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## The Problem of “Just for Fun”: Patterns of Use Situations among Active Club Drug Users

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### Abstract

Existing research has demonstrated the significance of situational antecedents to substance use. The current study used a cluster analytic approach to identify groups of club drug users who report using substances in similar situations (assessed by the Inventory of Drug Taking Situations) with longitudinal data from 400 active drug users. A three-cluster solution emerged in baseline data and was replicated in 12-month follow-up data. Groups were identified as Situationally Restricted, Pleasure Driven, and Situationally Broad users. Group differences were observed on measures of mental health, attitudes towards substance use, amount of substance use, and rates of substance dependence. Cluster membership predicted substance dependence after controlling for past dependence, current use, and current depression/anxiety.

### Keywords

Club drug use; Substance dependence; Substance abuse treatment; Substance use situation

### 1. Introduction

Club drugs (methamphetamine, cocaine, ketamine, ecstasy, GHB and LSD) remain key substances of use and abuse among youth and young adults in the United States (Substance

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Tyrel J. Starks shared responsibility for developing the analysis plan, had primary responsibility for executing analyses as well as writing. Sarit A. Golub shared responsibility for developing the analysis plan, synthesizing analytic findings, and writing. Brian C. Kelly was project director of the study and assisted with analyses and writing. Jeffrey T. Parsons originated the study and supervised all aspects of its implementation. All authors helped to conceptualize ideas, interpret findings, and provided input on all drafts of the article.

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Abuse and Mental Health Services Administration, 2008). Club drug use presents an ongoing public health concern as they have been associated with a range of physical, motor, neurocognitive, and psychological complications (Freese, Miotto, & Reback, 2002). In addition, the use of club drugs have been linked to risk for sexually transmitted infections (e.g., Halkitis, Shrem, & Martin, 2005; Maxwell & Rutkowski, 2008; Purcell, Reimen, Woods, & Parsons, 2005). For these reasons, it is important to further identify contextual factors that shape club drug use.

### 1.1 Relevance and assessment of substance use situations

Turner, Annis and Sklar (1997) proposed that understanding the situations in which people use substances can inform treatment planning by providing information related to the motivation for and the function of substance use behavior. Annis (1982) initially developed the *Inventory of Drinking Situations (IDS)* to assess the frequency of alcohol use associated with particular situations. Subsequently, they developed the *Inventory of Drug Taking Situations (IDTS)*, which modified the IDS to examine the extent to which various situations stimulate substance use (Annis, Turner, & Sklar, 1996).

Substance use situations, as assessed by the IDTS encompass aspects of emotion, cognition, physical sensation, and social setting/interaction (Annis et al. 1996). Participants are presented with statements that identify a feeling, thought, sensation, or setting/interaction and indicate whether they have used substances “Never,” Rarely,” “Sometimes,” “Often,” or “Always” in response to that situation. The IDTS traditionally provides information related to eight subscales, five of which are relevant to active club drug users, including: Unpleasant Emotions (e.g., “I was depressed about things in general.” “I was bored.”); Physical Discomfort (e.g., “I felt shaky, sick or nauseous.” “I had a headache or was in physical pain.”); and Conflict with Others (e.g., “When I felt tense or uneasy in the presence of someone.” “When other people rejected me or didn't like me.”); Social Pressure (e.g., “When I was out with friends and they kept suggesting we go somewhere to do drugs.” “When I felt pressured to use drugs and felt I couldn't refuse.”); and Pleasant Times with Others (e.g., “When I was with friends and wanted to have a good time.” “When I wanted to celebrate.”).

Available evidence suggests that drug use situations are meaningfully related to amount, pattern, and course of club drug use; however, results vary with regard to the significance of various IDTS subscales. Use in response to Unpleasant Emotions has been linked to higher levels of methamphetamine use (Halkitis, Parsons and Wilton, 2003), higher levels of cocaine use (Waldrop, Back, Verduin, & Brady, 2007), increasing cocaine use over time (Palamar, Mukherjee, and Halkitis, 2008), greater likelihood of poly-drug use (Kelly & Parsons, 2008), and greater likelihood of heroin relapse (El Sheik & Bashir, 2004). Use in response to Physical Discomfort and Conflict with Others has been associated with higher levels of methamphetamine use (Halkitis et al., 2003). Additionally, use in response to Conflict with Others has been associated with greater sensitivity to daily hassles among individuals who were cocaine dependent (Waldrop, Back, Brady, Upadhyaya, McRae, & Saladin, 2007). Use in response to Social Pressure was found to be associated with greater sensitivity to daily hassles among individuals who were cocaine dependent (Waldrop, Back, Brady et al., 2007) and greater likelihood of heroin relapse (El Sheik & Bashir, 2004). Finally, use in response to Pleasant Times with Others was associated with greater likelihood of polydrug use (Kelly & Parsons, 2008) and increasing cocaine use over time (Palamar et al., 2008).

