

2008-01-01

# The Affective, Behavioral, and Cognitive Correlates of Club Drug Use among Hispanic College Students

Brenda Sue Hanson

University of Texas at El Paso, [bshanson@miners.utep.edu](mailto:bshanson@miners.utep.edu)

Follow this and additional works at: [https://digitalcommons.utep.edu/open\\_etd](https://digitalcommons.utep.edu/open_etd)



Part of the [Clinical Psychology Commons](#), and the [Other Psychology Commons](#)

---

## Recommended Citation

Hanson, Brenda Sue, "The Affective, Behavioral, and Cognitive Correlates of Club Drug Use among Hispanic College Students" (2008). *Open Access Theses & Dissertations*. 275.  
[https://digitalcommons.utep.edu/open\\_etd/275](https://digitalcommons.utep.edu/open_etd/275)

THE AFFECTIVE, BEHAVIORAL, AND COGNITIVE CORRELATES OF CLUB DRUG  
USE AMONG HISPANIC COLLEGE STUDENTS

BRENDA SUE HANSON

Department of Psychology

APPROVED:

---

Theodore V. Cooper, Ph.D., Chair

---

Harmon M. Hosch, Ph.D.

---

Oswaldo F. Morera, Ph.D.

---

Christian A. Meissner, Ph.D.

---

Sharon E. Thompson, Ph.D.

---

Patricia D. Witherspoon, Ph.D.  
Dean of the Graduate School

Copyright ©

by

Brenda Sue Hanson

2008

## **Dedication**

This dissertation is dedicated to my family. To my husband, Reid, without whose caring support and willingness to relocate for my dreams it would not have been possible. To my parents, who provided me with a strong Christian upbringing and valued the obtainment of higher education and to my siblings, who provided me with love and encouragement throughout this process.

THE AFFECTIVE, BEHAVIORAL, AND COGNITIVE CORRELATES OF  
CLUB DRUG USE AMONG HISPANIC COLLEGE STUDENTS

by

BRENDA SUE HANSON, M.A.

DISSERTATION

Presented to the Faculty of the Graduate School of

The University of Texas at El Paso

in Partial Fulfillment

of the Requirements

for the Degree of

DOCTOR OF PHILOSOPHY

Department of Psychology

THE UNIVERSITY OF TEXAS AT EL PASO

December 2008

## **Acknowledgements**

Portions of this work were supported by the NIMH M-RISP Grant No. 5 R24 MH47167-15.

I would like to thank Dr. Theodore V. Cooper for his encouragement, assistance, and much appreciated mentoring in the completion of this project. I would also like to thank the members of Patch Lab, for all their help in the collection, database management, and statistical consultation for this project.

In addition, I would like to thank the committee members, Drs. Harmon Hosch, Osvaldo Morera, Christian Meissner, and Sharon Thompson for their added insight and consideration.

## Abstract

Limited information exists about club drug use among minorities. This study examined potential affective, behavioral, and cognitive correlates of club drug use in a Hispanic college student sample. Participants ( $N = 321$ ) completed multiple measures assessing demographic information, acculturation, depression, anxiety, positive and negative affect, alexithymia, polysubstance use, sensation seeking, need for cognition, and prospective memory. Primary analyses included logistic regression models assessing the impact of affective, behavioral, and cognitive correlates on club drug use, while secondary analyses included moderation analyses exploring potential relationships between variables of interest, as well as assessment of univariate relationships between club drug use and study constructs. Eighteen percent of participants indicated club drug use. Increasing age and male gender were consistently related to club drug use. Within the affective model, none of the constructs were significantly related to club drug use; within the behavioral model, significant predictors included marijuana use ( $OR = 3.99, p = .01$ ) and sensation seeking ( $OR = 1.13, p < .001$ ); and within the cognitive model, prospective memory ( $OR = 1.56, p = .01$ ) was a significant correlate of club drug use. Need for cognition was found to moderate the relationship between sensation seeking and club drug use ( $OR = 1.01, p = .05$ ). Univariate tests demonstrated additional significant relationships between club drug use and alexithymia, smoking, and polysubstance use. These findings suggest the relative importance of behavioral and cognitive constructs in Hispanic college students' use of club drugs and provide researchers and healthcare providers avenues for future studies and prevention and intervention program development.

## Table of Contents

|  |    |
|--|----|
| Acknowledgements.....  | v  |
| Abstract.....  | vi |
| List of Tables.....  | ix |
| List of Figures.....   | x  |
| Chapter 1: Introduction.....   | 1  |
| 1.1 Prevalence of Substance Use Disorders .....  | 1  |
| 1.2 Description of Club Drugs.....   | 1  |
| 1.3 Reasons for Club Drug Use .....  | 2  |
| 1.4 Consequences of Club Drug Use.....   | 3  |
| 1.5 Club Drug Use and Mental Disorders .....   | 4  |
| 1.6 Club Drug Use and Gender.....  | 5  |
| 1.7 Club Drug Use among College Students .....   | 5  |
| 1.8 Hispanics and Club Drug Use.....   | 6  |
| 1.9 Affective Correlates of Club Drug Use .....  | 7  |
| 1.10 Behavioral Correlates of Club Drug Use.....                                       | 12 |
| 1.11 Cognitive Correlates of Club Drug Use.....  | 14 |
| 1.12 The Theoretical Underpinnings of Acculturation Stress on Club Drug Use.....       | 17 |
| 1.13 The Theoretical Underpinnings of Self-Medication Hypothesis on Club Drug Use..... | 19 |
| 1.14 The Theoretical Underpinnings of Cognitive Behavioral Therapy .....               | 22 |
| 1.15 The Present Study .....   | 24 |
| 1.16 Hypotheses.....   | 24 |
| Chapter 2: Method .....  | 28 |
| 2.1 Participants .....   | 28 |
| 2.2 Design .....   | 29 |
| 2.3 Measures .....   | 29 |
| 2.4 Procedure .....  | 36 |
| 2.5 Approach To Analysis .....   | 37 |
| Chapter 3: Results.....  | 40 |
| 3.1 Participant Characteristics .....  | 40 |
| 3.2 Univariate Analyses.....   | 40 |



|   |  |     |
|---|--|-----|
| 3.3   | Stepwise Logistic Regression Models .....                  | 40  |
| 3.4   | Moderation Analyses .....                                  | 41  |
| Chapter 4: Discussion .....   |  | 43  |
| 4.1   | Demographic Correlates .....                               | 43  |
| 4.2   | Acculturation .....  | 44  |
| 4.3   | Affective Correlates.....                                  | 44  |
| 4.4   | Behavioral Correlates .....                                | 46  |
| 4.5   | Cognitive Correlates .....                                 | 49  |
| 4.6   | Cognitive Behavioral Theory .....                          | 51  |
| 4.7   | Strengths .....  | 52  |
| 4.8   | Limitations.....   | 53  |
| 4.9   | Future Directions .....                                    | 53  |
| 4.10  | Implications for Prevention and Intervention Programs..... | 54  |
| 4.11  | Conclusion.....  | 55  |
| References.....   |  | 56  |
| Appendix A: Demographic Survey .....  |  | 99  |
| Appendix B: Acculturation and Rating Scale for Mexican Americans II (ARSMA-II)..... |  | 100 |
| Appendix C: Depression, Anxiety, and Stress Scale (DASS).....                       |  | 105 |
| Appendix D: Positive and Negative Affect Scale- Form X (PANAS-X).....               |  | 107 |
| Appendix E: Toronto Alexithymia Scale- 20 (TAS-20).....                             |  | 108 |
| Appendix F: Club Drug/Polysubstance Use Assessment .....                            |  | 110 |
| Appendix G: Sensation Seeking Scale- Form V (SSS-V).....                            |  | 116 |
| Appendix H: Need for Cognition- Short Form (NFC-SF).....                            |  | 119 |
| Appendix I: Prospective Memory Questionnaire (PMQ).....                             |  | 120 |
| Curriculum Vita.....  |  | 127 |

## List of Tables

|  |    |
|--|----|
| Table 1: Hypothesis .....  | 81 |
| Table 1: Hypothesis Continued .....  | 82 |
| Table 2: Participant Characteristics .....   | 83 |
| Table 2: Participant Characteristics Continued .....   | 84 |
| Table 2: Participant Characteristics Continued .....   | 85 |
| Table 3: Summary of Demographic Model for Club Drug Use .....  | 86 |
| Table 4: Summary of the Acculturation Stress Model for Club Drug Use .....   | 87 |
| Table 5: Summary of the Affective Model for Club Drug Use .....  | 88 |
| Table 6: Summary of the Behavioral Model for Club Drug Use .....   | 89 |
| Table 7: Summary of the Cognitive Model for Club Drug Use .....  | 90 |
| Table 8: Summary of the Hierarchical Logistic Regression Examining the Interaction Effects of Stress on Acculturation .....        | 91 |
| Table 9: Summary of the Hierarchical Logistic Regression Examining the Interaction Effects of Alexithymia on Anxiety .....         | 92 |
| Table 10: Summary of the Hierarchical Logistic Regression Examining the Interaction Effects of Alexithymia on Depression .....     | 93 |
| Table 11: Summary of the Hierarchical Logistic Regression Examining the Interaction Effects of Alexithymia on Negative Affect..... | 94 |
| Table 12: Summary of the Hierarchical Logistic Regression Examining the Interaction Effects of Need for Cognition on Anxiety.....  | 95 |
| Table 13: Summary of the Hierarchical Logistic Regression Examining the Interaction Effects of PMQ on PolyDrug Use.....            | 96 |
| Table 14: Summary of the Hierarchical Logistic Regression Examining the Interaction Effects of NFC on SSS.....                     | 97 |

## List of Figures

|   |    |
|---|----|
| Figure 1: Moderated Need for Cognition (centered NFC-SF) effect of Sensation Seeking (centered SSS) on probabilities of club drug use. .... | 98 |
|---|----|

# **Chapter 1: Introduction**

## **1.1 PREVALENCE OF SUBSTANCE USE DISORDERS**

Substance use disorders are among the most common mental health problems in the United States, with pooled 1-year and life-time rates estimated at 2.4 per 100 individuals for other than alcohol substance use disorders (Kessler et al., 1994). By 2020, it is predicted that 30,962,000 lives will be affected by diseases attributable to alcohol and illicit drug use compared to the 884,000 lives affected in 1990 (Murray & Lopez, 1996). Currently, there are an estimated 23 million Americans who struggle with a drug or alcohol problem (National Survey on Drug Use and Health (NSDUH), 2004). Treating substance use/abuse problems remains a challenge for mental health professionals (NSDUH, 2005; Mojtabai, Olfson, & Mechanic, 2002). The majority of substance users (rates up to 85%) do not feel that they need to receive treatment (NSDUH, 2005). Out of the remaining 15% who perceive a need for help, only 7% actually seek some type of healthcare, and only 3% seek this help from a mental health professional (NSDUH, 2005). Still others desire treatment but are unable to receive it due to lack of effort or ineligibility (e.g., insurance, cost) (NSDUH, 2005). Conservative estimates have placed the annual and societal costs associated with alcohol and drug use in the billions of dollars (Mark et al., 2005).

## **1.2 DESCRIPTION OF CLUB DRUGS**

Club drugs typically consist of 3, 4-methylenedioxymethamphetamine (MDMA, more commonly known as ecstasy), gamma-hydroxybutyrate (GHB), methamphetamine (speed), Ketamine, and lysergic acid diethylamide (LSD) (Banta-Green et al., 2005; Freese, Miotto, & Reback, 2002; National Institute on Drug Abuse, 2002). In addition, psilocybin mushrooms are often used in conjunction with these club drugs (McCaughan, Carlson, Falck, & Siegal, 2005). These drugs work on different mechanisms in the brain by acting as stimulants (MDMA; methamphetamine), hallucinogens (LSD, MDMA, psilocybin mushrooms), depressants (GHB), and anesthetics (GHB; ketamine) (for reviews, see Abraham, Aldridge, & Gogia, 1996; Freese et al., 2002). Due to the varied chemical compositions and resultant

psychotropic effects of club drugs, the classification of these drugs as “club drugs” is based on the circumstances under which they are used. Club drug use began recreationally by young people in night clubs (e.g., raves), concerts, or parties in order to increase physiological arousal and alter states of consciousness (Banta-Green et al., 2005; Parks & Kennedy, 2004). Today, however, a majority of lifetime users have never attended a rave, but rather use club drugs at their or a friend’s home (Fendrich, Wislar, Johnson, & Hubbell, 1998). It is also important that researchers regularly assess the typology of club drugs used at raves and parties as it can be expected that these patterns will continue to change over time thus modifying what is classified as club drugs. For example, preliminary findings at UTEP have suggested that the most commonly used club drug is psilocybin mushroom (15%) (Lopez, Resor, & Cooper, 2005) whereas other researchers have found high rates of LSD (43%) (Hopfer, Mendelson, Van Leeuwen, Kelly, & Hooks, 2006) and still others have found high rates of MDMA use (62%) (Banta-Green et al., 2005). Therefore, it is only through continued assessment that researchers will be able to determine the types and patterns of club drug use in various regions and among various ethnocultural groups.

### **1.3 REASONS FOR CLUB DRUG USE**

In addition to assessing the types of club drugs being used in each specific population, it may also be beneficial for researchers to examine the reasons why specific club drugs are being used. Many common reasons given for club drug use are experimentation (stimulant properties), enhancement of social and recreational activities (e.g., feels good, produces a good time with friends), relaxation, and escape from problems (Johnston, O’Malley, Bachman, & Schulenberg, 2005; Parks & Kennedy, 2004). Accessibility and lack of parental support are common reasons given for club drug use (i.e., MDMA, methamphetamine, ketamine) (Johnston et al., 2005; Loxton et al., 2008; Martins, Storr, Alexandre, &

Chilcoat, 2008a). By understanding why individuals are using club drugs, prevention and treatment programs can be tailored to provide individuals with healthier alternatives.

#### **1.4 CONSEQUENCES OF CLUB DRUG USE**

The consequences from heavy and regular use of these drugs can be categorized as psychological (e.g., anxiety, depression, impulsivity, hostility, aggression; dissociation, schizotypal symptomatology, psychosis and hallucinations ), physical ( e.g., nausea, shakiness, mood, sleep, memory, concentration), and social (e.g., impulsive, increased anxiety entering situations) (Curran & Morgan, 2000; Eisner & Cohen, 1958; Keyes, Martins, & Hasin, 2008; Levy, O'Grady, Wish, & Arria, 2005; Roiser & Sahakian, 2004). In general, research has found that methamphetamine users tend to report more consequences from their drug use than MDMA users (Krebs & Steffey, 2005). However in a recent study of MDMA users, 31.8% reported psychological problems, 10.2% reported physical problems, and 12.1% reported social problems (Rodgers et al., 2006). Following the use of club drugs, many users do not report these negative consequences until a day or two later (Verheyden, Henry, & Curran, 2003). Many club drug users report fear of damage to long-term health as a reason for discontinuing use (Verheyden, Henry, et al., 2003). Alarmingly, it is not until the use of these drugs produces actual physical concerns or the individual encounters financial problems that discontinuation of use tends to occur (Soellner, 2005; Verheyden, Henry, et al., 2003). For example, one study found that the majority (61.7%) of ex-MDMA users discontinued their use due to mental health issues (e.g., paranoia, anxiety, or depression) while the remaining 38.3% discontinued MDMA use due to circumstantial reasons (e.g., felt decreased quality of MDMA, loss of enjoyment in MDMA, or stopped clubbing) (Verheyden, Maidment, & Curran, 2003). These findings reiterate the importance of continued research that aids in the development of prevention and treatment programs to forestall the likelihood of the development of a mental disorder due to drug ingestion.

## 1.5 CLUB DRUG USE AND MENTAL DISORDERS

Although club drug use is not as prevalent as alcohol use (Johnston et al., 2005), many club drug users would meet diagnostic criteria for abuse and/or dependence (Cottler, Womack, Compton, & Ben-Abdallah, 2001). For example, Cottler et al. (2001), found that out of 173 youth who have reported MDMA use more than 5 times in their lifetime, 59% reported withdrawal symptoms, 43% met criteria for dependence with or without abuse, 34% met criteria for abuse only, while only 23% met neither abuse nor dependence criteria. In Germany, a random digit telephone survey found that of the lifetime MDMA users, 69% had been diagnosed with at least one mental disorder (Soellner, 2005). In addition, Soellner (2005) has suggested that every fifth person using MDMA at least once is likely to develop a relevant substance use disorder as diagnosed by the Diagnostic and Statistical Manual, 4<sup>th</sup> edition, text revision (American Psychiatric Association, 2000). Results from a national study (Keyes et al., 2008) suggest that current MDMA users are 3.7 times more likely to have an anxiety disorder and about 22 times more likely to abuse alcohol. Furthermore, females have been found to score higher on scales of psychopathology than males regardless of the drug used (Milani, Parrott, Turner, & Fox, 2004). The prevalence of psychological disorders among club drug users has led researchers to examine whether these disorders precede or follow the initiation of club drug use. An epidemiological study has suggested that anxiety, in particular, tends to precede drug use (Christie et al., 1988). For example, individuals who have experienced a major depressive disorder or anxiety episode are at twice the risk for later drug abuse or dependence (Christie et al., 1988). More recently, a longitudinal study has suggested that MDMA use is associated with a variety of mental disorders, and that in the majority of cases (88.4%) the onset occurred prior to the use of club drugs (Lieb, Schuetz, Pfister, von Sydow, & Wittchen, 2002). Therefore, it appears that the relationship between club drug use and mental disorders may be two-fold. That is, mental disorders may serve as a risk factor making it more likely that the individual will engage in club drug use, while the use of club drugs may result in a higher prevalence of mental disorders (Lieb

et al., 2002). More research is needed to determine if these differences are related to psychological disorders only or if social and personality factors are also implicated in club drug use.

## **1.6 CLUB DRUG USE AND GENDER**

Studies are mixed with regard to club drug use and gender. Numerous national studies have found club drugs use to be higher in males than females (Keyes et al., 2008; Substance Abuse and Mental Health Services Administration (SAMHSA), 2005, 2006) and relatively stable over time beginning in middle school (Goldsamt, O'Brien, Clatts, & McGuire, 2005). Additional research has suggested that males' use of MDMA is longer than females' (Verheyden, Henry, et al., 2003). However, recent research suggests a trend in the other direction, such that females between the ages of 16 and 21 are more likely to use than males, indicating that female use of club drugs has increased over time to exceed the rate of males (Wu, Schlenger, & Galvin, 2006). This variable is important to examine as it may be club drug specific. In Hong Kong for example, rates of MDMA and ketamine and polysubstance use have increased (37%, 70%, and 43% respectively); however, there appear to be certain combinations of club drugs specific to each gender such that 70% of females reported using both MDMA and ketamine whereas only 35% of males reported using both these drugs. A more recent study on club drug use in Hong Kong, found no significant differences between males and females for MDMA and ketamine use (Loxton et al., 2008). Therefore, it may be important to examine past and current drug use, as well as frequency of use by gender, so prevention and treatment programs can be tailored to include the combinations of club drugs specific for each gender.

