also may not be fully generalizable to the heterosexual population or to those residing outside of urban environments. Powder cocaine is also far more prevalent than the other drugs studied in this investigation. Although cocaine is sometimes considered a “club drug,” one must keep in mind that the cocaine users in this sample were recruited among a large sample of club-drug using men. Another limitation is that men in our sample may have been at different points in their drug careers. Thus our investigation was merely a 12-month snapshot of their reported behaviors. Some men might have begun using cocaine during the trial, but it was not feasible to include these men in the analysis. Finally, attrition may have affected the results of this analysis. Although the majority of men completed all assessments in the 12-month period, men who were younger, Latino/Hispanic, or of “other” race were more likely to miss assessments throughout the study.

### *Implications and conclusions*

Many studies report trajectories of cocaine use in treatment settings, which focus solely on problematic or chronic use. This investigation examined the cocaine use of a large sample of club-drug users, and results are more generalizable to a wider group of cocaine users who are not necessarily abusers or dependent. The frequency of use by the men in our sample was primarily explained by triggers such as unpleasant emotions, physical discomfort, and the desire for pleasant times with others. The majority of users in the sample appear to use powder cocaine in a recreational manner and in a large variety of contexts, but one must keep in mind that the majority of these men are polydrug users, and therefore cocaine may be only a feature of these men’s drug repertoires. Trajectories of polydrug use are complex (Halkitis et al., 2007), and cocaine use tends to be initiated before the use of other club drugs (Halkitis and Palamar, 2008); thus these complexities are further dependent on where these men reside in their drug careers. Future longitudinal studies to investigate emergence into adulthood are necessary to

capture predictors of cocaine use before it begins. This study discovered immediate antecedents or triggers to cocaine use, but future studies should investigate antecedents to initiation of use. This will allow us to observe users' drug careers in a fuller perspective and will additionally allow us to gain a better understanding of use over time. Because the use of many illicit drugs has become relatively "normalized" (Parker et al., 1998) and more socially accepted within certain social circles, it is important to continue to examine a broader range of cocaine users to discover why people begin using and why they continue to use.

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