### 1.2 Using IDTS data to tailor interventions

In order to realize Turner et al.'s (1997) goal of using the IDTS to tailor intervention strategies, researchers might develop modules associated with each individual use situation. An alternative, and potentially more useful method of tailoring interventions, is to determine

whether there are groups of drug users who are similar with regard to the situations in which they use. For example, one could imagine a group of users who use most frequently in response to Unpleasant Emotions and Physical Discomfort and a second group who use most frequently in response to Social Pressure and Pleasant Times with Others. If such patterns of use were found to exist, interventions could then be tailored towards these cohorts of similar users.

Previous research has suggested that substance dependence is associated with a number of factors, among them: gender, anxiety, and depression (Compton, Conway, Stinson, & Grant, 2006; Compton, Cottler, Jacobs, Ben-Abdallah & Spitznagel, 2003; Hicks et al., 2007; Waller, Hallfors, Halpern, Iritani, Ford, & Guo, 2006). If it could be demonstrated that belonging to a cohort with a particular pattern of use situations predicts dependence above and beyond factors already identified in the literature, it would provide evidence for addressing factors associated with use situations into current approaches to intervention.

The current study had two primary aims. The first aim was to determine whether or not cohorts of active club drug users who use in response to similar situations could be identified. Assuming cohorts could be identified, the second aim of the study was to determine if cohorts differed on measures of anxiety and depression, attitudes towards substance use, amount of substance use, and substance dependence. In addition, this second aim included examining whether current cohort membership would predict current substance dependence above and beyond factors already known to be associated with dependence.

## 2. Methods

### 2.1 Study Design

The data for this study were derived from a longitudinal study of club drug use among young adults in New York City. We recruited participants via time-space sampling (MacKellar, Valleroy, Karon, Lemp & Janssen, 2006; Muhib, Lin, Stueve, Miller, Ford, & Johnson, 2001; Stueve, O'Donnell, Duran, San Doval, & Blome, 2001). From December 2004 to December 2006, we selected venues at random from a list of 223 NYC dance clubs and bars/lounges as well as special events throughout the city. Each weekend, recruitment teams were sent to randomly assigned venues. Field staff approached club patrons as they crossed a predefined threshold (e.g., the entrance) during three-hour shifts selected with random start times (from 9 p.m. to 3 a.m.). Recruiters used Palm® Pilots in the field to record responses to a brief two minute survey for which participants received no compensation. Those who declined to take this brief survey did not significantly differ in terms of race/ethnicity or gender from those who assented to participate (Kelly, Parsons, & Wells, 2006; Parsons, Grov, & Kelly, 2008).

Eligibility criteria for participation were embedded in this brief survey. To be eligible, the individual had to be aged 18-29 years and report using methamphetamine, cocaine, ecstasy, ketamine, GHB or LSD at least three times in the previous year and at least once in the prior three months. If a patron was found eligible, staff explained the project, distributed recruitment materials with project contact information, and collected contact information from the individual. Eligible participants were contacted by telephone within a week of being screened. If the participant was still interested in the study, eligibility was confirmed and participants were scheduled for an appointment to complete an in-depth interview and a structured survey. Participants were contacted again at 4, 8, and 12 month follow-up to complete similar batteries of questionnaires. Participants were also given the option to complete the follow-up surveys online. Participants received \$50 in compensation for completion of the baseline assessment, \$30 for each of the 4-mo and 8-mo assessments, and \$50 for the 12-mo assessment.

All procedures were approved by the Institutional Review Board of Hunter College in NYC. Recruitment methods, including detailed information on race/ethnicity during the screening process, have been described in further detail elsewhere (Parsons, Grov, & Kelly, 2008).