## **1.7 CLUB DRUG USE AMONG COLLEGE STUDENTS**

College enrollment has increased over the past few decades, with an estimated 17 million students enrolled in colleges and universities in the United States (National Center for Education Statistics, 2005). Research has found that club drug use is increasing among high school and college



youth (Johnston et al., 2005) with 20% of youth having used at least one type of club drug (Wu et al., 2006). Results from national data have indicated that, in general, college students tend to use fewer illicit substances than those not in colleges; however, with club drug use this is not the case (Johnston et al., 2005). For example, Simons, Gaher, Correia, and Bush (2005), assessing a sample of 831 college students, found that 18% reported using club drugs in their lifetime, and 11% had used within the past 12 months. These figures are consistent with previous studies at UTEP which found prevalence rates between 17% to 26% (Lopez, Hu, Rodriguez Esquivel, Salgado, & Cooper, 2006; Lopez et al., 2005). A 4-year longitudinal study assessing students' intended and actual frequency of drug use, found that for MDMA use in particular, students' intended and actual use increased significantly with 35-46% having tried MDMA (McMillan & Conner, 2002). This suggests that students who use MDMA once are more likely to report and act on their intentions to engage in drug use. Positive attitudes towards drug use, have been found to be a risk factor for actual use for individuals as young as 16 (Martins et al., 2008b). Despite low club drug rates among college students in general, these rates should not be dismissed as minimal when considering the potential short and long term consequences of club drug use (e.g., social, psychological) (Curran & Morgan, 2000; Eisner & Cohen, 1958; Keyes et al., 2008; Levy et al., 2005; Roiser, Cook, Cooper, Rubinsztein, & Sahakian, 2005). Through understanding this unique relationship between college students and club drug use, prevention programs can be created to make it less likely that college students will initiate use. Additionally, treatment programs can be designed to address the variables specific to college students to decrease the chance that they will experience the potentially detrimental consequences of club drugs.

## **1.8 HISPANICS AND CLUB DRUG USE**

Hispanics are the fastest growing ethnic minority population in the United States (U.S. Census Bureau, 2006), and as such, more research is needed to examine substance use patterns among this

population (de la Rosa, Holleran, Rugh, & MacMaster, 2005). A longitudinal study of 1038 Hispanic or Latino 6<sup>th</sup> and 7<sup>th</sup> graders found that children who spoke English with their parents reported significantly higher rates of initiation and continued marijuana use as well as polysubstance use (Epstein, Botvin, & Diaz, 2001). Using language as a proxy for acculturation has resulted in findings that suggest that individuals who speak English (more acculturated) have a higher likelihood of drug use (e.g., marijuana, cocaine) (Amaro, Whitaker, Coffman, & Heeren, 1990).

Club drug use is increasing among Hispanic high school and college youth (Goldsamt et al., 2005; Johnston et al., 2005) and also appears to be more prevalent among highly acculturated Hispanics (Epstein et al., 2001). However, there are limited data assessing Hispanic club drug use among college students, despite the growing number of Hispanics using club drugs (Ford & Arrastia, 2008; Novoa, Ompad, Wu, Vlahov, & Galea, 2005; Ompad, Galea, Fuller, Phelan, & Vlahov, 2004; Rawson, Gonzales, & Brethen, 2002; Wu et al., 2006). For example, Ompad et al. (2004) found that 51.1% of Hispanic substance users reported using club drugs. More recent studies have found the rates of methamphetamine, MDMA, and LSD to be increasing in Hispanics with methamphetamine rates equaling that of Non-Hispanic Whites (Wu et al., 2006). This is of particular concern since Brecht, von Mayrhauser, and Anglin (2000) found that Hispanic methamphetamine users were likely to relapse in a short period of time. Therefore, more research is needed to understand the relationship between ethnicity, acculturation, and club drug use. By gaining this information, prevention and treatment programs can be tailored to the needs of club drug users within the Hispanic culture, thereby increasing the program's efficacy and reducing relapse rates.

## **1.9 AFFECTIVE CORRELATES OF CLUB DRUG USE**

Previous research has found that club drug users report higher levels of depressive symptomology than nonusers, with rates up to 40% (McCardle, Luebbers, Carter, Croft, & Stough,

2004; Roiser et al., 2005; Thomasius et al., 2005). Feeling depressed and having trouble concentrating are commonly reported symptoms of withdrawal from MDMA (Cottler et al., 2001). Depressive symptomology has been found to be related to the frequency of occasions for MDMA use (Parrott et al., 2002) and quantity of MDMA used (de Win et al., 2004). Interestingly, MDMA users tend to begin reporting these symptoms in mid-week (Verheyden, Henry, et al., 2003) and are likely to attribute their poor concentration, mood fluctuations, and depression to their MDMA use (Rodgers et al., 2006). Recent research, (Keyes et al., 2008) suggests mood disorders (e.g., major depression) were more common among ex-users than current users. The existence of depressive symptoms in ex-users indicates consequences of use are more than a rebound effect and most likely due to some type of drug-induced permanent damage to the brain's neurotransmitter system (MacInnes, Handley, & Harding, 2001; Roiser & Sahakian, 2004; Roiser et al., 2005; de Win et al., 2004). In a sample of current and former MDMA users, the most frequently diagnosed affective disorder was dysthymia (Thomasius et al., 2005). A recent longitudinal study examining the temporal relationship between club drug use and depression suggest that dysthymia occurs prior to the onset of club drug use (69%) whereas major depression commonly occurs after the initiation of use (40%) (Lieb et al., 2002). Thus, there appears to be a strong association between MDMA and mood disorders that should continue to be assessed. It appears that deficits in mental health due to drug use are apparent to club drug users as indicated by their likelihood to quit using due to mental health reasons (Curran & Morgan, 2000), and of the ex-users who quit due to mental health reasons, lifetime quantity consumed appears to be related to higher and more persistent levels of depression (Verheyden, Henry, et al., 2003). Therefore, programs that highlight these relationships to club drug users may potentially produce higher levels of cessation due to the club drug users' heightened awareness of these problems.

Anxious symptomology also tends to be higher in club drug users than nonusers (Milani et al., 2004). Polysubstance users, ex-ecstasy, and current ecstasy users have experienced substance-induced

anxiety. For example, 51% of all MDMA users have been found to have a current or past diagnosis of anxiety disorders (Lieb et al., 2002). Recently, Keyes et al. (2008) found that current MDMA users were 7.7 times more likely to be diagnosed with panic disorder. Additionally, Thomasius et al. (2005) found that the most frequently diagnosed anxiety disorders among a sample of current and former MDMA users were social and specific phobias. The relationship between club drug use and anxiety has been found to be significantly related to the number of occasions of use, with more occasions producing more anxiety in users (Parrott, Milani, Parmar, & Turner, 2001; Parrott et al., 2002). The temporal assessment between anxiety and drug use has uncovered mixed results. It is not uncommon for MDMA users to experience anxiety following the use of MDMA (Parks & Kennedy, 2004). A recent longitudinal study between MDMA use and anxiety suggested that depending on the type of anxiety disorder, 55-98% of cases preceded the onset of club drug use, while 23-30% follow the onset of club drug use (Lieb et al., 2002). Thus, increased knowledge of the relationship between anxiety and initiation and continued use of club drugs is needed in order to determine if anxiety serves as a risk factor or is a result of club drug use.

Negative affectivity is a mood-dispositional dimension included in most conceptualizations of temperament (for a review, see Rothbart & Ahadi, 1994). The concept of temperament refers to biological differences in reactivity and self-regulation that may be influenced by nature, nurture, and/or an interaction between nature and nurture (Rothbart & Ahadi, 1994). Negative affectivity occurs regardless of the situation and is not due to any specific overt stressor (Watson, 1988). Therefore, individuals high in negative affectivity tend to generally feel distressed, nervous, upset, and tense, whereas those low in negative affect tend to generally feel calm, peaceful, and serene (Watson & Tellegen, 1985; Watson, 1988). On the other hand, positive affect occurs due to a specific situation and reflects a person's level of pleasurable interaction with that situation (Watson, 1988). Individuals high in

positive affect tend to feel enthusiastic, alert, and determined, whereas individuals low in positive affect tend to feel lethargic and unmotivated (Watson & Tellegen, 1985; Watson, 1988).

Cooper, Frone, Russell, and Mudar (1995) found that students with high negative affect may be using alcohol as a maladaptive way to cope. A recent longitudinal study of high school students found negative affect to be related to higher rates of initial substance use and increased quantity over time for alcohol, tobacco, and marijuana use (Wills, Sandy, Shinar, & Yaeger, 1999). However, this same study also found positive affect to be related to a decrease in the use of these substances over time among students with high levels of positive affect, including those students who also have high levels of negative affect (Wills et al., 1999). A study among college students who reported using club drugs found negative affect to be positively associated with club drug use initiation; whereas positive affect was not related to use (Simons et al., 2005). These results taken together suggest that positive affect may have a unique interplay with substance use not by making it less likely that individuals will use, but rather reducing the likelihood that they will increase their use, whereas higher levels of negative affect do appear to make it more likely that the student will not only initiate substance use but also increase his/her use. These findings appear to be generalizable across drugs as these results were not limited to one specific substance, making it a priority for addiction researchers to continue to assess and monitor the relationship between affect and drug use.

Alexithymia is a personality construct in which an individual experiences difficulty in identifying and describing one's feelings and distinguishing those feelings from natural bodily sensations (Sifneos, 1973). Alexithymia has been defined as a multi-faceted construct comprised of the following distinct, yet logically related salient features: a) difficulty identifying feelings and distinguishing between feelings and bodily sensations of emotional arousal, b) difficulty describing feelings to others, c) constricted imaginal processes as evidenced by a paucity of fantasies, and d) a stimulus bound, externally oriented cognitive style (Taylor, Bagby, & Parker, 1997). Rates of

alexithymia have been found as high as 10% in the general population, and alexithymia is a major risk factor for a range of medical and psychiatric symptoms, including depression and anxiety (Taylor et al., 1997).

Alexithymia directly relates to dysfunctional aspects of emotional life increasingly recognized as central to addictive pathology (Cecero & Holmstrom, 1997) and is common in individuals with substance use disorders (Cleland, Magura, Foote, Rosenblum, & Kosanke, 2005; Speranza et al., 2004). It has been proposed that individuals with alexithymia may use substances as a coping mechanism to alter distressing affect as well as aid in the facilitation of verbal and emotional interactions with others, resulting over time in the development of substance abuse (Taylor et al., 1997). A high rate of alexithymia is prevalent among younger alcohol dependent males with shorter durations of abuse (Rybakowski, Ziolkowski, Zasadka, & Brzezinski, 1988), as well as patients with more general substance use disorders (Kauhanen, Julkunen, & Salonen, 1992). For example, alexithymia has been found to occur in 35.8% of alcohol or polysubstance users (Haviland, Hendryx, Shaw, & Henry, 1994), and also in 30% of people diagnosed with cannabis use or dependence (Troisi, Pasini, Saracco, & Spalletta, 1998). Alexithymia appears to be a stable trait unaltered by abstinence (de Timary, Luts, Hers, & Luminet, 2008; Pinard, Negrete, Annable, Audet, 1996), and a potential risk factor for relapse (Loas, Fremaux, Otmani, Lecercle, & Delahousse, 1997; Ziolkowski, Gruss, & Rybakowski, 1995).

Alexithymia has also been examined in the context of other measures being used in this study. In individuals with alcohol dependence, a positive association has been found between alexithymia and negative emotions such as depression and anxiety (Cox, Blount, & Rozak, 1998; Evren, Dalbudak, & Cakmak, 2008). One specific feature of alexithymia, inability to identify positive feelings, has been found to be positively associated with alcohol and drug use (Helmert & Mente, 1999). This same feature, as well as difficulty in describing feelings, has been found to be positively related to depression, indicating that symptom exacerbation of one leads to increases in the other (Saarijarvi, Salminen, &

Toikka, 2001). Researchers have also found a positive correlation between alexithymia and negative affect and a negative correlation with positive affect which suggests that individuals with alexithymia tend to have higher negative affect and lower positive affect (Parker Prkachin, & Prkachin, 2005). In addition, alexithymic alcohol dependent individuals appear to experience negative affect more intensely than nonalexithymic individuals with alcohol use disorders (Cox et al., 1998), suggesting it may be a risk factor for drug use. Alexithymia has not been examined in the context of club drug use; however, the high rates of alexithymia found in alcohol dependent individuals (Helmers & Mente, 1999), as well as cocaine dependent individuals (Keller, Carroll, Nich, & Rounsaville, 1995), suggest it as a logical potential correlate of club drug use.

#### **1.10 BEHAVIORAL CORRELATES OF CLUB DRUG USE**

Often times, individuals who use club drugs are more likely to have recently used other illicit substances as well (Barrett, Darredeau, & Pihl, 2006; Barrett, Gross, Garand, & Pihl, 2005; Goldsamt et al., 2005; Krebs & Steffey, 2005), making it more likely for the user to experience negative consequences due to polysubstance use (Maxwell & Spence, 2005). It is not uncommon for interactions to occur between clubs drugs and other illicit substances resulting in dependence, increased toxicity, drug overdose, and possible death (Banta-Green et al., 2005; Coffin et al., 2003; Schifano et al., 2003). Therefore, it is important for studies on club drugs to also assess the use of other illicit substances. Polysubstance use is commonly defined as more than one drug used in a specified time period (e.g., lifetime (Scholey et al., 2004); past 90 days (Boeri, Sterk, Bahora, & Elifson, 2008). Barrett et al. (2006) examined polysubstance use in 149 female college students and found that 58.7% were polysubstance users. On average, these students reported experience with 6.7 substances ( $SD = 3.42$ ) and reported consuming alcohol prior to the ingestion of other substances. Similar rates of polysubstance use have been found in other countries (e.g., Netherlands) (Smit, Monshouwer, & Verdurmen, 2002).

Research has found that polysubstance use among MDMA users tend to include other licit and illicit substances such as marijuana, amphetamines, and tobacco up to 59% of the time (Verheyden, Henry, et al., 2003). Other studies have found that MDMA users were also likely to use marijuana (68.5%), amphetamines (48.4%) and psilocybin mushrooms (3.2%) while using MDMA (Barrett et al., 2005). In addition heavy MDMA users are also more likely to use all other illicit substances, suggesting that there is a possible progression from legal drugs to cannabis to other illicit substances (Scholey et al., 2004).

The relationship between club drug use and marijuana should be noted. Research has found a strong pattern between marijuana use and the initiation of club drug use (for a review, see Compton, Thomas, Conway, & Colliver, 2005). In general, the use of any illicit substance tends to lead to a significant increase in use of other illicit substances; however, the strongest relationship has been found between marijuana and MDMA (Smit et al., 2002). Recent studies have found further support that those who use marijuana are more likely to use club drugs (Ford & Arrastia, 2008; Krebs & Steffey, 2005; Simons et al., 2005) with high rates of marijuana use predicting higher rates of club drugs (Simons et al., 2005). Interestingly, Boeri et al. (2008) found that MDMA users preferred using marijuana while taking MDMA to enhance its effects as well as an aid when coming down from MDMA (45.7% and 48.9% respectively). Elevated rates of marijuana use have also been found in ketamine users such that during ketamine initiation, 25% used marijuana, and 20% have continued to use marijuana while using ketamine (Lankenau & Clatts, 2005). Therefore this relationship appears to be important in understanding club drug use initiation and can be further understood through continued research.

Sensation seeking is a temperament dimension characterized by the tendency to seek novel and stimulating experiences (Zuckerman, 1994). Sensation seeking has been associated with the use of many illicit substances from prescription drugs (Low & Gendaszek, 2002), MDMA (Low & Gendaszek, 2002), to other drugs (Wills, Windle & Cleary, 1998) suggesting that those high in sensation seeking are



more likely to use drugs than those low in sensation seeking (Martins et al., 2008a; Zuckerman, Neary, & Brustman, 1970). An early study examining the relationship between sensation seeking and club drug use found sensation seeking to be a powerful predictor of initial use as well as number of drugs used for both licit and illicit drugs (Arducci, Archer, Pancoast, & Gordon, 1989). More recently, Simons et al. (2005) did not find a relationship between sensation seeking and club drug use initiation, but did find sensation seeking to be a significant predictor of club drug use frequency. Therefore, it appears that sensation seeking is related to the frequency of club drug use once initiated, but the relationship to club drug use initiation remains unclear. Possibly, this unique relationship varies by the type of drug used. For example, Thompson, Anglin, Emboden, and Fisher (1985) suggested that individuals who use psilocybin mushrooms are more inclined to engage in sensation seeking behaviors, as suggested by their increased use of other licit and illicit substances). This may be of significant concern at UTEP, as psilocybin mushroom use was the highest used club drug among a sample of the student population (Lopez et al., 2005). Possibly, given the high rates of psilocybin mushroom use and its suggested relationship to sensation seeking, UTEP students may actually be engaging in a higher frequency of club drugs than previously found. Continued research in this area, will determine what, if any, relationship exists between psilocybin mushroom use and sensation seeking as well as if sensation seeking is related to the initiation and frequency of club drug use in this population.

### **1.11 COGNITIVE CORRELATES OF CLUB DRUG USE**

The need for cognition is a cognitive motivational construct that has been defined as “an individual’s tendency to engage in, and enjoy effortful cognitive activities” (Cacioppo & Petty, 1982). Research has found no significant differences in Non-Hispanic White and Hispanic scores on measures of need for cognition (Culhane, Morera, & Hosch, 2004). However, further research has suggested that measures of need for cognition may be partially measurement invariant across Non-Hispanic White and

Hispanic samples such that certain loadings have been found to vary across the groups (Culhane, Morera, & Watson, 2006). The need for cognition has been found to be positively associated with sensation seeking (Olson, Camp, & Fuller, 1984) and negatively associated with anxiety (Mueller & Johnson, 1990; Olson et al., 1984). Hittner (2004) examined the relationship between need for cognition, expectations, and drinking behavior among college students. The findings indicated that for females, levels of moderate to heavy drinking were associated with lower need for cognition scores; however, no relationship was found between need for cognition scores and drinking levels in males. In addition, need for cognition was found to moderate the strength of the relationship between expectancies and drinking behavior such that as need for cognition increased, the strength of relationship between expectancies and drinking behavior increased (Hittner, 2004). In the context of drug use, the need for cognition has not been examined. Therefore more research is needed regarding the relationship between need for cognition and illicit substances to determine under what circumstances, if any, it serves as a risk or protective factor for club drug use, as well as its relationship between genders and different illicit substances.