## 2.2 Analytic Sample

This paper uses data gathered at baseline and the 12-month follow-up visits. At baseline, we enrolled 100 gay and bisexual men, 100 lesbian and bisexual women, 100 heterosexual men, and 100 heterosexual women into the project, for a total of 400 participants. Participants in the sample were racially and ethnically diverse and, overall, well-educated (Table 1). Participants ranged in age from 18 to 29 years ( $M = 23.9$ ,  $SD = 2.75$ ). There were no gender or sexual orientation differences in racial/ethnic composition, employment status, or educational attainment. Gay and bisexual men (mean  $M = 24.6$ ) were slightly older than heterosexual women ( $M = 23.5$ ), ( $F(3, 396) = 3.09$ ,  $p < 0.05$ ) and were the most likely to report making more than \$30,000 in the last year — 49.5% compared with 38.0% of lesbian and bisexual women, 27.0% of heterosexual men, and 30.0% of heterosexual women;  $X^2(6) = 14.1$ ,  $p < .05$ . Finally, gay and bisexual men were the most likely to report being single (78.0%) compared with lesbian and bisexual women (54.0%), heterosexual men (54.0%), and heterosexual women (59.0%),  $X^2(3) = 16.4$ ,  $p < .001$ .

At the 12-month follow-up, 326 (81.5%) of the original 400 participants were retained and 318 (97.5%) of those completed the IDTS. Examination of those 318 cases suggested that retention and completion of the IDTS was not associated with gender, age, white-race, Hispanic ethnicity, full-time employment status, completion of a four-year college degree, sexual orientation or baseline scores on IDTS subscales, quantity of substance use, substance dependence, anxiety or depression.

## 2.3 Measures

During assessments, which were conducted in private rooms at the community-based research offices of the investigators, participants responded to questions on computers equipped with audio computer-assisted self-interview (ACASI) software.

**2.3.1 Demographic information**—Participants reported their gender, race/ethnicity, age, education level, employment status, and sexual orientation.

**2.3.2 Club drug use and dependence**—Participants completed a battery of questions related to drug use (Parsons, Grov, & Kelly, 2009). Questions assessed their lifetime use, recent use (in the past four months), and frequency of recent use (number of days they used methamphetamine, cocaine, ecstasy, ketamine, GHB, and LSD in the past four months). Composite scores representing the number of “drug use instances” were generated by totaling the number of days a participant reported using each of the six club drugs.

Club Drug Dependence was assessed using a modified version of the eight-item *Composite International Diagnostic Interview* (CIDI) dependence scale (World Health Organization, 2006). Traditionally, this measure is used for a specific drug (e.g., “In the past 12 months, did your use of *cocaine* ever interfere with your work at school, a job, or at home?”). Pilot work conducted by Parsons et al (2006) suggested that most participants would report using multiple club drugs, and to prevent participant fatigue, we modified the questions to read “club drugs” (e.g., “... did your use of *club drugs* ever interfere with your work ... ?”). ACASI prompted participants with a reminder that club drugs were defined as any of the six drugs of interest to the study. Participants were considered to exhibit signs of dependence if they responded “yes” to three or more items (World Health Organization, 2006).

**2.3.3 Inventory of Drug Taking Situations (IDTS)**—Five-subcales (described in detail above), comprised of 35-items, of the *Inventory of Drug Taking Situations* (IDTS) (Annis, Turner, & Sklar, 1996) were used to assess the situations in which individuals use substances. Participants were asked to rate on a 5-point Likert-type scale from “Never” to “Always” how often they had used club drugs in response to Unpleasant Emotions ( $\alpha = .92$ ), Physical Discomfort ( $\alpha = .61$ ), Conflict with Others ( $\alpha = .87$ ), Social Pressures ( $\alpha = .80$ ), and Pleasant Times with Others ( $\alpha = .73$ ).

**2.3.4 Depression and Anxiety**—Finally, the depression and anxiety subscales of the *Brief Symptom Inventory* (BSI) (Derogatis & Melisaratos, 1983) were used to assess levels of these conditions. Participants were asked to rate on a 5-point Likert-type scale from “Not at all” to “extremely” the extent to which they had experienced feelings, sensations, and experiences associated with anxiety (e.g., “Feeling fearful”) and depression (e.g., “Feeling lonely”). A summary score, representing a participant's response across all anxiety and depression items was used for the following analyses. While the authors acknowledge that some useful distinctions exist between the constructs of anxiety and depression, the use of a combined score Anxiety/Depression score in the following analyses was supported in various ways. First, the BSI is structured to provide a global score, which is calculated by totaling all of its subscale scores, while not all subscales were administered in the current study, calculation of an overall score has precedent in the BSI scoring paradigm (Derogatis, 1975). In addition, an exploratory factor analysis with maximum likelihood extraction and varimax rotation was conducted on BSI items in the current sample. The scree plot strongly supported the extraction of a single factor. All 13 BSI anxiety and depression items contributed to this single factor with loadings greater than .58. When a two factor solution was extracted, nine of the 13 BSI items cross loaded significantly. Finally, a high degree of comorbidity between anxiety and depression has been noted in the clinical literature (Hirshfeld, 2001). Due to symptom overlap, individuals with either anxiety or depression may show elevations on both scales, making the use of the combined scale a better indicator of overall affective disturbance. The reliability of the combined anxiety and depression scale was very high ( $\alpha = .94$ ).