The recreational use of club drugs has been associated with a variety of memory problems (for a review, see Freese et al., 2002). Previous studies have found significant impairment in memory among club drug users; however, these findings are primarily among heavy club drug users and not recreational users (McCardle et al., 2004). Additional studies on cognition have also found deficits in learning and attention tasks (McCardle et al., 2004). Ketamine, for example, has been shown to produce cognitive deficits on verbal fluency, immediate recall, preferentially delayed word recall, and postdistraction recall, with the effect on nonverbal declarative memory being dose-dependent such that larger doses of Ketamine produce early occurring deficits in nonverbal declarative memory (Krystal et al., 1994). MDMA has also been shown to produce increases in cognitive and memory problems as the quantity of MDMA ingested increases (Parrott et al., 2002; Thomasius et al., 2005). For example, MDMA users

have been found to be significantly impaired on tasks of recognition and spatial working memory (Fox et al., 2002). In addition, MDMA users report noticing these changes in memory and are fully aware of their memory difficulties (Parrott et al., 2002). These deficits in memory have been shown to be long-lasting. A recent study found that over 50% of current and ex-users reported experiencing memory problems, particularly in the area of immediate and delayed recall (Thomasius et al., 2005).

Prospective memory is the ability to remember to perform future actions and has only recently been studied in the context of club drugs use (Hannon, Adams, Harrington, Fries-Dias, & Gipson, 1995). After controlling for other drug use and strategies used to remember, Heffernan, Ling, and Scholey (2001) found that MDMA users were significantly more likely to report global impairments in prospective memory than non-MDMA users. In another study, Heffernan, Jarvis, Rodgers, Scholey, and Ling (2001) again found that MDMA users were significantly more impaired in not only global impairments of prospective memory but also in short-term habitual and long-term episodic memory after controlling for other drug use and that these deficits were not due to a more general increase in reported cognitive failures. A more recent internet survey of MDMA users provided further support that MDMA use is associated with deficits of long-term episodic memory (Rodgers et al., 2003). Mixed results on internally cued prospective memory have been found suggesting it may not be affected until a possible threshold of drug use is reached (Heffernan, Jarvis, et al., 2001). Previous research has also found deficits in prospective memory in marijuana users as well (Rodgers et al., 2001; Rodgers et al., 2003). Due to a high comorbidity between marijuana and club drug use, the deficits in prospective memory may reflect some aspect of polysubstance use (Montgomery & Fisk, 2007). The recency of the development of measures to assess prospective memory, as well as the recent application of these measures to club drugs, illustrates the need to further assess the relationship between club drug use and prospective memory across specific and polysubstance drugs as well as across different groups of users (e.g., minorities, college students).

## **1.12 THE THEORETICAL UNDERPINNINGS OF ACCULTURATION STRESS ON CLUB DRUG USE**

Acculturation has been defined as a process of attitudinal and behavioral changes (Marin & Marin, 1991) that results from contact with a new culture's affects, behaviors, norms, and values (Gordon, 1964). As a result, people may change with regard to their language use, cognitions, personality, identity, attitudes, and levels of stress (Berry, 1980). In seeking a theoretical mechanism for understanding the relationship between Hispanics and club drug use, the Acculturative Stress Model may provide a complementary framework (Johnson, VanGeest, & Cho, 2002). The acculturation stress model or acculturation strain model posits that reductions in the health status of an individual may be due to the acculturation process and may include physical, psychological, and social aspects (Berry, Kim, Minde, & Mok, 1987). This model focuses on the role stress plays in the acculturation process (Neff, Hoppe, & Perea, 1987). Thereby, it is not just assumed that someone who is acculturating will experience high levels of substance use, but rather the individual who feels that the acculturation process is stressful will be vulnerable to engage in problem behaviors. Some examples of acculturative stress may include lowered mental health status, feelings of marginality and alienation, heightened psychosomatic symptom levels, and identity confusion (Berry et al., 1987). Feeling distanced from one's own culture as well as the majority's beliefs and lifestyles may also produce stress (Neff et al., 1987). Gilbert and Cervantes (1986) suggest that the frequency of substance use is the result of these stressors that accompany the process of acculturation. For example, length of time in the United States has been found to be significantly correlated with the likelihood of exhibiting a psychiatric disorder as well as using substances (Neff & Hoppe, 1992; Vega, Gil, & Zimmerman, 1993). In addition, higher rates of drug use and loss of family support have been found to be related to higher acculturative stress; however, these same factors have also been related to drug use in Mexico (Medina-Mora et al., 2001). This indicates the possibility of contradictory evidence regarding the role of acculturative stress and the development of substance abuse. Supporting this possibility, Arciniega, Arroyo, Miller, and Tonigan

(1996) found no relationship between acculturation, acculturative stress, and alcohol frequency or quantity, suggesting that it may not be the process of acculturation, but rather, possibly a process or component involved in acculturation that results in substance use. Additionally, the strength of the model in explaining substance abuse among minorities may be gender specific. For example, a three generation study of Mexican Americans found that in the middle generation drinking rates were highest for males and higher for females in the younger generation (Markides, Ray, Stroup-Benham, & Trevino, 1990).

Thereby some researchers have begun to refer back to the simple acculturation model first proposed by Gilbert and Cervantes (1986), which posits that substance consumption patterns of Mexican-Americans will reflect the extent to which they have adopted the norms and practices of the referent group (typically non-Hispanics). It is typically thought this type of acculturation will occur temporally, such that the longer an individual is in the United States (as measured by number of years or successive generations) the more likely substance use patterns will match that of the majority group. Early studies supported the notion that assimilation would produce drug use patterns similar to that of the majority (typically non-Hispanic) (Gilbert & Cervantes, 1986; Neff et al., 1987; Neff & Hoppe, 1992). More recently, results from a national survey have provided support that in general Non-Hispanic Whites, African Americans, and Hispanics display similar rates of drug abuse, alcoholism, and need for mental health care (Wells, Klap, Koike, & Sherbourne, 2001). To support this, Johnson et al. (2002) have suggested that the process of acculturation and subsequent levels of drug abuse should be thought of as non-linear, thereby allowing the relationship between stressors and acculturation to be tested, as well as examining other variables related to drug use that may be independent of acculturation (Johnson et al., 2002). Taken together these findings suggest that the role of acculturation among Hispanic UTEP students is a reasonable and logical variable to be examined in order to understand better the use of club drugs among this population. This study should be considered a first step in examining the tenets

underlying the acculturation stress theory. If the acculturation-stress theory holds true, future studies can begin to examine this relationship longitudinally and tailor prevention and treatment programs to address culturally relevant variables.

### **1.13 THE THEORETICAL UNDERPINNINGS OF SELF-MEDICATION HYPOTHESIS ON CLUB DRUG USE**

Among the various theoretical underpinnings of addictive behaviors, Khantzian's self-medication hypothesis (SMH) has received the most support over the past 30 years from psychologists and biological researchers (for a review, see Markou, Kosten, & Koob, 1998). The SMH proposes that people use addictive substances in order to experience relief from existing psychiatric or emotional states (Khantzian, 1985). Thereby, the drugs used are specifically chosen (possibly through experimentation) and repeatedly used to alleviate the management of these problems (e.g. anger, anxiety, depression) (Khantzian, 2003). As a result, the main action of the drug, the personality of the individual, and their inner states of psychological distress interact to aid in the decision of the drug used (Khantzian, 2003). Several studies have indeed suggested that preexisting psychological distress may be the precursor to abuse (Aharonovich, Nguyen, & Nunes, 2001). Subsequently, as psychiatric or emotional states increase, the risk for substance use relapse increases (Khantzian, 1997). More recently, Khantzian has further expanded this theory to include other affective states (e.g., negative affect, alexithymia) (1997). A recent study of 70 methadone users did not find a relationship between negative affect and methadone use, but did find higher levels of anxiety prevalent in methadone users. (Hall & Queener, 2007); however, more research is warranted to confirm this finding.

Blume, Schmaling, and Marlatt (2000) reexamined this model from a behavioral perspective and demonstrated how it may be viewed in terms of intermittent negative reinforcement whereby substance use is engaged in to subdue symptom exacerbation. As a result, this process provokes a rebound-type effect where substance use may produce or increase psychiatric symptoms. This idea aids in explaining

why individuals continue to use substances even though their relief from psychiatric symptoms is limited (Weingartner, Robinson, Fogel, & Gruman, 2002). Recently, Tomlinson, Tate, Anderson, McCarthy, and Brown (2006) found that prior to relapse, all participants reported experiencing psychiatric symptoms, and 25% were actually found to have improvement in global functioning immediately following drug use. These results support the notion that self-medication may be a feasible theory for the use of drugs and that some individuals may actually show improvement following drug use.

Research on the self-medication hypothesis has primarily been examined within the context of anxiety and depression (Milani et al., 2004). For example, adults with major depressive episodes or anxiety disorders are at twice the risk for later abuse (Christie et al., 1988). The relationship between anxiety and alcohol use has been well-established in the literature (for a review, see Lepine & Pelissolo, 1998). Individuals have reported that they use alcohol specifically to reduce their anxiety (Chutuape & de Wit, 1995). Katernadahl and Realini (1999) found that anxiety symptoms preceded drug use. Additionally, Swendsen et al. (2000) found that anxiety related states were predictive of subsequent alcohol use and that males, in particular, were more likely to consume alcohol when experiencing nervousness than females. However, in a longitudinal study of 12, 15, and 18 year olds, Hansell and White (1991) found there to be no relationship between psychological distress and subsequent drug use; whereas in a more recent longitudinal study, nervous mood was predictive of subsequent alcohol consumption (Swendsen et al., 2000). Therefore, Damphousse and Kaplan (1998) urge researchers to look at possible mediators (e.g., deviant behavior) between psychological distress and later drug use such that these other factors may result in increased levels of psychological distress and subsequent drug use.

When examining this relationship in the context of depression a similar picture emerges. Recent research suggests that drug abuse may follow the onset of depression in an effort to improve their

symptoms (Abraham & Fava, 1999). However, drug abusers have also reported a perceived mood elevation following ingestion (Weiss, Griffin, & Mirin, 1992). Markou et al. (1998) have suggested that this relationship between drug abuse and depression may be biologically based in that repeated drug use may actually mediate the symptoms of depression. Recent evidence suggests that some individuals may be experiencing depression prior to drug use, whereas for others, depression occurs as a result of drug use (Keyes et al., 2008; Lieb et al., 2002).

The application of this model to club drug use has just recently begun. Thomasius et al. (2005) did not find anxiety or depression to be unusually frequent in MDMA users as compared to nonusers. However, Verheyden, Maidment, et al. (2003) suggest that MDMA is used by some as an attempt to control depression. A recent longitudinal study showed that those with mental disorders at baseline were more likely to later use MDMA than those who did not have a mental disorder at baseline; however, for some individuals, anxious and depressive symptomology may be the cause of drug use and for others may be the result of drug use (Lieb et al., 2002). Additional research in examining the temporal relationship between affective states and club drug use will assist in determining the appropriateness of applying the self-medication hypothesis to club drug use.

Regardless of the specific mechanism in which self-medication operates, national studies have consistently found that individuals who abuse illicit substances other than marijuana and alcohol are more likely to have unmet health care needs (Harris & Edlund, 2005). Therefore, regardless of whether drug use is the product of or precursor to depression and anxiety, it is plausible to assume that individuals may engage in self-medicating in an effort to experience relief from existing psychiatric or emotional problems. This study does not intend to test this theory in its entirety but rather seeks to examine if club drug use among college students is influenced by affective correlates, as proposed by the self-medication hypothesis. If so, knowledge of individuals' psychological states prior to substance use may provide useful for prevention campaigns, understanding drug initiation, and designing



treatments that are cognitively based (e.g. successive approximations; harm reduction) and result in higher rates of long-term cessation.

#### **1.14 THE THEORETICAL UNDERPINNINGS OF COGNITIVE BEHAVIORAL THERAPY**

In the early 1960's, two independent researchers, Albert Ellis and Aaron Beck, proposed that people's thoughts, beliefs, and assumptions about their situations and environment influence their emotional experience (Beck, 1964; Ellis & Harper, 1961). Originally, cognitive behavioral therapy (CBT) was implemented to treat the affective disorders of anxiety and depression (Beck, 1964; Beck, Emery, & Greenberg, 1985; Ellis, Harper, & Powers, 1975). Since that time, CBT has become recognized as an effective, short-term, and empirically valid treatment for a variety of psychological disorders (Beck, & Freeman, 1990; Beck, Freeman, & Davis, 2004; Butler, Chapman, Forman, & Beck, 2006). The underlying theories of CBT are grounded in social learning theories and principles of conditioning (Barrington, 2006; Carroll, 1998; McMullin & Giles, 1981). The cognitive facet focuses on the mind and the relationship between cognitions and resultant feelings and behaviors (Ledley, Marx, & Heimberg, 2005). It is assumed that individual beliefs impact our thoughts, and as a result, a variety of reactions from different individuals will arise in any given situation (Ledley et al., 2005). The behavioral facet states that all behavior can change as a result of learning through classical or operant conditioning (Ledley et al., 2005). CBT is therefore a collaborative process of examining the way a person constructs and understands the world, as well as an evaluation of the process by which a person acts on those cognitions (Freeman & Freeman, 2005). Thus, it is not surprising that CBT has been shown to be effective even among individuals with challenging temperaments and personalities (e.g., alexithymia, negative affect) (Jones & Pulos, 1993; Rosenblum, Cleland, Magura, Mahmood, & Kosanke, 2005). CBT does not refer to one specific protocol for treatment but rather a variety of treatments that share common features (Barrington, 2006; Butler et al., 2006). These features include functional analysis and

skills training procedures (Barrington, 2006; Carroll, 1998; Marlatt & Gordon, 1985; Miltenberger, 2007). A functional analysis is a process that results in generating information on the events that precede and follow the target behavior in order to determine the events associated with the occurrence of the problem behavior (Miltenberger, 2007). This can be done indirectly (e.g., questionnaires, interviews) or directly (e.g., direct observation) (Miltenberger, 2007). Therefore in order to develop an appropriate intervention, CBT relies heavily on the knowledge about the affective, behavioral, and cognitive correlates related to the problem behavior (Miltenberger, 2007). Skills training teaches the individual to recognize the situations or states in which drug use is most likely to occur and how to avoid these situations or cope if they cannot be avoided (Marlatt & Donovan, 2005). Building off of the knowledge gained from a functional assessment, skills training procedures are tailored so that the correlates related to the problem behavior can be addressed (Marlatt & Donovan, 2005).

Following the theoretical background of CBT, proponents view substance dependence as a set of learned behaviors acquired through experience (Marlatt & Donovan, 2005). For example, if a substance provides a desired effect (e.g., good feelings, tension reduction, euphoria) on repeated occasions, it may become the preferred way of achieving those outcomes (Marlatt & Donovan, 2005), particularly if the person lacks other ways to produce the effect. Meta-analyses and extensive reviews have shown CBT to have strong empirical support for the treatment of alcohol disorders (Miller & Wilbourne, 2002), cannabis dependence (Marlatt & Donovan, 2005), tobacco-dependent users (Hall, Munoz, & Reus, 1994; Zelman, Brandon, Jorenby, & Baker, 1992), cocaine-dependent users (Maude-Griffin et al., 1998; Rohsenow, Monti, Martin, Michalec, & Abrams, 2000), and other drug using populations (Baker & Lee, 2003; Bux & Irwin, 2006). In addition, CBT has been shown to have robust evidence for the treatments of substance abuse in adolescents (Crome, 2006).

Although the proposed study is not an intervention, the information gathered is similar to a functional assessment by providing information on the events that occur prior to and after club drug use

via relevant correlates. It is after this type of assessment that future studies can develop state-of-the-art tailored prevention and intervention programs aimed at reducing club drug use in Hispanic college students.

### **1.15 THE PRESENT STUDY**

Due to the increasing prevalence and harmful side effects, it is imperative to begin to develop prevention and treatment programs specific to club drugs to reduce the likelihood of initiation and continued use. Moreover, these programs will be better received when tailored to encompass specific regional and cultural variations (e.g., myths, beliefs, as well as drugs common to the area) (Fiore et al., 2000). One such way is to assess the importance of acculturation and stress on the use of club drugs in Hispanics. In order for these programs to be successful it is also important to know the potential correlates related to club drug use. Therefore, the focus of this study is the relationship between affective, behavioral, and cognitive constructs and club drug use among Hispanic college students. The affective correlates examined in this study were depression, anxiety, stress, positive and negative affect, and alexithymia (i.e., lack of emotional expressiveness). The behavioral correlates included in this study were polysubstance use and sensation seeking. The cognitive correlates in this study were need for cognition and prospective memory.

### **1.16 HYPOTHESES**

Hypotheses were designed from a theoretical perspective to add to the current literature by providing a more systematic examination of variables possibly related to club drug use among Hispanic college students.

The first hypothesis was designed to assess if the facets of the acculturation-stress theory (Berry et al., 1987) aid in understanding club drug use among Hispanic college student. Based off this theory, it

was hypothesized that higher acculturation levels and higher levels of stress would predict a higher likelihood of club drug use (see Table 1).

Given the recent application of the SMH (Khantzian, 1985, 1997) on understanding club drug use (Thomasius et al., 2005; Verheyden, Maidment, et al., 2003) and the high rates of anxiety (Lieb et al., 2002) and depression (McCardle et al., 2004) typically found among club drug users, the second hypothesis was designed to assess the relationship of these affective states and club drug use among Hispanic college students. As such, it was hypothesized that higher levels of depression, anxiety, stress, negative affect, and alexithymia would predict a higher likelihood of club drug ever use, while higher levels of positive affect would predict a lower likelihood of club drug ever use (see Table 1).

Cognitive behavioral theories stress the importance of understanding which behaviors individuals are engaging in before programs can be designed to prevent or deter use (Ledley et al., 2005). Previous literature has found that club drug users are more likely to be polysubstance users (Verheyden, Henry, et al., 2003) as well as sensation seekers (Arducci et al., 1989, Simons et al., 2005). The third hypothesis was designed to assess the consistency of these findings in a Hispanic college sample. Therefore, it was hypothesized that polysubstance users and those individuals with higher levels of sensation seeking would be more likely to use club drug use (see Table 1).

Cognitive behavioral theories also stress the importance of determining one's view on the use of club drugs, and how these cognitions influence drug use (Ledley et al., 2005). Previous literature has found a relationship between need for cognition and alcohol use (Hittner, 2004) as well as higher deficits in prospective memory associated with club drug use (Heffernan, Jarvis, et al., 2001; Rodgers et al., 2003). The fourth hypothesis was designed to assess the potential relationship between cognitive correlates and club drug use among Hispanic college students. It was hypothesized that lower levels of need for cognition and higher levels of prospective memory would predict higher levels of club drug ever use (see Table 1).