**2.3.5 Decisional Balance**—The *Decisional Balance Questionnaire* (DBQ) (Prochaska et al., 1994) was used to assess participants' positive and negative expectancies for drug use. Participants are asked to indicate the importance of a series of statements with regard to the decisions they make about substance use. Participants responded on a five-point Likert scale ranging from “Not at all” to “Extremely;” item responses were summed to produce scale scores. Both subscales demonstrated good reliability ( $\alpha = .84-.85$ ) The Pros subscale, which assesses positive expectancies, includes such items as, “Drugs help me deal with my problems” and “Drugs help me have fun and socialize.” The Cons subscale, which assesses negative expectancies, includes such items as, “My drug use causes problems with others” and “Having to lie about my drug use bothers me.”

## 3.0 Results

### 3.1 Analytic Procedure

Two basic clustering procedures are available, hierarchical and iterative (K-means) (Aldenderfer and Blashfield, 1984; Norušis, 2010). The former method creates clusters by combining cases that are determined to be closest to one another in space. The number of clusters is determined by looking for points at which highly disparate groups are combined. The latter method begins with a preset number of clusters and moves the cluster centers iteratively until they are positioned to minimize the distance from each points to the nearest cluster center.



The use of a two-stage exploratory clustering procedure has become common (Beitchman et al., 2001; Vida et al., 2009). Hierarchical clustering is used to determine the number of clusters present in the dataset. Cluster centers generated from the hierarchical analysis are used as the initial starting points for the K-means analysis, which refines the cases that are assigned to each cluster. This approach is preferable to the use of either hierarchical or K-means clustering alone for exploratory purposes. Hierarchical clustering does not allow for cases assigned early in the procedure to be reassigned as cluster centers shift (Norušis, 2010). K-means analysis may lead to improper solutions depending upon the location of initial starting points (Norušis, 2010). Using hierarchical analysis to identify initial cluster centers and K-means to then refine cluster membership capitalizes upon the strengths of both methods.

Baseline data from IDTS subscales were examined first. Similar to Vida et al. (2009) and Beitchman et al. (2001) hierarchical (Ward's method) clustering was used to identify the appropriate number of clusters. Examination of large jumps in agglomeration schedule, as evidenced by distance coefficients, suggested a three or four cluster solution. K-means cluster analyses were used to refine hierarchical clusters using cluster centers from hierarchical clusters as initial cluster centers.

Aldenderfer and Blashfield (1984) pointed out the utility of validating cluster solutions by examining between-cluster differences on external variables and examining the reproducibility of clusters. The three and four cluster solutions were evaluated by examining between-cluster differences on pros and cons of drug use, BSI anxiety/depression scores, drug use instances, and rates of dependence. In addition, final cluster centers from baseline k-means analyses were used to generate k-means cluster solutions in 12-month follow-up data. At baseline and 12-month follow-up, the three cluster solution maximized between group differences on external variables and pattern of IDTS elevations within clusters were stable across time periods. The four cluster solution was evaluated as less adequate by both criteria. Table 2 contains means and standard deviations of clustered variables, external variables, and outcomes for the three cluster solution in 12-month follow-up data. We chose to focus on clusters in 12-month follow-up data in order to facilitate an analyses of the relationship between current use pattern and current dependence above and beyond other factors, some of which (e.g., historical dependence) were assessed at baseline.

### 3.2 Situational Club Drug Use Patterns Observed in a Sample of Active Club Drug Users

Figure 1 depicts mean IDTS subscale scores at 12-month follow-up for each cluster generated in 12-month follow-up data. Results for baseline IDTS data for clusters generated in baseline data were highly similar. A series of 3 (cluster)  $\times$  1 (Drug Taking Situation) univariate ANOVAs were conducted to evaluate the cluster solution. At 12-month follow-up, all between cluster differences were significant on all IDTS subscales (see Table 2). As discussed above, the pattern of IDTS scale scores across clusters was similar in baseline data. Interestingly, despite this similarity at the cluster-level, the individuals within clusters changed across time periods. Of the 311 individuals for whom cluster scores were generated at baseline and 12-month follow-up, 143 (46.0%) were placed in different clusters at the two time periods.

Examination of the IDTS subscale profiles for each cluster suggested meaningful differences in patterns of use that characterized each cluster. Individuals in Cluster 1 constituted a Situationally Restricted group. These individuals endorsed limited use across all the use situations assessed by the IDTS. Individuals in Cluster 2 constituted a group whose use was primarily Pleasure Driven, suggested by the salience of their responses on the Pleasant Situations subscale compared to other use situations assessed by the IDTS. Finally, individuals in Cluster 3 constituted a Situationally Broad group. These individuals endorsed a higher frequency of use in all the situations assessed by the IDTS. Notably, while IDTS scores for each subscale increase across Situationally Restricted, Pleasure Driven, and Situationally

Broad groups, it is the relative elevations of scores within each cluster that suggest that the cluster solution is potentially meaningful. Most notably, individuals in the Pleasure Driven cluster show a spike elevation of the Pleasant Situations subscale relative to all other IDTS subscales. In contrast, those in the Situationally Broad categories show more evenly elevated scores across all subscales.

Table 2 contains information related to the age and demographic characteristics of individuals within the three clusters. Clusters did not differ with regard to age, gender, sexual orientation, white-race or Hispanic-ethnicity.

### 3.3 Situational Substance Use Patterns and External Variables

Table 2 contains mean scores for the combined Depression and Anxiety subscales of the BSI at 12-month follow-up. A 3 (cluster)  $\times$  1 (BSI Depression/Anxiety Mean) ANOVA was conducted to evaluate between-cluster differences in BSI scores. There was significant variability among clusters, with cluster membership accounting for 17.7% of the variance in BSI Depression/Anxiety scores at 12-month follow-up. Individuals in the Situationally Broad cluster had higher average BDI Depression/Anxiety scores followed by those in the Pleasure Driven and then Situationally Restricted cluster. Results were similar in baseline data.

Table 2 contains mean scores for the Pros and Cons subscales of the DBQ at 12-month follow-up. Two 3(cluster)  $\times$  1(DBQ subscale) ANOVA was conducted to evaluate between-cluster differences in DBQ subscale scores. There was significant variability among clusters, with cluster membership accounting for 15.8% of the variance in the Pro subscale and 9.8% of the variance in the Con subscale at baseline. Individuals in the Situationally Broad cluster had higher average scores on both the Pro and Con subscales followed by those in the Pleasure Driven and then Situationally Restricted clusters. Results were similar in baseline data.

Table 2 contains the mean number of drug use instances and the prevalence of club drug dependence for each cluster in 12-month follow-up data. Due to severe skew, number of club drug use instances was dichotomized. The median number of use instances in 12-month follow-up data was five and four or fewer instances of use corresponded to an average use rate of once per month or less. Therefore, reported instances of use in 12-month follow-up data were divided into High (Five or more drug use instances in the past four months,  $N=178$ , 56.0%) and Low (four or fewer drug use instances in the past four months,  $N=140$ , 44.0%) use groups. The differences in rates of club drug use among clusters were examined using a 3 (cluster)  $\times$  2 (low/high use)  $X^2$  test of independence. Individuals in the Situationally Restricted cluster were more likely to be in low use group followed by individuals in the Pleasure Driven and then the Situationally Broad use cluster at both time periods. The differences in rates of club drug dependence among clusters were examined using a 3 (cluster)  $\times$  2 (dependent/not dependent)  $X^2$  test of independence. Results supported the hypothesis of significant between-group variability in rates of club drug dependence. Individuals in the Situationally Broad cluster were more likely to be dependent followed by individuals in the Pleasure Driven and then the Situationally Restricted cluster at both time periods.

### 3.4. Predictive Significance of Situational Use Patterns

A hierarchical logistic regression was conducted to evaluate the predictive utility of IDTS clusters to predict dependence at 12-month follow-up. Baseline dependence was entered in the first block. BSI anxiety/depression scores (assessed at 12-month follow-up) and Low vs. High number of substance use instances (assessed at 12-month follow-up) were entered in the second block. Finally, IDTS cluster at 12-month follow-up was entered in the third block. Indicator coding was used to create dummy variables with the Situationally Restricted category used as the indicator. Cluster membership at 12-month follow-up significantly predicted dependence