In addition moderated effects assessing the influence of acculturation, anxiety, depression, negative affect, sensation seeking, and polysubstance use on club drug use were examined. The types of moderators proposed in this study should be thought of as “Quasi” moderators, as they are not expected to be unrelated to the criterion, but rather have been included to test theoretical assumptions (Sharma, Durand, & Gur-Arie, 1981).

As mentioned earlier, it is unclear how acculturation and stress impact the use of substances (Arciniega et al., 1996; Vega et al., 1993). To test the appropriateness of the acculturation-stress theory (Berry et al., 1987) on the use of club drugs in this population, it was predicted that individuals who view the process of acculturation as stressful would most likely use club drugs.

The recent application of the self-medication hypothesis on club drug use illustrates the need for more research in demonstrating the relationship between drug use, personality, and the inner states of psychological distress (Khantzian, 2003; Verheyden, Henry, et al., 2003). The elevated levels of emotional distress (e.g., anxiety, depression, and negative affect) found in alexithymic individuals (Cox et al., 1998; Evren et al., 2008; Saarijarvi et al., 2001) suggest that the added affective deficit of alexithymia may place these individuals at greater risk for substance use (Cox et al., 1998). It was therefore predicted that individuals who were anxious, depressed, or experiencing negative affect would most likely use club drugs if they also had higher levels of alexithymia.

The underlying theories of CBT stress the importance of understanding the relationship between a person’s cognitions and subsequent behaviors (Ledley et al., 2005). Need for cognition has been found to be correlated with anxiety (Mueller & Johnson, 1990) and sensation seeking (Olson et al., 1984) which in turn have been found to be associated with club drug use (Arducci et al., 1989, Simons et al., 2005; Thomasius et al., 2005). Additionally, because anxiety, sensation seeking, and need for cognition each relate to facets of cognitive behavioral theories (Barrington, 2006; Beck, 1964; Ledley et al., 2005), it seems reasonable to expect that variations in need for cognition would influence the other constructs

(i.e., anxiety, sensation seeking) relationship with club drug use. Therefore it was predicted that anxious or sensation seeking individuals with low levels of need for cognition would most likely use club drugs. To expand previous research findings on the positive relationship between physical problems (e.g., memory) and drug use (Freese et al., 2002; Maxwell & Spence, 2005), it was predicted that polysubstance users with deficits in prospective memory would most likely use club drugs.

## Chapter 2: Method

### 2.1 PARTICIPANTS

For this study, 423 students were recruited from the University of Texas at El Paso undergraduate classes (388 Psychology students, 35 Health Science students). Inclusion criteria included university enrollment and being eighteen years of age or older. An independent samples t-test indicated a significant difference in age between the psychology students ( $M = 21.11$ ,  $SD = 5.47$ ) and health science students ( $M = 25.65$ ,  $SD = 7.57$ ) ( $t(419) = -4.482$ ,  $p < .001$ ), prompting the removal of the health science students from analyses. Participants who were not Hispanic ( $n = 64$ ) were removed from subsequent analyses, reducing the sample size to 324. In addition, three participants were removed for not meeting inclusion criteria. The final sample size used for analyses was 321 Hispanic students.

A priori power analyses were computed given alpha level, power, and effect size. Previous data collected at UTEP included only affective and behavioral correlates of club drug use. This study also assessed the relationship between club drug use and cognition; therefore a power analysis was conducted from a previous study (Heffernan, Jarvis, et al., 2001) using the Prospective Memory Questionnaire (Hannon et al., 1995). A G\*Power 3.0.3 a priori power analysis (Faul, Erdfelder, Lang, & Buchner, 2007) was computed for each of the three subscales' means and standard deviations, with the subscale producing the largest  $n$  reported. An independent samples  $t$ -test between ecstasy users ( $M = 4.35$ ,  $SD = 1.84$ ) and controls ( $M = 3.09$ ,  $SD = 1.18$ ) for the internally cued subscale determined 322 participants would be needed to discover a large effect ( $d = .82$ ) at alpha = .05 and beta = .80. In order to ensure this sample size would provide adequate power for other variables included in the study, G\*Power 3.0.3's a priori power analyses (Faul et al., 2007) were conducted for an affective (i.e., anxiety) and behavioral (i.e., sensation seeking) correlate. Using the proportions for anxiety of ecstasy users (51%) and nonusers (32%) from the Lieb et al. (2002) article, it was determined 299 participants would be needed to discover a large effect (difference in proportions = .20) at alpha = .05 and beta = .80. An independent

samples *t*-test of score between club drug users ( $M = 17.73$ ,  $SD = 4.79$ ) and controls ( $M = 13.33$ ,  $SD = 5.73$ ) on the Sensation Seeking Scale (Zuckerman, Eysenck, & Eysenck, 1978) from the Loxton et al. (2008) article determined 74 participants would be needed to produce a large effect ( $d = .83$ ) at alpha = .05 and beta = .80.

## **2.2 DESIGN**

The design of this study was cross sectional in nature. This study sought to test a set of independent variables that may be associated with club drug use. Independent variables for this study consisted of the affective, behavioral, and cognitive correlates thought to be related to club drug use. The dependent variable for this study, club drug use, was dichotomized into use versus no use. More specifically, this study was interested in the relationship between age, gender, acculturation, depression, anxiety, stress, positive and negative affect, alexithymia, polysubstance use, sensation seeking, need for cognition, and prospective memory on use of club drugs. Continuous independent variables consisted of age, acculturation, depression, anxiety, stress, positive and negative affect, alexithymia, sensation seeking, polysubstance use, need for cognition, and prospective memory. Categorical independent variables consisted of gender, smoking, drinking, marijuana use, and polysubstance use.

## **2.3 MEASURES**

*Demographic Questionnaire.* Participants were asked to provide demographic information such as age, gender, ethnicity, college grade level, and Greek involvement. See Appendix A.

*Acculturation Rating Scale for Mexican Americans- II (ARSMA-II).* Participants' level of acculturation was assessed through the ARSMA-II (Cuellar, Arnold, & Maldonado, 1995). This scale assesses acculturation level on a continuum through an orthogonal, multidimensional approach by independently measuring cultural orientation toward Mexican and Anglo cultures. The ARSMA-II assesses the frequency in which a participant engages in activities such as speaking, reading, listening,



and writing in English versus Spanish as well as the degree in which the person ethnically identifies himself/herself and the degree of interaction with European Americans. Scale 1 of the ARSMA-II consists of 30 items on a 5 point Likert-type format with 1 = “not at all” and 5 = “extremely often or almost always.” This scale can be deconstructed further to contain a Mexican Oriented Scale (MOS) which is comprised of 13 of the items and an Anglo Oriented Scale (AOS) which is comprised of the remaining 17 items, with higher scores on each of these measures indicating more of that specific dimension. To obtain an overall acculturation score the mean MOS is subtracted from the mean AOS with lower scores indicating more of a Mexican orientation, and higher scores indicating more of an Anglo orientation. Each score is placed into one of five categories of acculturation level based on the raw mean score obtained: a) very Mexican oriented ( $<-1.33$ ), b) slightly Mexican oriented bicultural ( $-1.33$  to  $-.069$ ), c) slightly Anglo oriented bicultural ( $-.07$  to  $1.18$ ), d) strongly Anglo oriented ( $1.19$  to  $2.45$ ), e) very assimilated/Anglicized ( $>2.45$ ). The test-retest reliability for the MOS and AOS are .96 and .94 respectively. The internal reliability for the MOS and AOS scales have been found to be adequate ( $\alpha = .86$  and  $\alpha = .88$ , respectively). Similar results were found in this study ( $\alpha = .76$  and  $\alpha = .93$ , respectively). This instrument has also been found to have good concurrent validity with the original scale ( $r = .89$ ). This study maintained the continuous value of the mean total overall score in subsequent analyses, and the results are discussed in terms of the raw mean scores of acculturation. See Appendix B.

*Depression, Anxiety, and Stress Scale (DASS).* The DASS scale is a 42 item scale that contains three scales of 14 items each designed to measure the emotional states of depression, anxiety, and stress (Lovibond & Lovibond, 1993). The Depression scale assesses dysphoria, hopelessness, devaluation of life, self-deprecation, lack of interest, anhedonia, and inertia. The Anxiety scale assesses autonomic arousal, skeletal muscle effects, situational anxiety, and subjective experiences of anxious effect. The Stress scale assesses chronic non-specific arousal such as difficulty relaxing, nervous arousal, and being

easily upset/agitated, irritable/over-reactive and impatient. Items are scored on a 4 point severity or frequency scale (question dependent) assessing experience of each state “over the past week” with 0 = “Did not apply to me at all” to 3 = “Applied to me very much, or most of the time.” The 14 items within each scale are summed and can range from 0 to 42, with higher scores indicating a higher degree of that emotional state. An overall score can also be calculated to obtain an overall level of negative emotional symptoms. Cut-off scores created predominantly through student samples are based on percentile scores with ratings from normal to extremely severe, with scores of 0-78 classified as normal, 78-87 as mild, 87-95 as moderate, 95-98 as severe, and 98-100 as extremely severe. The DASS was designed for researchers and clinicians and can be administered in individual or group format. This scale has been found to have good internal reliability in both nonclinical and clinical populations: Depression ( $\alpha = 0.91$ ;  $\alpha = 0.97$  respectively), Anxiety ( $\alpha = 0.84$ ;  $\alpha = 0.92$ ); and Stress ( $\alpha = 0.90$ ;  $\alpha = 0.91$ ) (Antony, Bieling, Cox, Enns, & Swinson, 1998; Lovibond & Lovibond, 1993). High internal consistency was also demonstrated in the current study: Depression ( $\alpha = 0.94$ ), Anxiety ( $\alpha = 0.86$ ), and Stress ( $\alpha = 0.91$ ). Depression, anxiety, and stress often correlate strongly with each other; however, the DASS has demonstrated the ability to discriminate between these constructs (Brown, Chorpita, Korotitsch, & Barlow, 1997; Crawford & Henry, 2003; Lovibond & Lovibond, 1995). A principal components analysis replicated the Depression, Anxiety, and Stress scales, and a confirmatory factor analysis indicated a three factor solution as the best fit for the data (Crawford & Henry, 2003). Lastly the DASS has been shown to have strong convergent validity in both clinical and nonclinical populations with a wide range of assessment measures of depression (e.g.,  $r = .81$  with Beck Depression Inventory), anxiety (e.g.,  $r = .74$  with Beck Anxiety Inventory), and stress scales (e.g.,  $r = .60$  with Penn State Worry Questionnaire) (Antony et al., 1998; Brown et al., 1997; Lovibond & Lovibond, 1995). For this study, the total scores on the depression, anxiety, and stress subscales were used in analyses. Results are discussed in terms of total scores. See Appendix C.

*Positive and Negative Affect Schedule-Expanded Form (PANAS-X)*. The PANAS-X is a 60 item scale on a 5-point Likert scale (1 = “very slightly or not at all”; 5 = “extremely”) assessing experience of the mood descriptors “during the past two weeks” (Watson & Clark, 1992). Eleven scales were developed to measure the following emotional experiences: Fear, Sadness, Guilt, Hostility, Shyness, Fatigue, Surprise, Joviality, Self-Assurance, Attentiveness, and Serenity (Watson & Clark, 1994). These scales can be summarized further into two higher order scales of Positive and Negative Affect each consisting of 10 items. Scores for the Positive and Negative Affect Scale are obtained by averaging the summation of the ratings. The possible range of scores for both the Positive and Negative Affect scale are 1 to 5, with higher scores indicating higher levels of the respective affect. The internal reliabilities have been found to be high consistently across populations for the Positive (ranging from  $\alpha = .83$  to  $.90$ ) and Negative Affect (ranging from  $\alpha = .85$  to  $.90$ ) scales. Similar internal reliabilities were found for this study as well: Positive Affect ( $\alpha = 0.82$ ) Negative Affect ( $\alpha = 0.87$ ). The scales and subscales have demonstrated adequate convergent (Bagozzi, 1993; Watson & Clark, 1992; Watson & Clark, 1994) and discriminate validity (Watson & Clark, 1992) as well as moderate test-retest reliabilities for Positive ( $r = .42$ ) and for Negative Affect ( $r = .43$ ) (Watson & Clark, 1992; Watson & Clark, 1994). Subsequent analyses assessed the mean total scores for both the positive and negative affect subscales. See Appendix D.

*Toronto Alexithymia Scale-20 (TAS-20)*. The Tas-20 is the most widely used measure of alexithymia (Bagby, Parker, & Taylor, 1994). The TAS-20 consists of 20 self-descriptive statements on a 5-point Likert scale ranging from 1 = “strongly disagree” to 5 = “strongly agree.” The TAS-20 consists of three subscales and an overall total score demonstrating sufficient internal consistency in student and psychiatric samples: difficulty in identifying feelings (DIF;  $\alpha = .79$  and  $.81$  respectively), difficulty describing feelings (DDF;  $\alpha = .75$  and  $.75$  respectively), externally oriented thinking (EOT;  $\alpha = .66$  and  $.64$  respectively), and TAS-20 total score ( $\alpha = .80$  and  $.83$  respectively) (Bagby, Parker, et al., 1994).

Similar internal consistency scores have been found in substance using populations (Cleland et al., 2005; Parker, Taylor, & Bagby, 2003). Replication of the three-factor model has occurred in clinical and nonclinical samples (Loas, Corcos, et al., 2001) and across cultures (Taylor, Bagby, Parker, 2003). Scores are obtained by reverse coding five items and summing them with higher scores indicating greater alexithymic tendencies. Cutoff scores have been empirically derived such that scores 51 and below represent low alexithymia levels, scores 52 to 61 represent moderate alexithymia levels, and 61 to 100 represent high alexithymia levels (Taylor et al., 1997). This instrument has also demonstrated adequate convergent and discriminant validity in university samples and concurrent validity in university samples (Berthoz, Ouhayoun, Perez-Diaz, Consoli, & Jouvent, 2000) as well as in clinical samples (Bagby, Taylor, Parker, 1994). The present study also demonstrated good internal reliability ( $\alpha = .80$ ). Subsequent analyses maintained and discussed the results in terms of the continuous value of the total overall score. See Appendix E.

*Club Drug/Polysubstance Assessment.* An instrument developed by Hopfer et al. (2006) was used to assess club drug use as well as polysubstance use. Areas covered in this instrument include demographics, lifetime and past month use, location of obtainment and use of drugs, information on purchase price and quantity, frequency of peer group use, and polysubstance use. Questions are asked in a consistent pattern of open and categorical options for each of the drugs. Open ended questions consist of number of days in past 30 days the drug was used, age of first use, how much of the drug was bought at each time, and price of the drug at purchase. Categorical questions consist of lifetime use, where the drug was obtained, where the drug was used, and how often the drug was purchased. Due to the nature of this questionnaire and the recency of its development, it has not been subject to psychological assessment; however its use in past studies similar in nature to this one, make it the most reasonable measure to use. With the authors' permission, this questionnaire was be altered to include questions concerning mushroom use, alcohol use, and cigarette use to ensure that all drugs known to the researcher

in this population were assessed (Lopez et al., 2005). Club drug use, smoking, drinking, marijuana use, and polysubstance use were obtained from this measure. Club drug use was determined through endorsement of having ever used in his/her lifetime one or more of the club drugs: Ecstasy, GHB, Ketamine, LSD, Methamphetamine, and Psilocybin Mushrooms. Smoking was determined through endorsement of having a puff or more of a cigarette in his/her lifetime. Drinking was determined through lifetime use. If students endorsed having ever used more than one of the following substances: cigarettes, alcohol, and marijuana, they were coded as polysubstance users. See Appendix F.

*Zuckerman's Sensation Seeking Scale Form V (SSS-V)*. The SSS-V is a forced choice 40 question measure comprised of four 10-item subscales: Thrill and Adventure Seeking (TaAS), Experience Seeking (ES), Disinhibition (Dis), and Boredom Susceptibility (BS) (Zuckerman et al., 1978). The (TaAS) consists of items describing desires to engage in sports or activities involving some type of physical danger or risk. The ES consists of items expressing a desire to seek new experiences through the mind and senses. The Dis consists of items measuring disinhibiting behavior in social situations by drinking, partying, or seeking variety in sexual partners. The BS consists of items measuring an aversion for repetitiveness of any kind including routine work, or even dull and predictable people. It is a forced choice questionnaire in that each item has two sentence choices: a and b. Depending on the circled choice, the person either receives a score of one or zero for that item. Raw scores can be computed for each of the subscales as well as a total score by summing the scores for each of the items within each of the scales, with higher scores indicating more of a need for sensation seeking. The raw scores can then be converted into t-scores for males and females separately. The SSS-V has shown adequate psychometric properties including construct and convergent validity and reliability (Olson et al., 1984; Roberti, Storch, & Bravata, 2003; Zuckerman, 1994). It has also demonstrated adequate internal reliability for the Total score (men,  $\alpha = .84$ , women,  $\alpha = .85$ ), TaAS (men,  $\alpha = .77$ , women,  $\alpha = .77$ ), ES (men,  $\alpha = .61$ , women,  $\alpha = .61$ ), Dis (men,  $\alpha = .74$ , women,  $\alpha = .76$ ),

and BS (men,  $\alpha = .57$ , women,  $\alpha = .56$ ) (Zuckerman, 1994). Similar results have been found in a UK sample: TaAS ( $= .91$ ), ES ( $= .79$ ), Dis ( $= .83$ ) (Gray & Wilson, 2007). Comparable internal reliability was also found for the total score in this sample ( $\alpha = .79$ ). Replication of the four-factor model has been found in clinical and non-clinical samples (Loas, Verrier, et al., 2001). The total score for this instrument was used in subsequent analyses. See Appendix G.

*Need for Cognition Short Form (NFC-SF)*. The NFC-SF measures individuals' tendency to engage in and enjoy effortful thinking (Cacioppo, Petty, & Kao, 1984). The NFC-SF consists of 18 multiple choice questions on a 4 point Likert scale ranging from 1 = "strongly disagree" to 4 = "strongly agree." Nine items on this scale are reversed scored. The possible range of scores is from 18 to 72 with higher scores indicating more need for cognition, lower scores indicating less engagement or enjoyment in effortful cognitive activities. The internal reliability of this scale has been found to be relatively high across community and college samples ranging from .83 to .91 (Cacioppo et al., 1984; Cacioppo, Petty, Feinstein, & Jarvis, 1996; Hittner, 2004). This study found equivalent internal reliability ( $\alpha = .85$ ). This instrument has been found to demonstrate adequate test-retest reliability ( $r = .88$ ) (Sadowski & Gulgoz, 1992) as well as convergent and discriminant validity (Cacioppo et al., 1996). The total score for this instrument was used in subsequent analyses. See Appendix H.