at 12-month follow-up above and beyond factors entered in earlier blocks. Specifically, individuals in the Pleasure Driven category were more likely to be dependent compared with those in the Restricted Use category ( $OR = 2.19, p < .01$ ). The final step, which included IDTS clusters, resulted in a .03 ( $p < .05$ ) increase in Nagelkerke  $R^2$ . The final model demonstrated a good fit to the data by the Hosmer-Lemeshow goodness-of-fit test ( $\chi^2(8) = 4.50; p = .81$ ) and correctly classified 74.6% of participants. The Nagelkerke  $R^2$  value of .40 indicates that the specified model represents an improvement in fit compared to the null model. These findings underscore the suggestion that IDTS clusters represent meaningful patterns of behavior rather than simply variation in scale elevation. Situationally Broad users demonstrated the most uniformly high scale elevations across IDTS subscales and yet, they do not differ from Situationally Restricted users after accounting for historical dependence, current use, and current Depression/Anxiety. In contrast, Pleasure Driven users, characterized by a salient elevation of a single IDTS subscale (Pleasant Situations) relative to other IDTS scales, are more likely to be dependent than Situationally Restricted users, even after accounting for these variables.

## 4.0 Discussion

The current study represents a meaningful step towards Turner et al.'s (1997) original goal of using information related to the situations in which individuals use substances to understand the function of substance use and inform intervention. Groups of active club drug users who use in similar situations were observed. Groups were replicated at 12-month follow-up and group membership was found to predict substance dependence above and beyond previous dependence, current amount of use, and current anxiety/depression. These findings suggest that the IDTS may indeed provide information relevant to treatment planning and intervention.

These findings highlight the unique status of a group of users who use primarily for reasons associated with pleasant situations with others. This group reports significantly more instances of substance use than Situationally Restricted users, suggesting that Pleasure Driven users are using a great deal in their single preferred situation. This combined with the fact that Pleasure Driven users were more likely than Situationally Restricted users to be dependent even after accounting for anxiety/depression, history of dependence, and amount of use suggests that Pleasure Driven use is better seen as problematic rather than as innocuous recreation.

Intervention with this group may be complicated by the fact that their use is likely to be embedded within social contexts that these individuals experience as reinforcing. This possibility is supported not only by the content of IDTS items, but also by the finding that Pleasure Driven users report more benefits from their drug use compared with Situationally Restricted users and fewer undesired consequences compared with Situationally Broad users. It is possible that, for this group, reduction in substance use may come at the cost of increasing distance within interpersonal relationships that are potentially meaningful and/or alienation from social structures that provide a meaningful sense of community. This possibility suggests that a therapeutic approach with these individuals might incorporate sensitivity to ambivalence, account for the potential social/relational significance of substance use, and foster alternative behaviors which fulfill the function of social connection and enjoyment.

The finding that Situationally Broad use was not associated with higher rates of dependence compared with Situationally Restricted use after accounting for previous dependence, current amount of use, and current anxiety/depression levels suggests that this pattern of use may serve as an indicator of particularly high levels of negative affect. Recent research has highlighted the interplay between substance use and symptoms of anxiety and depression, in which substance use may both precipitate and alleviate anxious and depressive symptoms (Valentiner, Mounst, & Deacon, 2004). Consistent with this, the Situationally Broad use cluster reported



the highest level of perceived benefits and the highest level of perceived negative consequences to their substance use. The success of treatment with these individuals may be increased by incorporating a focus on mood and anxiety related difficulties. Identifying alternative mechanisms for reducing symptoms of anxiety and depression and increasing the salience of negative effects on mood may reduce perceived benefits of use and increase perceived costs and thus reduce ambivalence about reducing the amount of their use.

Available evidence suggests that situational antecedents are meaningfully related to amount, pattern, and course of club drug use (El Sheik & Bashir, 2004; Halkitis et al., 2003; Kelly & Parsons, 2008; Palamar et al., 2008; Waldrop, Back, Verduin, & Brady, 2007; Waldrop, Back, Brady, Upadhyaya, McRae, & Saladin, 2007). Our findings go a step beyond this existing body of work to point out the importance of examining relationships among IDTS scores. This is most clearly illustrated by contrasting Pleasure Driven and Situationally Broad users in the current sample. Both groups have high scores on the Pleasant Times with Others scale; however, for the Pleasure Driven group, this scale elevation occurs in the context of relatively low scores on all other IDTS scales while for the Broad Use group, the Pleasant Times with Others elevation occurs in the context of relatively high scores on all other IDTS scales. There are meaningful differences between these two groups with regard to anxiety, rates of dependence, and perceptions of benefits and unpleasant consequences of use. These differences suggest potential differences in treatment approach and barriers to treatment success that would be missed if the Pleasant Times with Others scale were used to predict outcomes separately from other IDTS scales.

Several limitations and directions for future research should be noted. First, while clustering participants may help to identify patterns of use that may inform treatment conceptualization, it should not be assumed that all individuals within groups are identical. The available cluster solution was selected because it minimized within-group variability and produced meaningful differences on external variables relative to other solutions; however, this does not preclude the need to attend to individual differences within groups. Second, the current study examined active drug users. Additional research is needed to understand the relationships among situational antecedents in populations of club drug users not actively using or in treatment. Clusters of situational antecedents based on IDTS responses might be very different within such populations; however, given that reducing the frequency of use of active club drug users represents a meaningful public health goal, focusing on identifying groups to target interventions with this population still represents a valuable contribution to the literature. Third, conclusions are limited by the fact that the sample was gathered in New York City and results may not generalize to other regions of the United States. Finally, while there was stability in the cluster solutions produced at baseline and 12-month follow-up, the individuals within clusters at each time period were not necessarily the same. Future research should focus on identifying factors that are associated with developmental changes in situational patterns of substance use.

Despite these limitations, the current study contributes to our understanding of drug use situations and how knowledge about the situations in which individuals use substances may inform the tailoring of intervention with these groups. Our findings suggest that drug use restricted to pleasant situations with others is best viewed as problematic rather than innocuous entertainment and use across multiple situations may be indicative of high levels of anxiety and depression. This type of information is valuable, not only in determining the content of intervention with these groups, but also in predicting possible barriers to intervention success and sources of client resistance.

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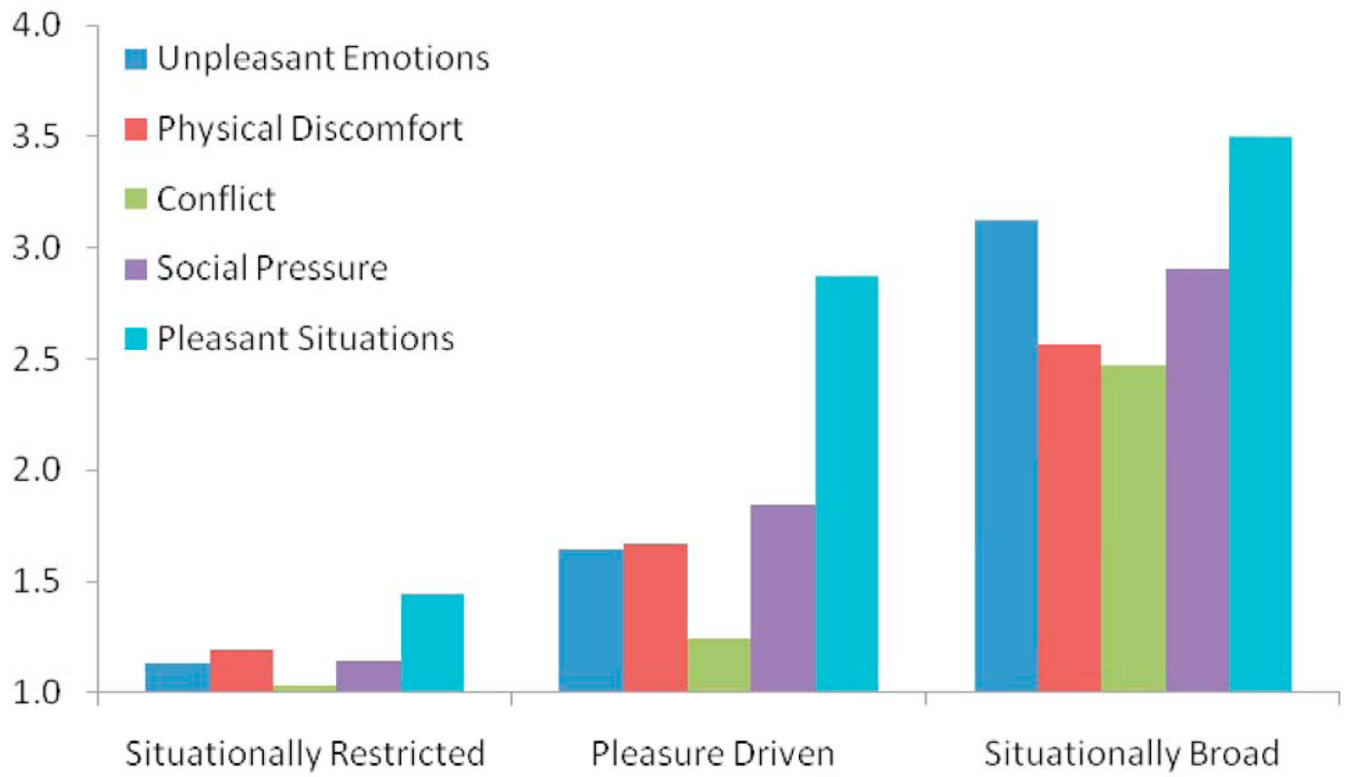
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**Figure 1.**  
Mean IDTS subscale scores across clusters at 12-month follow-up.