*Prospective Memory Questionnaire (PMQ)*. The PMQ is a 52 item self-report measure that assesses participants' prospective memory (PM). It requires participants to recount errors in the previous week, month, or year for short (14 items) and long (14 items) term PM, internally cued PM (10 items), as well as a number of strategies used to aid memory (14 items) (Hannon et al., 1995). Long term cued PM is described as memory cues that occur hours or days beforehand, and the task is not regular or routine. Short term cued PM occurs when the cue to do something is minutes before the task is carried out or is more routine or everyday. Internally cued PM occurs when memory is cued internally. Strategies to remember is comprised of activities used to aid in remembering. Each statement is on a 9

point Likert-type horizontal scale. The left end-point (never), middle-point (2 times/) and right end-point (4 or more times /) asks respondents to answer questions on the basis of week 33 times, month 18 times, and year once. Each scale ranges from 1 = “forgetting is infrequent or few techniques are used” to 9 = “great deal of forgetting occurring or high number of memory strategies are used.” Scores are obtained by averaging the summation of the ratings. The possible range of scores is 1 to 9, with higher scores indicating more deficits in prospective memory. The total scale has shown adequate internal validity ( $r = .76$ ) and test-retest reliability ( $r = .88$ ) as well as adequate test-retest reliability for the subscales ranging from .64 to .88. This scale has also demonstrated adequate internal reliability for the total scale ( $\alpha = .92$ ) and subscales with alphas ranging from .78 to .90. The present study also demonstrated high internal reliability ( $\alpha = .91$ ). The mean PMQ total score was used in subsequent analyses. See Appendix I.

## **2.4 PROCEDURE**

After Institutional Review Board approval was obtained, students registered in undergraduate courses were recruited. Participants read and were explained an informed consent concerning their rights as a participant and the risks and benefits associated with participating. Signing the consent form indicated participants’ understanding of these rights. After informed consent was obtained, participants were administered the survey packet. Survey packets were partially counterbalanced (Gravetter & Forzano, 2006) into eight different packet orders, with each survey starting the series following the demographic questionnaire. The orders of the remaining questionnaires were determined using an online random number generator (Urbaniak & Plous, 2008). This was done to reduce the likelihood of order and carryover effects. Additionally, data was collected in groups, so it was hoped that receipt of different ordered packets would encourage students to answer honestly and accurately given the sensitive nature of this topic. Following completion, each participant was debriefed, received

information regarding the counseling center on campus if needed, and received research and/or extra course credit for participating in the study.

## **2.5 APPROACH TO ANALYSIS**

Simple descriptive statistics, such as frequency distributions and measures of central tendency, were generated to gather basic characteristics of the sample. Continuous predictors were assessed for normality using the criterion (skewness < 2, kurtosis <10) recommended by Cohen, Cohen, West, and Aiken (2003). To correct for violations of normality for age (skewness = 3.33 and kurtosis = 13.15), it was necessary to create the log of age (LogAge) ( $M = 3.02$ ,  $SD = .17$ ), which was used in subsequent analyses. A correlation matrix of all the independent variables indicated some large (e.g., depression and stress,  $r = .71$ ,  $p = .01$ , anxiety and stress,  $r = .69$ ,  $p = .01$ ), moderate (e.g., smoking and marijuana use,  $r = .48$ ,  $p = .01$ , prospective memory and anxiety,  $r = .35$ ,  $p = .01$ ), and small (e.g., gender and prospective memory,  $r = .06$ ,  $p = .18$ ), acculturation and sensation seeking,  $r = .13$ ,  $p = .05$ ) relationships between independent variables. To ensure that correlations between the independent variables did not violate assumptions of regression analyses, collinearity diagnostics among the independent variables for each of the logistic regression models and moderations were assessed. Multicollinearity was deemed a nonissue as none of the predictors had a Variance Inflation Factor (*VIF*) above 10 (Cohen et al., 2003).

Univariate tests were conducted to assess the relationship between each independent variable and club drug use (1 = used at least one club drug in lifetime, 0 = never used a club drug in lifetime).  $X^2$  analyses were conducted for each of the categorical variables (i.e., gender, smoking, drinking, marijuana use, and polysubstance use) and *t*-tests were conducted for each of the continuous variables (i.e., LogAge, acculturation, depression, anxiety, stress, positive affect, negative affect, alexithymia, sensation seeking, need for cognition, and prospective memory). To reduce the likelihood of Type 1



error, the Bonferroni correction technique was employed for both the categorical ( $p < .05/5 = .01$ ) and continuous variables ( $p < .05/11 = .0045$ ). Only significant predictors are reported.

Stepwise logistic regressions assessed the relationship between the independent variables of affective, behavioral, and cognitive correlates on the dependent variable club drug use. The independent demographic variables of LogAge, gender, and acculturation (ARSMA-II) were entered in the first step and retained in subsequent models. The first regression analysis explored the odds of having used club drugs by acculturation (ARSMA-II) and stress (DASS Stress subscale); therefore the variable of stress was added in the second step. The subsequent regressions provided models for the affective, behavioral, and cognitive correlates of club drug use. The affective model included the total scores on depression (DASS Depression subscale), anxiety (DASS Anxiety subscale), stress (DASS Stress subscale), positive affect (PANAS-X Positive Affect subscale), negative affect (PANAS-X Negative Affect subscale), and alexithymia (TAS-20) in the second step. The behavioral model included the variables of smoking, drinking, marijuana use, and polysubstance use as well as total scores on sensation seeking (SSS-V) in the second step. The cognitive model included the total scale scores for need for cognition (NFC-SF) and prospective memory (PMQ) in the second step. All analyses were conducted using SPSS 15.0 (SPSS Inc, 2006).

Moderation analyses were conducted in line with Baron and Kenny (1986). All continuous variables were centered on the mean to reduce multicollinearity between the variables and their product terms (Cohen et al., 2003; Jaccard, Wan, & Turrisi, 1990). Interaction terms were created by multiplying the centered predictor with the moderator. Variables were entered into the equation in two blocks: 1) predictor and moderator term; 2) interaction term, to determine if the interaction term significantly improved the overall fit of the model. A significant interaction term signified the presence of the moderated effects between variables.

The first moderation analysis examined whether increased levels of stress (DASS Stress subscale) moderated the link between acculturation (ARSMA-II) and club drug use. The second moderation analysis examined whether increased alexithymia (TAS-20) moderated the link between anxiety (DASS Anxiety Subscale) and club drug use. The third moderation analysis examined whether increased alexithymia (TAS-20) moderated the link between depression (DASS Depression Subscale) and club drug use. The fourth moderation analysis examined whether increased alexithymia (TAS-20) moderated the link between negative affect (PANAS-X Negative affect subscale) and club drug use. The fifth moderation analysis examined whether low need for cognition (NFC-SF) moderated the link between anxiety (DASS Anxiety subscale) and club drug use. The sixth moderation analysis examined whether low need for cognition (NFC-SF) moderated the link between sensation seeking (SSS-V) and club drug use within a logistic regression framework. The seventh moderation analysis examined whether prospective memory (PMQ) moderated the link between polysubstance use and club drug use within a logistic regression framework.

## Chapter 3: Results

### 3.1 PARTICIPANT CHARACTERISTICS

Table 2 illustrates participant characteristics. The average participant was 20.7 years old ( $SD = 4.32$  years), female ( $n = 210$ ), predominantly Mexican American ( $n = 254$ ), and only a minority were members of a Greek organization ( $n = 23$ ). The most commonly reported club drugs used were Ecstasy ( $n = 37$ ) and Psilocybin Mushrooms ( $n = 25$ ). High lifetime rates of cigarette (63.2%), alcohol (93.1%), and marijuana (48.9%) use were reported in this sample. Nineteen percent of participants had used club drugs, while 69% reported polysubstance use (use of marijuana, alcohol, and/or cigarettes). Participants were slightly Anglo oriented ( $M = .38$ ,  $SD = 1.20$ ), reported lower levels of depression ( $M = 7.14$ ,  $SD = 8.07$ ), lower levels of anxiety ( $M = 7.68$ ,  $SD = 6.80$ ), lower levels of stress ( $M = 11.85$ ,  $SD = 8.57$ ), moderate levels of positive affect ( $M = 2.04$ ,  $SD = .68$ ), moderate levels of negative affect ( $M = 3.46$ ,  $SD = .77$ ), moderate levels of alexithymia ( $M = 46.05$ ,  $SD = 10.88$ ), moderate levels of sensation seeking ( $M = 20.08$ ,  $SD = 6.01$ ), high levels of need for cognition ( $M = 50.57$ ,  $SD = 7.74$ ), and lower levels of prospective memory deficits ( $M = 2.75$ ,  $SD = .92$ ).

### 3.2 UNIVARIATE ANALYSES

The categorical correlates of gender,  $\chi^2(1) = 7.53$ ,  $p < .01$ , smoking,  $\chi^2(1) = 14.53$ ,  $p < .001$ , marijuana use,  $\chi^2(1) = 34.77$ ,  $p < .001$ , and polysubstance use,  $\chi^2(1) = 16.34$ ,  $p < .001$  were found to be associated with club drug use. The continuous predictors of LogAge,  $t(316) = -3.01$ ,  $p = .004$ , and sensation seeking,  $t(289) = -5.25$ ,  $p < .001$  were found to be associated with club drug use.

### 3.3 STEPWISE LOGISTIC REGRESSION MODELS

The demographic model (i.e., LogAge, gender, acculturation) was significant,  $\chi^2(3) = 17.88$ ,  $p < .001$ , with a reported Nagelkerke  $R^2 = .09$  (see Table 3). For each unit increase in LogAge, there was a

greater likelihood of club drug use,  $OR = 11.14, p < .01$ . Males were 2.16 times more likely than females to have used club drugs,  $p = .01$ .

For the acculturation stress model, the entry of stress in the second step did not significantly improve the overall fit of the model,  $\Delta X^2 (1) = .40, p = .53$ , (see Table 4).

The addition of the affective correlates (i.e., DASS (Depression, Anxiety, and Stress subscales), PANAS X (Positive and Negative Affect subscales), and TAS-20) did not significantly improve the fit of the model,  $\Delta X^2 (6) = 7.21, p = .30$ , (see Table 5). Depression was marginally significant,  $p = .06$ . For each unit decrease on scores of depression, there was a .93 times greater likelihood of club drug use. This result should be cautiously interpreted given the lack of improvement in the fit of the model as well as the lack of statistical significance at the .05 level of the individual predictor.

The entry of the behavioral correlates (i.e., smoking, alcohol use, marijuana use, polysubstance use, and SSS) in the second step significantly improved the overall fit of the model,  $\Delta X^2 (5) = 34.50, p < .001$ , (see Table 6). Marijuana users were 3.99 times more likely to use club drugs,  $p = .01$ , and for each unit increase on scores of sensation seeking, there was a 1.13 times greater likelihood of club drug use,  $p = .001$ .

The entry of the cognitive correlates (NFC and PMQ) in the second step significantly improved the overall fit of the model,  $\Delta X^2 (2) = 8.17, p < .05$ , (see Table 7). For each unit increase on scores of prospective memory, there was a 1.56 times greater likelihood of club drug use,  $p = .01$ .

### **3.4 MODERATION ANALYSES**

The following moderations were nonsignificant: Acculturation X Stress (see Table 8), Anxiety X Alexithymia (see Table 9), Depression X Alexithymia (see Table 10), Negative Affect X Alexithymia (see Table 11), Anxiety X Need for Cognition (see Table 12), Polysubstance Use X Prospective Memory (see Table 13).

Need for cognition was found to moderate the relationship between sensation seeking and club drug use (see Table 14). The entry of the interaction term significantly improved the overall fit of the model,  $\Delta X^2(1) = 3.75, p = .05$  (see Figure 1). Consistent with the behavioral model, the predictor for this moderation (i.e., sensation seeking) was a significant predictor of club drug use,  $p < .001$ . However, the moderator term (i.e., need for cognition) was not a significant predictor of club drug use,  $p = .56$ . Sensation seekers who have a high need for cognition were 1.01 times more likely to use club drugs. Therefore, although sensation seekers were more likely to use club drugs,  $OR = 1.16$ , a higher probability of club drug use existed among those who also have high levels of need for cognition.

## Chapter 4: Discussion

A nontrivial amount (18.8%) of club drug use was reported. Similar lifetime rates have been found nationally (20%; Wu et al., 2005) and locally, here at UTEP (17-26%; Lopez et al., 2005, 2006). Unlike other UTEP studies, the most commonly reported club drugs were ecstasy (11.5%) followed by psilocybin mushroom (7.8%). These differences may be accounted for by the use of different measures to assess club drugs, inclusion of other ethnicities in past studies, or possibly a reflection of particular drug accessibility. The consistent reported lifetime rate of club drug use attests to the importance of continuing this line of research.

### 4.1 DEMOGRAPHIC CORRELATES

Consistent with previous literature, the demographic variables of age and gender were found to be associated with club drug use (Smit et al., 2002; Keyes et al., 2008; SAMSHA, 2006). The reported first use in this study and others (Johnston et al., 2005; Wu et al., 2006) was between the ages of 15 and 19. Previous studies have suggested that nonuse of illicit substances prior to 20-22 years of age decreases the likelihood that a person will initiate use (Kandel & Logan, 1984; Yamaguchi & Kandel, 1984b). Among current users, age appears to influence the frequency of use with older individuals consuming less often, but in larger doses, possibly due to tolerance (Verheyden, Henry, et al., 2003; Thomasius et al., 2005). Therefore older age may be a protective factor against initiation of club drug use (e.g., less opportunities, more responsibilities); whereas younger age may be a risk factor for increased levels of use in current users (e.g., more opportunities, easier accessibility). The higher likelihood of club drug use among males may be more reflective of a cultural factor not assessed in this study (e.g., traditional gender roles). For example, *Machismo*, a Mexican traditional gender role characterized by a strong or exaggerated sense of masculinity expressed through courage and invulnerability (Neff, 2001), is one possible explanation substance use is more prevalent among Hispanic males than females

(McCreary, Newcomb, & Sadave, 1999). These results taken together suggest that prevention programs may need to be tailored for junior high aged males and females, whereas intervention programs may need to be tailored for high school aged male students prior to entering the University setting. Future studies should examine the role of club drug use from a traditional gender role viewpoint to assess the relevance of this cultural factor for future prevention and intervention programs.

## **4.2 ACCULTURATION**

Inconsistent with hypotheses, the overarching finding was that neither acculturation, stress, nor an interaction of these two factors was associated with club drug use in this sample. As such, results from this study are incongruent with both the acculturation stress hypothesis (i.e., viewing the acculturation process as stressful leads to deficits in health behaviors; Berry et al., 1987) and the simple acculturation model (i.e., substance patterns are a reflection of referent group; Gilbert & Cervantes, 1986). One possibility is that the process of acculturation may be different in cities in close proximity to Mexico. Unique to U.S./Mexico border city environments, Hispanics are able to simultaneously be exposed to both cultures. Participants reported being “slightly Anglo oriented.” Therefore, it is possible given the location of this study, that at this level of acculturation, attitudes and beliefs have been internalized to reflect identity in both cultures (Lechuga, 2008). Thus, acculturation based constructs may be less relevant in border cities whereas demographic variables (e.g., age, gender) may be more relevant.

## **4.3 AFFECTIVE CORRELATES**

Inconsistent with hypotheses and previous studies, this study showed a lack of support for affective constructs predicting or moderating club drug use (Lieb et al., 2002). Furthermore, these results demonstrated a lack of support for the SMH (Khantzian, 1985) as a mechanism for understanding club drug use in Hispanic college students. This study found that the affective correlates of stress, anxiety,

affect, and alexithymia were not related to club drug use, adding to the inconsistency in the literature among these constructs and club drug use (Keyes et al., 2008; Lieb et al., 2002). Depression was marginally significant, and opposite of the predicted direction. Given that the overall model was not significant, these results should be interpreted cautiously. Low to moderate reported levels of these constructs were reported, suggesting that this sample was reporting emotional and psychological stability and not using club drugs to experience relief from these states as proposed by the SMH (Khantzian, 1985). Rather, it may be that students in this sample were using club drugs for recreational or indulgent purposes as opposed to coping or self-medication purposes. The context in which club drugs are used (e.g., raves, night clubs) (Banta-Green et al., 2005; Parks & Kennedy, 2004), suggest that the use of these drugs is more common in individuals who are not experiencing psychological distress (e.g., depression, anxiety) but rather in those who are seeking an altered consciousness in a social setting. Possibly, observed levels of these states may have resulted in an inability of study measures to adequately differentiate between club drug users and non users. Perhaps the most likely explanation for these findings is that affective constructs are far more implicated in current users' quantity and frequency of use (Keyes et al., 2008; Lieb et al., 2002; Parrot et al., 2001, 2002; Thomasius et al., 2005) rather than experimentation or initiation of club drug use. Future studies should continue to assess the relationship of these variables with different levels of use (e.g., frequency, quantity, length) and in different populations (e.g., clubs, Juarez) as well as continue to assess these relationships, perhaps considering other theoretical models that account for more social-emotional factors, such as Social Networking models (Kobus, 2003; Simons-Morton, 2007). However, the SMH may prove to be useful if applied to future prospective studies in relevant subgroups of this population (e.g., club drug users; clinically oriented subsamples).



#### 4.4 BEHAVIORAL CORRELATES

Consistent with hypotheses and the literature, smoking, marijuana use, and polysubstance use were found to be related to club drug use (Barret et al., 2006; Compton et al., 2005; Ford & Arrastia, 2008; Verheyden, Henry, et al., 2003; Yamaguchi & Kandel, 1984b,); however only marijuana use remained significantly related to club drug use in the overall behavioral model. Previous research has suggested that marijuana use is a risk factor for initial club drug use as well as increased rates of club drug use over time (Simons et al., 2005; Smit et al, 2002). Yamaguchi and Kandel (1984a) proposed that illicit drug use results from a pathway of progression from legal (alcohol or cigarettes) to illegal (marijuana to all other) drugs which they coined “the gateway theory.” Recent twin and longitudinal studies have provided support for this hypothesis (Lessem et al., 2006; Lynskey, Vink, & Boomsma, 2006). Excluding ketamine (which had minimally reported use), the results of this study imply a similar temporal relationship, with alcohol being the first substance used, followed by marijuana, then club drugs. Future research should continue to examine whether marijuana use actually facilitates the use of club drugs as a “gateway” drug (Yamaguchi & Kandel, 1984a) or because marijuana has a desired potentiating or “coming down” effect (Boeri et al., 2008). One alternative consideration would be to examine if the observed relationship between marijuana and club drug use is related to other factors not measured in this study, such as overconfidence due to lack of negative experiences from use (e.g., optimistic bias) peer pressure (e.g., examination of social networks), or higher levels of accessibility (e.g., convenience).

Surprisingly, neither smoking, drinking, nor polysubstance use were significantly associated with club drug use in the behavioral model, though smoking and polysubstance use were independently related to club drug use. With regard to smoking, previous research has found the concomitant use of tobacco and club drugs (Barrett et al., 2005) but has failed to find smoking as a significant predictor for initiation (Vervaeke, Benschop, van den Brink, & Korf, 2008). However, levels of smoking tend to

increase when using other substances (Barrett et al., 2006). For this study, the lack of relationship between smoking and club drug use in the behavioral model could be due to shared variance among other variables in the model (e.g., marijuana, polysubstance). Also, inclusion of any tobacco use in one's lifetime may have resulted in too broad of a range of smokers reducing potential differences in club drug use based on smoking status. Parceling smoking status into categories (e.g., never smoker, former smoker, daily smoker) or only assessing smoking dose in current smokers may be a more sensitive assessment of the relationship between smoking and club drug use. Alternatively, since college student and Hispanic smokers generally, and UTEP smokers specifically, smoke at relatively low levels (Ling & Glantz, 2004; Rodriguez Esquivel et al., 2007; Wortley, Huste, Troclair, Chrismon, & Pederdon, 2003), common relationships between smoking and drug use may be less often observed (e.g., smoking initiation at later age; addiction not as prevalent) (Hanson et al., 2008; Okuyemi et al., 2002).

Similar to smoking, polysubstance use was related to club drug use independently but not in the overall model, again suggesting a less salient relationship than observed in the literature (Barrett et al., 2006; Simons et al., 2005; Verheyden, Henry, et al., 2003; Yamaguchi & Kandel, 1984b). Potentially the gross measure of polysubstance use in this study yielded this limited relationship such that a more nuanced approach to commonly used drugs simultaneously may have resulted in a more strongly observed relationship. Additionally, limitations within (e.g., lifetime use; light smoking sample) and strong underlying associations between each of the substance use variables in the behavioral model may have contributed to the observed weaker relationship.

Alcohol use was unrelated to club drug use either independently or among potential behavioral correlates. Similar to smoking, drinking has been found to precede and co-occur with club drugs (Barrett et al., 2006), as well as be associated with increases in initiation (Barrett et al., 2006) and continued use of club drugs (Ford & Arrastia, 2008). Limited variability in lifetime use of alcohol in this sample may explain an inability to differentiate between club drug users and non users. This suggests that using a

more sensitive measure of alcohol use (e.g., number of drinking days in the past month, binge drinking) would increase the likelihood of finding the more typical association with club drug use. This possibility was explored (i.e., number of drinking days in the past month, past month alcohol use), and alcohol and club drug use still were not significantly related. However, given the high rates of drinking in this sample and a clear relationship between alcohol and club drug use in the literature (Ford & Arrastia, 2008, Smit et al., 2002), continued assessment of this relationship is warranted in future studies in this population.

The pattern of licit and illicit substance use on the border may be unique such that cultural variables other than acculturation may be more implicated than in other ethnocultural groups. For example, the use of these substances may be more reflective of cultural/societal norms (e.g., family gatherings, rite of passage, experimentation) than risk factors for club drug use. Perhaps a theoretical model that takes into account intentions, beliefs, and social norms such as the Theory of Reasoned Action (Fishbein & Ajzen, 1975) may provide a deeper understanding of club drug use and risk and protective factors in this population. In sum, it seems that the pattern of drug use in this sample indicates that future studies and programs should attend more to the measurement of smoking, polysubstance use, and particularly marijuana use in addition to their associations with club drug use in order to promote improved prevention and interventions.

Consistent with hypotheses and previous research, higher levels of sensation seeking were associated with club drug use (Arducci et al., 1989; Martins et al., 2008a). This suggests that possibly the use of club drugs fulfills a need to seek out novel experiences. These results further the support for the use of applying cognitive behavioral theories to understanding club drug use in this sample. Consistent with this, previous literature has found sensation seeking to predict future drug use, in general, as well as increased frequency of club drugs over time (Pedersen, 1991; Simons et al., 2005). Sensation seeking has also been found to moderate the relationship with positive attitudes toward

ecstasy consumption and ecstasy use (Puente, Gonzalez Gutierrez, Abellan, & Lopez, 2008). Thus, individuals who are sensation seeking and see club drug use as an acceptable behavior are more likely to use club drugs.

Perhaps the most support for cognitive behavioral principles came from the relationship between sensation seeking and higher need for cognition on resultant club drug use, such that higher sensation seeking and higher need for cognition place a person at greater risk for club drug use. This may reflect a different type of sensation seeking drug user who potentially uses club drugs to seek out activating experiences from both behavioral and cognitive perspectives. These results reflect the importance of continued assessment of one's behaviors and cognitions in order to gain a better understanding of club drug use. To effectively change a person's behavior, it is important that the cognitions related to the behavior are identified (Ledley et al., 2005). Continued research should be conducted on the relationship between attitudes, sensation seeking, and need for cognition and the various types of club drugs. Prevention and intervention programs for club drug use should include components that target high sensation seeking students, such as through mass media campaigns that actively target sensation-seeking individuals (e.g., SENTAR; Stephenson, 2003).

#### **4.5 COGNITIVE CORRELATES**

Inconsistent with hypotheses, need for cognition was not a significant predictor in the univariate or cognitive model of club drug use. Initially, hypotheses were predicated on a limited number of studies assessing need for cognition and addictive behaviors and indicating a typically inverse relationship between need for cognition and use. For example, one recent study indicates that low need for cognition was associated with greater alcohol expectancies and alcohol use (Hittner, 2004). One potential explanation for the lack of association between need for cognition and club drug use is that the sample is comprised of University students with likely higher levels of need for cognition than non college

attending young adults or community based participants more generally (Tsfati, & Cappella, 2005). The complex findings here suggesting no independent or cognitive model based relationship to club drug use, yet one in tandem with high sensation seeking suggests future studies continue to assess this potentially nuanced relationship.

Consistent with hypotheses and previous studies, deficits in prospective memory were associated with club drug use (Heffernan, Jarvis, et al., 2001; Heffernan, Ling, et al., 2001). These results are alarming, particularly given the low levels of club drug use, as well as relatively lower mean of deficits in prospective memory observed in this study. Because of the cross sectional nature of this study, the temporal relationship between drug use and memory deficits cannot be determined. However, from an intuitive and empirically based perspective (Heffernan, Ling, et al., 2001; Morgan, Monaghan, & Curran, 2004), it is more likely that club drug use preceded memory deficit, suggesting that cognitive consequences of drug use may occur relatively rapidly. Alternatively, these results may suggest an impairment in which an individual has deficits in the ability to plan out and avoid circumstances in which club drug use is occurring. Clearly, future studies are warranted within this population to better understand this relationship. To gain a clear comprehension of the impact of club drug use on memory, future research should also consider assessing this relationship with more sophisticated and more psychometrically grounded measures of working memory (e.g., WAIS-III; Wechsler, 1997) and learning and memory (e.g., California Verbal Learning Test II; Delis, Kramer, Kaplan, & Ober, 2000). Prevention programs should include psychoeducation components on the likelihood of experiencing memory deficits due to drug use, while intervention programs may need to include skills training components found in many CBT programs that assist students with their memory deficits.

#### 4.6 COGNITIVE BEHAVIORAL THEORY

Taken together, the results from the behavioral and cognitive models, particularly that both significantly benefited model fit above demographic variables, support the continued use of cognitive behavioral theory in understanding club drug use. From a behavioral standpoint, the rates of smoking, drinking, marijuana, and club drug use found in this study suggest that club drug use is possibly associated with positive reinforcement, such that individuals have tried various drugs because use has resulted in enjoyable or satisfying results (Ledley et al., 2005). Lack of negative outcomes due to smoking, drinking, and marijuana use (Barrington, 2006; Carroll, 1998; McMullin & Giles, 1981) may have influenced a progression to club drug use. Additionally, as one seeks and receives reinforcement from new and varied experiences (i.e., sensation seeker), it may be expected that their patterns of drug use would move from legal to illegal.

From a cognitive perspective, the relationship between prospective memory and club drug use is of importance (Hackney & Cormier, 2001). Prospective memory is thought to be associated with memory task, target cue, ongoing task, and the individual (for a review, see McDaniel & Einstein, 2000) such that prospective memory deficits may result in planning and decision making impairment. Therefore, although the most likely directionality is that club drug use precedes prospective memory deficits, the relationship is likely cyclical such that the current finding has implications for both prevention (e.g., reduce potential memory based consequences) and treatment (e.g., ameliorate impaired decision making to purposefully plan and decide to use drugs). Solid support for cognitive behavioral based theories also comes from the interplay between sensation seeking (i.e., behavioral component) and need for cognition (i.e., cognitive component) suggesting that individuals who enjoy risky and stimulating experiences and are seeking a way to obtain higher cognitive challenges may see club drug use as a viable method to enhance both needs.

Whereas this study did not find support for the acculturation stress hypothesis or SMH, this study found cognitive behaviorally based theories to be useful in understanding club drug use in this population. In addition to cognitive behavioral theories, the findings may suggest the exploration of other constructs and theoretical approaches commonly employed in addictive behaviors research. For example, models that tap constructs such as social norms; social networking; patterns of licit and illicit drug use; and drug related attitudes, beliefs, and expectancies may serve to augment the theoretical and empirical understanding of club drug use, as well as assist in the refinement of evolving prevention and treatment programs.

#### **4.7 STRENGTHS**

There are numerous noteworthy strengths of this study. First this study adds to the literature by exploring a novel topic in an ethnocultural minority population for which there is a dearth of previous literature. Further, this is among the first studies assessing club drug use in Hispanic populations to include potential cognitive correlates, further advancing the likelihood of well-developed cognitive behavioral based prevention and treatments for this population. Not only does this study provide valuable information for future prevention and treatment development, it does so in a manner that will assist in program refinement and development from a culturally relevant perspective. Perhaps the greatest strength of this study is that the correlates potentially related to club drug use were examined in the context of multiple theories. The type of population assessed in this study provided a logical opportunity to evaluate the appropriateness of the Acculturation Stress Theory in understanding club drug use among Hispanic college students. Given that previous literature has found a relationship between affective correlates and club drug use, this relationship was assessed in the context of its applicability to SMH. Lastly, the potential impact of behavioral and cognitive correlates on club drug use was examined in the context of cognitive behavioral theories. Despite support found in other

populations for the Acculturation stress theory and SMH, this study suggests that within this population, Hispanic college students on the U.S/Mexico border, cognitive behavioral theory garnered more support.

#### **4.8 LIMITATIONS**

There are limitations to this study as well. First, the cross sectional design of this study limits the ability to infer the causality of these variables. Although significant relationships were found, longitudinal studies will be able to clarify the temporal relationship between these variable. Second, given the use of a border region sample of Hispanic students, the results' generalizability may be limited. Third, the data were based on self-reports and may have been answered inaccurately (e.g., memory) or dishonestly, given that club drug use is an illegal activity. However, evidence suggests that self-reports regarding club drugs are valid and reliable (Magura, Goldsmith, Casriel, Goldstein, & Lipton, 1987; Weatherby et al., 1994). Lastly, this study was unable to verify the use of club drugs through biochemical testing (e.g., saliva, blood, urine).

#### **4.9 FUTURE DIRECTIONS**

Based on these findings, more research is warranted. First, continued assessment of more nuanced cultural variables other than acculturation (e.g., machismo, familism) seems appropriate given higher male prevalence of club drug use and unique licit and illicit substance use patterns. Second, future studies may wish to include other potential affective, behavioral, and cognitive constructs, as interpretation of the current findings may suggest other potentially influential variables (e.g., drug beliefs, social norms). Third, given the lack of support for the acculturation stress theory and the SMH, future studies may choose to explore whether other theories, perhaps more psychosocial in nature (e.g., Social Networking Theory, Theory of Reasoned Action), further the understanding of club drug use in this population. Fourth, continued assessment of club drug use in other populations (e.g., high school students, students at Mexican universities, community based samples) will provide researchers with a



more representative view of club drug use among border region Hispanics. Finally, a prospective study of Hispanic college students' club drug use and its predictors and consequences is warranted to assess temporal relationships between the constructs of interest. Such information will be critical in the development of efficacious club drug use prevention and intervention programs for this population.

#### **4.10 IMPLICATIONS FOR PREVENTION AND INTERVENTION PROGRAMS**

In developing cognitive and behavioral prevention and intervention programs, it is important to include those variables relevant to the problem behavior. Since an estimated 1/5 of participants reported using club drugs, continued research and development of prevention and intervention programs are warranted. Patterns of club drug use suggest strong focus on ecstasy and psilocybin mushrooms, with some yet less attention given to other club drugs (e.g., ketamine). Demographic findings suggest that prevention programs should be developed and implemented for junior high school aged students, while intervention programs should be developed and implemented for more advanced high school and college aged students. Given the higher rates of club drug use in males, these programs should ensure message and treatment delivery that are relatable to men, while avoiding the alienation of females. For example, prevention messages could use sex neutral themes, yet attempt to engage males at an instinctual level (e.g., tone, male actors), while intervention programs could use video game strategies and role playing scenarios could engage a subtly greater number of male participants. Findings from potential affective correlates suggest that less depression may warrant inclusion in prevention and treatment programs such that mood monitoring or recognition of emotional expression may be triggers for club drug use. Findings from the potential behavioral correlates (especially independently related to club drug use), as well as a wealth of literature suggesting the comorbidity of marijuana and/or polysubstance use and club drugs indicates the need to educate students on the possibility of increasingly dangerous substance use patterns and consequences of substance use. Intervention programs should include techniques such as cognitive

restructuring to increase negative attitudes and beliefs of club drugs, cost and benefit analytic strategies to weigh drug use decisions, and coping strategies to assist in managing or avoiding these drug use triggers. The relationship between club drug use and sensation seeking (as well as the combined relationship with high need for cognition), suggest both prevention and intervention programs include components associated with seeking higher levels of stimulation (both behaviorally and cognitively). For example, intervention programs may consider use of motivational enhancement (Aharonovich, Brooks, Nunes, & Hasin, 2008; Rollnick & Miller, 1995) to assist students in identifying healthier alternatives to gaining life experiences (e.g., sky-diving, mountain hiking). Findings from potential cognitive correlates indicate that prevention campaigns should include education components on the immediate and long term impact club drug use may have on memory in the hopes of encouraging the formation of negative attitudes resulting in decreased use; while treatment programs may need to assist students in developing new skills or techniques for compensating for memory deficits (e.g., leaving notes, creating lists, labeling items).

#### **4.11 CONCLUSION**

A nontrivial level of club drug use was observed in this study, suggesting the need for continued assessment with Hispanic college students, as well as the development, implementation, and refinement of prevention and intervention programs. Researchers, clinicians, and healthcare providers should attend meaningfully to club drug use and associations with increasing age, male gender, lower levels of depression, marijuana use, increased levels of sensation seeking independently and in conjunction with higher levels of need for cognition, and deficits in prospective memory to reduce club drug use prevalence rates.

## References

- Abraham, H. D., Aldridge, A. M., & Gogia, P. (1996). The psychopharmacology of hallucinations. *Neuropsychopharmacology, 14*, 285-298.
- Abraham, H. D., & Fava, M. (1999). Order of onset of substance abuse and depression in a sample of depressed outpatients. *Comprehensive Psychiatry, 40*, 44-50.
- Aharonovich, E., Brooks, A. C., Nunes, E. V., & Hasin, D. S. (2008). Cognitive deficits in marijuana users. Effects on motivational enhancement therapy plus cognitive behavioral therapy treatment outcomes. *Drug and Alcohol Dependence, 95*, 279-283.
- Aharonovich, E., Nguyen, H. T., & Nunes, E. V. (2001). Anger and depressive states among treatment-seeking drug abusers: testing the psychopharmacological specificity hypothesis. *The American Journal on Addictions, 10*, 327-334.
- Amaro, H., Whitaker, R., Coffman, G., & Heeren, T. (1990). IX. Acculturation and marijuana and cocaine use: Findings from HHANES 1982-1984. *American Journal of Public Health, 80*, 54-60.
- American Psychiatric Association. (2000). *Diagnostic and Statistical Manual of Mental Disorder, Fourth Edition, Text Revision*. Washington, DC: American Psychiatric Association.
- Antony, M. M., Bieling, P. J., Cox, B. J., Enns, M. W., & Swinson, R. P. (1998). Psychometric properties of the 42-item and 21-item versions of the Depression Anxiety Stress Scales in clinical groups and a community sample. *Psychological Assessment, 10*, 176-181.
- Arciniega, L. T., Arroyo, R. A., Miller, W. R., & Tonigan, I. S. (1996). Alcohol, drug use and consequences among Hispanics seeking treatment for alcohol-related problems. *Journal of Studies on Alcohol, 57*, 613-618.
- Arducci, G. L., Archer, R. P., Pancoast, D. L., & Gordon, R. A. (1989). The relationship of MMPI and sensation seeking scales to adolescent drug use. *Journal of Personality Assessment, 53*, 253-266.

- Bagby, R. M., Parker, J. D. A., & Taylor, G. J. (1994). The twenty-item Toronto Alexithymia Scale-I. Item selection and cross-validation of the factor structure. *Journal of Psychosomatic Research*, 38, 23-32.
- Bagby, R. M., Taylor, G. J., & Parker, J. D. (1994). The twenty-item Toronto Alexithymia Scale-II. Convergent, discriminant, and concurrent validity. *Journal of Psychosomatic Research*, 38, 33-40.
- Bagozzi, R. P. (1993). An examination of the psychometric properties of measures of negative affect in the PANAS-X scales. *Journal of Personality and Social Psychology*, 65, 836-851.
- Baker, A., & Lee, N. K. (2003). A review of psychosocial interventions for amphetamine use. *Drug and Alcohol Review*, 22, 323-335.
- Banta-Green, C., Goldbaum, G., Kingston, S., Golden, M., Harruff, R., & Logan, B. K. (2005). Epidemiology of MDMA and associated club drugs in the Seattle area. *Substance Use & Misuse*, 40, 1295-1315.
- Baron, R. M., & Kenny, D. A. (1986). The moderator-mediator variable distinction in social psychological research: Conceptual, strategic, and statistical considerations. *Journal of Personality and Social Psychology*, 51, 1173-1182.
- Barrett, S. P., Darredeau, C., & Pihl, R. O. (2006). Patterns of simultaneous polysubstance use in drug using university students. *Human Psychopharmacology*, 21, 255-263.
- Barrett, S. P., Gross, S. R., Garand, I., & Pihl, R. O. (2005). Patterns of simultaneous polysubstance use in Canadian rave attendees. *Substance Use & Misuse*, 40, 1525-1537.
- Barrington, J. (2006). Cognitive behaviour therapy: Standards for training and clinical practice. *Behaviour Change*, 23, 227-238.
- Beck, A. T. (1964). Thinking and depression: 2. Theory and therapy. *Archives of General Psychiatry*, 10, 561-571.