**Table 1**

## Demographic Characteristics at Baseline (N = 400)

Characteristics	N	percent
Men		
Heterosexual	100	25.0
Bisexual	14	3.5
Gay	86	21.5
Women		
Heterosexual	100	25.0
Bisexual	55	13.8
Lesbian	45	11.3
Race		
Caucasian	247	61.8
African American	26	6.5
Latino/a	77	19.3
Mixed and Other	50	12.4
Education		
Less than a four-year college degree	209	52.3
Four-year college degree or more	191	47.8
Income		
< \$29,999	254	63.5
> \$30,000	144	36.5
Employment		
Full-time, 40 hours/week	175	43.8
Part-time employment or less	225	56.2
Relationship status, self-defined		
Legally married	4	1.0
Partner/Lover/Girlfriend/Boyfriend	151	27.7
Single	245	61.3



**Table 2**

Demographic and External Variables across Clusters of Use Situations at 12-Month Follow-Up

	12 month			
	Restricted	Pleasure Driven	Broad	
N	138	141	39	
Age at Baseline	23.94(2.75)	24.11(2.79)	23.82(2.48)	F(2,314) =0.23
Gender				
Men	68(49.6%)	73(51.8%)	12(30.3%)	X <sup>2</sup> (2)=5.58
Women	69(50.4%)	68(48.2%)	27(69.2%)	
Sexual Orientation				
Heterosexual	67(48.9%)	76(53.9%)	16(41.0%)	X <sup>2</sup> (2)=0.34
GLB	70(51.1%)	65(46.1%)	23(59.0%)	
Ethnicity				
Hispanic	26(19.0%)	27(19.1%)	6(15.4%)	X <sup>2</sup> (2)=0.86
non-Hispanic	111(81.0%)	114(80.9%)	33(84.6%)	
Race				
White	93(67.9%)	89(63.1%)	21(53.8%)	X <sup>2</sup> (2)=2.69
non-White	44(32.1%)	52(36.9%)	18(46.2%)	
BSI	.50(.58) <sup>a</sup>	.73(.69) <sup>b</sup>	1.45(.85) <sup>c</sup>	F(2,292) =30.71**
Decisional Balance				
Pro	15.85(4.69) <sup>a</sup>	21.65(6.10) <sup>b</sup>	26.34(7.74) <sup>c</sup>	F(2,297) =60.57**
Con	14.84(5.84) <sup>a</sup>	17.40(6.25) <sup>b</sup>	26.13(8.92) <sup>c</sup>	
Drug instances				
0 to 4	100(72.5%) <sup>a</sup>	37(26.2%) <sup>b</sup>	3(7.7%) <sup>c</sup>	X <sup>2</sup> (2)=67.72**
5<	38(27.5%)	104(73.8%)	36(92.3%)	
Substance Dependence				
Yes	43(31.6%) <sup>a</sup>	90(63.8%) <sup>b</sup>	32(82.1%) <sup>c</sup>	X <sup>2</sup> (2)=44.66**
No	93(68.4%)	51(36.2%)	7(17.9%)	
Clustered variables				
Unpleasant Emotions	1.14(.21) <sup>a</sup>	1.65(.56) <sup>b</sup>	3.12(.73) <sup>c</sup>	F(2,315) =267.26**
Physical Discomfort	1.19(.27) <sup>a</sup>	1.67(.40) <sup>b</sup>	2.56(.87) <sup>c</sup>	F(2,315) =153.17**
Conflict	1.03(.08) <sup>a</sup>	1.24(.30) <sup>b</sup>	2.47(.78) <sup>c</sup>	F(2,315) =278.13**
Social Pressure	1.14(.22) <sup>a</sup>	1.84(.58) <sup>b</sup>	2.90(.86) <sup>c</sup>	F(2,315) =197.08**
Pleasant Situations	1.44(.50) <sup>a</sup>	2.87(.64) <sup>b</sup>	3.50(.78) <sup>c</sup>	F(2,315) =282.71**

NOTE: Within scales and categories, means having different superscripts differ from each other significantly at the  $p < .05$  level by Tukey comparison (for continuous variables) or Fischer's Exact tests (for categorical variables).