- Beck, A. T., Emery, G., & Greenberg, R. (1985). *Anxiety Disorders and Phobias: A Cognitive Perspective*. New York: Basic Books.
- Beck, A. T., & Freeman, A. (1990). *Cognitive Therapy of Personality Disorders*. New York: Guildford Press.
- Beck, A. T., Freeman, A., & Davis, D. (2004). *Cognitive Therapy of Personality Disorders*, Second Edition. New York: Guildford Press.
- Berry, J. W. (1980). Acculturation as varieties of adaptation. In A. M. Padilla (Eds.) *Acculturation: Theory, Models and Some New Findings*. Boulder, CO: Westview Press.
- Berry, J. W., Kim, U., Minde, T., & Mok, D. (1987). Comparative models of acculturative stress. *International Migration Review*, 21, 491-511.
- Berthoz, S., Ouhayoun, B., Perez-Daiz, F., Consoli, S. M., & Jouvent, R. (2000). Comparison of the psychometric properties of two self-report questionnaires measuring alexithymia: Confirmatory factor analysis of the 20-item Toronto Alexithymia Scale and the Bermond-Vorst Alexithymia Questionnaire. *European Review of Applied Psychology*, 50, 359-368.
- Blume, A. W., Schmalings, K. B., & Marlatt, G. A. (2000). Revisiting the self-medication hypothesis from a behavioral perspective. *Cognitive and Behavioral Practice*, 7, 379-384.
- Boeri, M. W., Sterk, C. E., Bahora, M., & Elifson, K. W. (2008). Poly-drug use among ecstasy users: Separate, synergistic, and indiscriminate patterns. *Journal of Drug Issues*, 38, 517-542.
- Brecht, M. L., von Mayhauser, C., & Anglin, M. D. (2000). Predictors of relapse after treatment for methamphetamine use. *Journal of Psychoactive Drugs*, 32, 211-220.
- Brown, T. A., Chorpita, B. F., Korotitsch, W., & Barlow, D. H. (1997). Psychometric properties of the Depression Anxiety Stress Scales (DASS) in clinical samples. *Behaviour Research and Therapy*, 35, 79-89.

- Butler, A. C., Chapman, J. E., Forman, E. M., & Beck, A. T. (2006). The empirical status of cognitive-behavioral therapy: A review of a meta-analysis. *Clinical Psychology Review, 26*, 17-31.
- Bux, D. A., & Irwin, T. W. (2006). Combining motivational interviewing and cognitive-behavioral skills training for the treatment of crystal methamphetamine abuse/dependence. *Journal of Gay and Lesbian Psychotherapy, 10*, 143-152.
- Cacioppo, J. T., & Petty, R. E. (1982). The Need for Cognition. *Journal of Personality and Social Psychology, 42*, 116-131.
- Cacioppo, J. T., Petty, R. E., Feinstein, J. A., & Jarvis, B. G. (1996). Dispositional differences in cognitive motivation: The life and times of individuals varying in need for cognition. *Psychological Bulletin, 119*, 197-253.
- Cacioppo, J. T., Petty, R. E., & Kao, C. F. (1984). The efficient assessment of need for cognition. *Journal of Personality Assessment, 48*, 306-307.
- Carroll, K. M. (1998). *A Cognitive-Behavioral Approach: Treating Cocaine Addiction*. NIH Publication 98-4308. Rockville, MD: National Institute on Drug Abuse.
- Cecero, J. J., & Holmstrom, R. W. (1997). Alexithymia and affect pathology among adult male alcoholics. *Journal of Clinical Psychology, 53*, 201-208.
- Christie, K. A., Burke, J. D., Regier, D. A., Rae, D. S., Boyd, J. H., & Locke, B. Z. (1988). Epidemiological evidence for early onset of mental disorders and higher risk of drug abuse in young adults. *American Journal of Psychiatry, 145*, 971-975.
- Chutuape, M. A. D., & de Wit, H. (1995). Preferences for ethanol and diazepam in anxious individuals: An evaluation of the self-medication hypothesis. *Psychopharmacology, 121*, 91-103.
- Cleland, C., Magura, S., Foote, J., Rosenblum, A., & Kosanke, N. (2005). Psychometric properties of the Toronto Alexithymia Scale (TAS-20) for substance users. *Journal of Psychosomatic Research, 58*, 299-306.

- Coffin, P. O., Galea, S., Ahern, J., Leon, A. C., Vlahov, D., & Tardiff, K. (2003). Opiates, cocaine, and alcohol combinations in accidental drug overdose deaths in New York City, 1990-1998. *Addictions, 98*, 739-747.
- Cohen, J., Cohen, P., West, S. G., & Aiken, L. S. (2003). *Applied Multiple Regression/Correlation Analysis for the Behavioral Sciences*. Mahwah, N.J.: Lawrence Erlbaum Associates, Publishers.
- Compton, W. W., Thomas, Y. F., Conway, K. P., & Colliver, J. D. (2005). Developments in the epidemiology of drug use and drug use disorders. *American Journal of Psychiatry, 162*, 1494-1502.
- Cooper, M. L., Frone, M. R., Russell, M., & Mudar, P. (1995). Drinking to regulate positive and negative emotions: A motivational model of alcohol use. *Journal of Personality and Social Psychology, 69*, 990-1005.
- Cottler, L. B., Womack, S. B., Compton, W. M., & Ben-Abdallah, A. (2001). Ecstasy abuse and dependence among adolescents and young adults: Applicability and reliability of DSM-IV criteria. *Human Psychopharmacology, 16*, 599-606.
- Cox, W. M., Blount, J. P., & Rozak, A. M. (1998). Alexithymia and induced moods in alcohol-dependent males. *Personality and Individual Differences, 24*, 81-88.
- Crawford, J. R., & Henry, J. D. (2003). The Depression Anxiety Stress Scales (DASS): Normative data and latent structure in a large non-clinical sample. *British Journal of Clinical Psychology, 42*, 111-131.
- Crome, I. B. (2006). Overview: Beyond guidelines and guidance-psychosocial perspectives on treatment interventions for young people with substance problems in the United Kingdom. *Drugs: Education, Prevention, and Policy, 3*, 203-224.

- Cuellar, I., Arnold, B., & Maldonado, R. (1995). Acculturation ratings scale for Mexican Americans-II: A revision of the original ARSMA scale. *Hispanic Journal of Behavioral Sciences, 17*, 275-304.
- Culhane, S. E., Morera, O. F., & Hosch, H. M. (2004). The factor structure of the Need for Cognition Short Form in a Hispanic sample. *The Journal of Psychology, 138*, 77-88.
- Culhane, S. E., Morera, O. F., & Watson, P. J. (2006). The assessment of factorial invariance in Need for Cognition using Hispanic and Anglo samples. *The Journal of Psychology, 140*, 53-67.
- Curran, H. V., & Morgan, C. (2000). Cognitive, dissociative, and psychotogenic effects of ketamine in recreational users on the night of drug use and 3 days later. *Addiction, 95*, 575-590.
- Damphousse, K., & Kaplan, H. B. (1998). Interviewing processes between adolescent drug use and psychological distress: An examination of the self-medication hypothesis. *Social Behavior and Personality, 26*, 115-130.
- de la Rosa, M. R., Holleran, L. K., Rugh, D., & MacMaster, S. A. (2005). Substance abuse among U.S. Latinos: A review of the literature. *Journal of Social Work Practice in the Addictions, 5*, 1-20.
- de Timary, P., Luts, A., Hers, D., & Luminet, O. (2008). Absolute and relative stability of alexithymia in alcoholic inpatients undergoing alcohol withdrawal: Relationship to depression and anxiety. *Psychiatry Research, 157*, 105-113.
- de Win, M. M. L., Reneman, L., Reitsma, J. B., den Heeten, G. J., Booij, J., & van den Brink, W. (2004). Mood disorders and serotonin transporter density in ecstasy users-the influence of long-term abstinence, dose, and gender. *Psychopharmacology, 173*, 376-382.
- Delis, D. C., Kramer, J. H., Kaplan, E., & Ober, B. A. (2000). *California Verbal Learning Test-Second edition. Adult version. Manual*. San Antonio, TX: Psychological Corporation.
- Eisner, B. G., & Cohen, S. (1958). Psychotherapy with lysergic acid diethylamide. *Journal of Nervous and Mental Disease, 127*, 528-539.



- Ellis, A., & Harper, R. A. (1961). *A Guide to Rational Living*. Englewood Cliffs, N.J: Prentice-Hall.
- Ellis, A., Harper, R. A., & Powers, M. (1975). *A Guide to Rational Living*. Englewood Cliffs, N.J: Prentice-Hall.
- Epstein, J. A., Botvin, G. J., & Diaz, T. (2001). Linguistic acculturation associated with higher marijuana and polydrug use among Hispanic adolescents. *Substance Use & Misuse*, *36*, 477-499.
- Evren, C ., Dalbudak, E., & Cakmak, D. (2008). Alexithymia and personality in relation to dimensions of psychopathology in male alcohol-dependent inpatients. *Bulletin of Clinical Psychopharmacology*, *18*, 1-8.
- Faul, F., Erdfelder, E., Lang, A. G., & Buchner, A. (2007). G\*Power 3: A flexible statistical power analysis program for the social, behavioral, and biomedical sciences. *Behavior Research Methods*, *39*, 175-191.
- Fendrich, M., Wislar, J. S., Johnson, T. P., & Hubbell, A. (1998). A contextual profile of club drug use among adults in Chicago. *Addiction*, *98*, 1693-1703.
- Fiore, M. C., Bailey, W. C. Cohen S. J., Dorfman, S. F., Goldstein, M. G., Gritz, E. R., et al. (2000). *Clinical Practice Guideline: Treating Tobacco Use and Dependence*. Rockville, MD: U.S. Department of Health and Human Services. Public Health Service.
- Fishbein, M., & Ajzen, I. (1975). *Belief, Attitude, Intention, and Behavior: An Introduction to Theory and Research*. Reading, MA: Addison-Wesley.
- Ford, J. A., & Arrastia, M. C. (2008). Pill-poppers and dopers: A comparison of non-medical prescription drug use and illicit/street drug use among college students. *Addictive Behaviors*, *33*, 934-941.
- Fox, H. C., McLean, A., Turner, J. J. D., Parrott, A. C., Rogers, R., & Sahakian, B. J. (2002). Neuropsychological evidence of a relatively selective profile of temporal dysfunction in drug-free MDMA (“ecstasy”) polydrug users. *Psychopharmacology*, *162*, 203-214.

- Freeman, S. M., & Freeman, A. (2005). *Cognitive Behavior Therapy in Nursing Practice*. New York: Springer Publishing Company.
- Freese, T. E., Miotto, K., & Reback, C. J. (2002). The effects and consequences of selected club drugs. *Journal of Substance Abuse Treatment, 23*, 151-156.
- Gilbert, M. J., & Cervantes, R. C. (1986). Patterns and practices of alcohol use among Mexican Americans. *Hispanic Journal of Behavioral Sciences, 8*, 1-60.
- Goldsamt, L. A., O'Brien, J., Clatts, M. C., & McGuire, L. S. (2005). The relationship between club drug use and other drug use: A survey of New York City middle school students. *Substance Use & Misuse, 40*, 1539-1555.
- Gordon, M. M. (1964). *Assimilation in American Life*. New York: Oxford University Press.
- Gravetter, F. J. & Forzano, L.-A. B. (2006). *Research Methods for the Behavioral Sciences, 2<sup>nd</sup> edition*. Belmont, CA: Wadsworth Cengage Learning.
- Gray, J. M., & Wilson, M. A. (2007). A detailed analysis of the reliability and validity of the Sensation Seeking Scale in a UK sample. *Personality and Individual Differences, 42*, 641-651.
- Hackney, H. L., & Cormier, L.S. (2001). *The Professional Counselor: A Process Guide to Helping*. Needham Heights, MA: A Pearson Education Company.
- Hall, S. M., Munoz, R. F., & Reus, V. I. (1994). Cognitive-behavioral intervention increases abstinence rates for depressive-history smokers. *Journal of Consulting and Clinical Psychology, 62*, 141-146.
- Hall, D. H., & Queener, J. E. (2007). Self-medication hypothesis of substance use: Testing Khantzian's updated theory. *Journal of Psychoactive Drugs, 39*, 151-158.
- Hansell, S., & White, H. R. (1991). Adolescent drug use, psychological distress, and physical symptoms. *Journal of Health and Social Behavior, 32*, 288-301.

- Hannon, R., Adams, P., Harrington, S., Fries-Dias, C., & Gipson, M. T. (1995). Effects of brain injury and age on prospective memory self-rating and performance. *Rehabilitation Psychology, 40*, 289-298.
- Hanson, B. S., Murray, A. A., Blow, J., Naylor, N., Orozco, L., & Cooper, T. V. (2008, November). *Risk and protective factors related to Latino adolescent psychological problems*. Symposium conducted at the annual meeting of the Association of Behavioral and Cognitive Therapies, Orlando, FL.
- Harris, K., & Edlund, M. (2005). Self-medication of mental health problems: New evidence from a national survey. *Health Services Research, 40*, 117-134.
- Haviland, M. G., Hendryx, M. S., Shaw, D. G., & Henry, J. P. (1994). Alexithymia in women and men hospitalized for psychoactive substance dependence. *Comprehensive Psychiatry, 35*, 124-128.
- Heffernan, T. M., Jarvis, H., Rodgers, J., Scholey, A. B., & Ling, J. (2001). Prospective memory, everyday cognitive failure and central executive function in recreational users of ecstasy. *Human Psychopharmacology, 16*, 607-612.
- Heffernan, T. M., Ling, J., & Scholey, A. B. (2001). Subjective ratings of prospective memory deficits in MDMA ('ecstasy') users. *Human Psychopharmacology, 16*, 339-344.
- Helmers, K. F., & Mente, A. (1999). Alexithymia and health behaviors in healthy male volunteers. *Journal of Psychosomatic Research, 47*, 635-645.
- Hittner, J. B. (2004). Alcohol use among American college students in relation to need for cognition and expectations of alcohol's effects on cognition. *Current Psychology, 23*, 173-187.
- Hopfer, C., Mendelson, B., Van Leeuwen, J. M., Kelly, S. & Hooks, S. (2006). Club drug use among youths in treatment for substance abuse. *The American Journal on Addictions, 15*, 94-99.

- Jaccard, J., Wan, C. K., & Turrisi, R. (1990). The detection and interpretation of interaction effects between continuous variables in multiple regression. *Multivariate Behavioral Research, 25*, 467-478.
- Johnson, T. P., VanGeest, J. B., & Cho, Y. I. (2002). Migration and substance use: Evidence from the U.S. national health interview survey. *Substance Use & Misuse, 37*, 941-972.
- Johnston L. D., O'Malley P. M., Bachman J. G., & Schulenberg, J. E. (2005). *Monitoring the Future National Survey Results on Drug Use, 1975-2004: Volume II, College Students and Adults Ages 19-45* (NIH Publication No. 05-5728). Bethesda, MD: National Institute on Drug Abuse.
- Jones, E. E., & Pulos, S. M. (1993). Comparing process in psychodynamic and cognitive-behavioral therapies. *Journal of Consulting and Clinical Psychology, 61*, 306-316.
- Kandel, D. B., & Logan, J. A. (1984). Patterns of drug use from adolescence to young adulthood: Perceived risk for initiation, continued use, and discontinuation. *American Journal of Public Health, 74*, 660-666.
- Katerndahl, D., & Realini, J. (1999). Relationship between substance use and panic attacks. *Addictive Behaviors, 24*, 731-736.
- Kauhanen, J., Julkunen, J., Salonen, J. T. (1992). Coping with inner feelings and stress: Heavy alcohol use in the context of alexithymia. *Behavioral Medicine, 18*, 121-126.
- Keller, D. S., Carroll, K. M., Nich, C., & Rounsaville, B. J. (1995). Alexithymia in cocaine abusers. *The American Journal on Addictions, 4*, 234-244.
- Kessler, R. C., McGonagle, K. A., Zhao, S., Nelson, C. B., Hughes, M., Eshleman, S., et al. (1994). Lifetime and 12 month prevalence of DSM-III-R psychiatric disorders in the United States. Results from the National Comorbidity Survey. *Archives of General Psychiatry, 51*, 8-19.

- Keyes, K. M., Martins, S. S., & Hasin, D. S. (2008). Past 12-month and lifetime comorbidity and poly-drug use of ecstasy users among young adults in the United States: Results from the National Epidemiologic Survey on Alcohol and Related Conditions. *Drug and Alcohol Dependence, 97*, 139-149.
- Khantzian, E. J. (1985). The self-medication hypothesis of addictive disorders: Focus on heroin and cocaine dependence. *American Journal of Psychiatry, 142*, 1259-1264.
- Khantzian, E. J. (1997). The self-medication hypothesis of substance use disorders: A reconsideration and recent applications. *Harvard Review of Psychiatry, 4*, 231-244.
- Khantzian, E. J. (2003). The self-medication hypothesis revisited: The dually diagnosed patient. *Primary Psychiatry, 10*, 47-54.
- Kobus, K. (2003). Peers and adolescent smoking. *Addiction, 98*, 37-55.
- Krebs, C. P., & Steffey, D. M. (2005). Club drug use among delinquent youth. *Substance Use & Misuse, 40*, 1363-1379.
- Krystal, J. H., Karper, L. P., Seibyl, J. P., Freeman, G. K., Delaney, R., Bremner, J. D., et al. (1994). Subanesthetic effects of the noncompetitive NMDA antagonist, ketamine, in humans. *Archives of General Psychiatry, 51*, 199-214.
- Lankenau, S. E., & Clatts, M. C. (2005). Patterns of polydrug use among ketamine injectors in New York City. *Substance Use & Misuse, 40*, 1381-1397.
- Lechuga, J. (2008). Is acculturation a dynamic concept? The influence of method of priming culture on acculturation. *Hispanic Journal of Behavioral Sciences, 30*, 324-339.
- Ledley, D. R., Marx, B. P., Heimberg, R. G. (2005). *Making Cognitive-Behavioral Therapy Work: Clinical Process for New Practitioners*. New York: Guildford Press.
- Lepine, J-P., & Pelissolo, A. (1998). Social phobia and alcoholism: A complex relationship. *Journal of Affective Disorders, 50*, S23-S28.

- Lessem, J. M., Hopfer, C. J., Haberstick, B. C., Timberlake, D., Ehringer, M. A., Smolen, A. et al. (2006). Relationship between adolescent marijuana use and young adult illicit drug use. *Behavior Genetic, 36*, 498-505.
- Levy, K. B., O'Grady, K. E., Wish, E. D., & Arria, A. M. (2005). An in-depth qualitative examination of the ecstasy experience: Results of a focus group with ecstasy-using college students. *Substance Use & Misuse, 40*, 1427-1441.
- Lieb, R., Schuetz, C. G., Pfister, H., von Sydow, K., & Wittchen, H. (2002). Mental disorders in ecstasy users: A prospective-longitudinal investigation. *Drug and Alcohol Dependence, 68*, 195-207.
- Ling, P. M., & Glantz, S. A. (2004). Tobacco industry research on smoking cessation: Recapturing young adults and other recent quitters. *Journal of General Internal Medicine, 19*, 419-426.
- Loas, G., Corcos, M., Stephan, P., Pellet, J., Bizouard, P., Venisse, J. L., et al. (2001). Factorial structure of the 20-item Toronto Alexithymia Scale: Confirmatory factorial analyses in nonclinical and clinical samples. *Journal of Psychosomatic Research, 50*, 255-261.
- Loas, G., Fremaux, D., Otmani, O., Lecercle, C., & Delahousse, J. (1997). Is alexithymia a negative factor for maintaining abstinence? A follow-up study. *Comprehensive Psychiatry, 38*, 296-299.
- Loas, G., Verrier, A., Flament, M. F., Perez-Diaz, F., Corcos, M., Halfon, O., et al. (2001). Factorial structure of the Sensation-Seeking Scale-Form V: Confirmatory factorial analyses in nonclinical and clinical samples. *Canadian Journal of Psychiatry, 46*, 850-854.
- Lopez, H. I., Hu, D. D., Rodriguez Esquivel, D., Salgado, F., & Cooper, T. V. (2006, November). *An assessment of club drug use and its correlates in Hispanic college students*. Poster session presented at the annual meeting of the Association of Behavioral and Cognitive Therapies, Chicago, Illinois.

- Lopez, H. I., Resor, M. R., & Cooper, T. V. (2005, November). *An Assessment of club drug use in Mexican American college students*. Poster session presented at the annual meeting of the Association of Behavioral and Cognitive Therapy, Washington, D.C.
- Lovibond, S. H., & Lovibond, P. F. (1993). *Manual for the Depression Anxiety Stress Scales (DASS)*. New South Wales, Australia: The Psychology Foundation.
- Lovibond, P. F., & Lovibond, S. H. (1995). The structure of negative emotional states: Comparison of the Depression Anxiety Stress Scales (DASS) with the Beck Depression and Anxiety Inventories. *Behavior Research and Therapy*, *33*, 335-343.
- Low, K. G., & Gendaszek, A. E. (2002). Illicit use of psychostimulants among college students: A preliminary study. *Psychology, Health, & Medicine*, *7*, 283-287.
- Loxton, N. J., Wan, V. L. -N., Ho, A., M. -C., Cheung, B. K.-L., Tam, N., Leung, F. Y. K., et al. (2008). Impulsivity in Hong Kong-Chinese club-drug users. *Drug and Alcohol Dependence*, *95*, 81-89.
- Lynskey, M. T., Vink, J. M., & Boomsma, D. I. (2006). Early onset cannabis use and progression to other drug use in a sample of Dutch twins. *Behavior Genetics*, *36*, 195-200.
- MacInnes, N., Handley, S. L., & Harding, G. F. A. (2001). Former chronic methylenedioxymethamphetamine (MDMA or ecstasy) users report mild depressive symptoms. *Journal of Psychopharmacology*, *15*, 181-186.
- Magura, S., Goldsmith, D., Casriel, C., Goldstein, P. J. (1987). The validity of methadone clients' self-reported drug use. *International Journal of Addictions*, *22*, 727-749.
- Marin, G., & Marin, B. V. (1991). *Research with Hispanic populations*. Thousand Oaks, CA: Sage Publications.

- Mark, T. R.M., Coffey, D., McKusick, H., Harwood, E., King, E., Bouchery, J. et al. (2005). *National Expenditures for Mental Health Services and Substance Abuse Treatment, 1991-2000*. Rockville, MD: Department of Health and Human Services, Substance Abuse and Mental Health Services Administration.
- Markides, K.S., Krause, N., Mendes de Leon, C.F. (1988). Acculturation and alcohol consumption among Mexican American: A three-generation Study. *American Journal of Public Health, 78*, 1178-1181.
- Markides, K. S., Ray, L. A., Stroup-Benham, C. A., & Trevino, F. (1990). Acculturation and alcohol consumption in the Mexican American population of the Southwestern United States: Findings from HHANES 1982-1984. *American Journal of Public Health, 80*, 42-46.
- Markou, A., Kosten, T. R., & Koob, G. F. (1998). Neurobiological similarities in depression and drug dependence: A self-medication hypothesis. *Neuropsychopharmacology, 18*, 135-174.
- Marlatt, G. A., & Donovan, D. M. (2005). *Relapse Prevention: Maintenance Strategies in the Treatment of Addictive Behaviors, Second Edition*. New York: Guildford Press.
- Marlatt, G. A., & Gordon, J. R. (1985). *Relapse Prevention: Maintenance Strategies in the Treatment of Addictive Behaviors*. New York: Guildford Press.
- Martins, S. S., Storr, C. L., Alexandre, P. K., & Chilcoat, H. D. (2008a). Adolescent ecstasy and other drug use in the National Survey of Parents and Youth: The role of sensation seeking, parental monitoring, and peer's drug use. *Addictive Behaviors, 33*, 913-933.
- Martins, S. S., Storr, C. L., Alexandre, P. K., & Chilcoat, H. D. (2008b). Do adolescent ecstasy users have different attitudes toward drugs when compared to marijuana users? *Drug and Alcohol Dependence, 94*, 63-72.



- Maude-Griffin, P. M., Hohenstein, J. M., Humfleet, G. L., Reilly, P. M., Tusel, D. J., & Hall, S. M. (1998). Superior efficacy of Cognitive-Behavioural Therapy for urban crack cocaine abusers: Main and matching effects. *Journal of Consulting and Clinical Psychology, 66*, 832-837.
- Maxwell, J. C., & Spence, R. T. (2005). Profiles of club drug users in treatment. *Substance Use & Misuse, 40*, 1409-1426.
- McCardle, K., Luebbers, S., Carter, J. D., Croft, R. J., & Stough, C. (2004). Chronic MDMA (ecstasy) use, cognition, and mood. *Psychopharmacology, 173*, 434-439.
- McCaughan, J. A., Carlson, R. G., Falck, R. S., & Siegal, H. A. (2005). From “candy kids” to “chemi-kids”: A typology of young adults who attend raves in the Midwestern United States. *Substance Use & Misuse, 40*, 1503-1523.
- McCreary, D. R., Newcomb, M. D., & Sadave, S. (1999). The male role, alcohol use, and alcohol problems. *Journal of Counseling Psychology, 46*, 109-124.
- McDaniel, M. A., & Einstein, G. O. (2000). Strategic and automatic processes in prospective memory retrieval: A multiprocess framework. *Applied Cognition Psychology, 14*, 127-144.
- McMillan, B., & Conner, M. (2002). Drug use and cognitions about drug use amongst students: Changes over the university career. *Journal of Youth and Adolescence, 31*, 221-229.
- McMullin, R. E., & Giles, T. R. (1981). *Cognitive-Behavior Therapy. A Restructuring Approach*. New York: Grune & Stratton.
- Medina-Mora, M. E., Cavioto, P., Villatoro, J., Fleiz, C., Galvan-Castillo, F., & Tapia-Conyer, R. (2003). Drug use among adolescents: Results from the National Survey on Addictions. *Salud Publica de Mexico, 45*, 6-26.
- Milani, R. M., Parrott, A. C., Turner, J. J. D., & Fox, H. C. (2004). Gender differences in self-reported anxiety, depression, and somatization among ecstasy/MDMA polydrug users, alcohol/tobacco users, and nondrug users. *Addictive Behaviors, 29*, 965-971.

- Miller, W. R., & Wilbourne, P. L. (2002). Mesa Grande: A methodological analysis of clinical trials of treatments for alcohol use disorders. *Addiction, 97*, 265-277.
- Miltenberger, R. G. (2007). *Behavior Modification: Principles and Procedures*, Fourth Edition. Belmont, CA: Wadsworth.
- Mojtabai, R., Olfson, M., & Mechanic, D. (2002). Perceived need and help-seeking in adults with mood, anxiety, or substance use disorders. *Archives of General Psychiatry, 59*, 77-84.
- Montgomery, C., & Fisk, J. E. (2007). Everyday deficits in ecstasy-polydrug users. *Journal of Psychopharmacology, 21*, 709-717.
- Morgan, C. J. A., Monaghan, L., & Curran, H. V. (2004). Beyond the K-hole: A 3-year longitudinal investigation of the cognitive and subjective effects of ketamine in recreational users who have substantially reduced their use of the drug. *Addiction, 99*, 1450-1461.
- Mueller, J. H., & Johnson, W. C. (1990). Trait distinctiveness and age specificity in self-referent information processing. *Psychonomic Society, 28*, 199-122.
- Murray, C. J., & Lopez, A. D. (1996). The global burden of disease. *A comprehensive assessment of mortality and disability from diseases, injuries, and risk factors in 1990 projected to 2020*. Boston: The Harvard School of Public Health.
- National Center for Educational Statistics (2005). *Digest of Education Statistics*. Washington, DC: Institute of Educational Science, United States Department of Justice.
- National Institute on Drug Abuse. (2002). *NIDA Community Drug Alert Bulletin-Club Drugs*. Available online at <http://www.drugabuse.gov/ClubAlert/Clubdrugalert.html>. [accessed October 2007].
- National Survey on Drug Use and Health (NSDUH). (2004). *Results from the 2003 National Survey on Drug Use and Health: National Findings*. Rockville, MD: SAMHSA, Available online at <http://www.oas.samhsa.gov/nhsda/2k3nsduh/2k3Results.htm>. [accessed January 2008].

- National Survey on Drug Use and Health (NSDUH). (2005). *Results from the 2004 National Survey on Drug Use and Health: National Findings*. Rockville, MD: SAMHSA.
- Neff, J.A. (2001). A confirmatory factor analysis of a measure of “Machismo” among Anglo, African American, and Mexican American Male drinkers. *Hispanic Journal of Behavioral Sciences*, 23, 171-188.
- Neff, J. A., & Hoppe, S. K. (1992). Acculturation and drinking patterns among U.S. Anglos, Blacks, and Mexican Americans. *Alcohol and Alcoholism*, 27, 293-308.
- Neff, J. A., Hoppe, S. K., & Perea, P. (1987). Acculturation and alcohol use: Drinking patterns and problems among Anglo and Mexican American male drinkers. *Hispanic Journal of Behavioral Sciences*, 9, 151-181.
- Novoa, R. A., Ompad, D. C., Wu, Y., Vlahov, D., & Galea, S. (2005). Ecstasy use and its association with sexual behaviors among drug users in New York City. *Journal of Community Health*, 30, 331-343.
- Okuyemi, K. S., Harris, K. J., Scheibmeir, M., Choi, W. S., Powell, J., & Ahluwalia, J. S. (2002). Light smokers: Issues and recommendations. *Nicotine & Tobacco Research*, 2, 103-112.
- Olson, K. R., Camp, C., & Fuller, D. (1984). Curiosity and need for cognition. *Psychological Reports*, 54, 71-74.
- Ompad, D. C., Galea, S., Fuller, C. M., Phelan, D., & Vlahov, D. (2004). Club drug use among minority substance users in New York City. *Journal of Psychoactive Drugs*, 36, 397-399.
- Parker, P. D., Prkachin, K. M., & Prkachin, G. C. (2005). Processing of facial expressions of negative emotion in alexithymia: The influence of temporal constraint. *Journal of Personality*, 73, 1087-1107.

- Parker, J. D. A., Taylor, G. J., & Bagby, R. M. (2003). The 20-item Toronto Alexithymia Scale III. Reliability and factorial validity in a community population. *Journal of Psychosomatic Research, 55*, 269-275.
- Parks, K. A., & Kennedy, C. L. (2004). Club drugs: Reasons for and consequences of use. *Journal of Psychoactive Drugs, 36*, 295-302.
- Parrott, A. C., Buchanan, T., Scholey, A. B., Heffernan, T., Ling, J., & Rodgers, J. (2002). Ecstasy/MDMA attributed problems reported by novice, moderate, and heavy recreational users. *Human Psychopharmacology, 17*, 309-312.
- Parrott, A. C., Milani, R. M., Parmar, R., & Turner, J. J. D. (2001). Recreational ecstasy/MDMA and other drugs users from the UK and Italy: Psychiatric symptoms and psychobiological problems. *Psychopharmacology, 159*, 77-82.
- Pedersen, W. (1991). Mental health, sensation seeking and drug use patterns: A longitudinal study. *British Journal of Addiction, 86*, 195-204.
- Pinard, L., Negrete, J. C., Annable, L., & Audet, N. (1996). Alexithymia in substance abusers. *The American Journal on Addictions, 5*, 32-39.
- Puente, C. P., Gonzalez Gutierrez, J. L. G., Abellan, I. B., & Lopez, A., L. (2008). Sensation seeking, attitudes towards drug use, and actual use among adolescents: Testing a model for alcohol and ecstasy use. *Substance Use & Misuse, 43*, 1615-1627.
- Rawson, R. A., Gonzales, R., & Brethen, P. (2002). Methamphetamine: Current research findings and clinical challenges. *Journal of Substance Abuse Treatment, 23*, 145-150.
- Roberti, J. W., Storch, E. A., & Bravata, E. (2003). Further psychometric support for the Sensation Seeking Scale-Form V. *Journal of Personality Assessment, 81*, 291-292.

- Rodgers, J., Buchanan, T., Pearson, C., Parrott, A. C., Ling, J., Heffernan, T. et al. (2006). Differential experiences of the psychobiological sequelae of ecstasy use: Quantitative and qualitative data from an internet study. *Journal of Psychopharmacology*, *20*, 437-446.
- Rodgers, J., Buchanan, T., Scholey, A. B., Heffernan, T. M., Ling, J. & Parrott, A. C. (2001). Differential effects of ecstasy and cannabis on self-reports of memory ability: A web-based study. *Human Psychopharmacology*, *16*, 619-625.
- Rodgers, J., Buchanan, T., Scholey, A. B., Heffernan, T. M., Ling, J., & Parrott, A. C. (2003). Patterns of drug use and the influence of gender on self-reports of memory ability in ecstasy users: A web-based study. *Journal of Psychopharmacology*, *17*, 389-396.
- Rodriguez Esquivel, D., Venegas, J., Taylor, T. J., Naylor, N. K., Kantin, A. V., & Cooper, T. V. (2007, November). *StopLite: A brief smoking cessation intervention for light smokers*. Poster session presented at the annual meeting of the Association of Behavioral and Cognitive Therapies, Philadelphia, Pennsylvania.
- Rohsenow, D. J., Monti, P. M., Martin, R. A., Michalec, E., & Abrams, D. B. (2000). Brief coping skills treatment for cocaine abuse: 12-month substance use outcomes. *Journal of Clinical and Consulting Psychology*, *68*, 515-520.
- Roiser, J. P., Cook, L. J., Cooper, J. D., Rubinsztein, D. C., & Sahakian, B. J. (2005). Association of a functional polymorphism in the serotonin transporter gene with abnormal emotional processing in ecstasy users. *American Journal of Psychiatry*, *162*, 609-612.
- Roiser, J. P., & Sahakian, B. J. (2004). Relationship between ecstasy use and depression: A study controlling for poly-drug use. *Psychopharmacology*, *173*, 411-417.
- Rollnick, S. & Miller, W. R. (1995). What is Motivational Interviewing? *Behavioral and Cognitive Psychotherapy*, *23*, 325-334.

- Rosenblum, A., Cleland, C., Magura, S., Mahmood, D., & Kosanke, N. (2005). Moderators of effects of motivational enhancement to cognitive behavioral therapy. *The American Journal of Drug and Alcohol Abuse, 1*, 35-58.
- Rothbart, M. K., & Ahadi, S. A. (1994). Temperament and the development of personality. *Journal of Abnormal Psychology, 103*, 55-66.
- Rybakowski, J., Ziolkowski, M., Zasadzka, T., & Brzezinski, R. (1988). High prevalence of alexithymia in male patients with alcohol dependence. *Drug and Alcohol Dependence, 21*, 133-136.
- Saarijarvi, S., Salminen, J. K., & Toikka, T. B. (2001). Alexithymia and depression: A 1-year follow-up study in outpatients with major depression. *Journal of Psychosomatic Research, 51*, 729-733.
- Sadowski, C. J., & Gulgoz, S. (1992). Internal consistency and test-retest of the Need for Cognition scale. *Perceptual and Motor Skills, 74*, 610.
- Schifano, F., Oyefeso, A., Cobain, C. K., Jambert-Gray, R., Martinotti, G., & Ghodse, A. H. (2003). Death rates from ecstasy (MDMA, MDA) and polydrug use in England and Wales 1996-2002. *Human Psychopharmacology, 18*, 519-524.
- Scholey, A.B., Parrott, A. C., Buchanan, T., Heffernan, T. M., Ling, J., & Rodgers, J. (2004). Increased intensity of ecstasy and polydrug usage in the more experienced recreational ecstasy/MDMA users: A WWW study. *Addictive Behaviors, 29*, 743-752.
- Sharma, A., Durand, R. M., & Gur-Arie, O. (1981). Identification and analysis of moderator variables. *Journal of Marketing Research, 18*, 291-300.
- Sifneos, P. E. (1973). The prevalence of alexithymic characteristics in psychosomatic patients. *Psychotherapy and Psychosomatics, 22*, 255-262.
- Simons, J. S., Gaher, R. M., Correia, C. J., & Bush, J. A. (2005). Club drug use among college students. *Addictive Behaviors, 30*, 1619-1624.

- Simons-Morton, B. (2007). Social influences on adolescent substance use. *American Journal of Health Behavior, 31*, 672-684.
- Smit, F., Monshouwer, K., & Verdurmen, J. (2002). Polydrug use among secondary school students: Combinations, prevalences and risk profiles. *Drugs: Education, Prevention, and Policy, 9*, 355-365.
- Soellner, K. (2005). Club drug use in Germany. *Substance Use & Misuse, 40*, 1279-1293.
- Speranza, M., Corcos, M., Stephan, P., Loas, G., Perez-Diaz, F., Lang, F., et al. (2004). Alexithymia, depressive experiences, and dependency in addictive disorders. *Substance Use & Misuse, 39*, 551-579.
- SPSS Inc. (2006). Command Syntax Reference [Computer software]. Chicago: IL: Authors.
- Stephenson, M. T. (2003). Mass media strategies targeting high sensation seekers: What works and why. *American Journal of Health Behavior, 27*, 233-238.
- Substance Abuse and Mental Health Services Administration (SAMHSA). (2005). *Results from the 2004 National Survey on Drug Use and Health: National Findings*. NSDUH Series H-28. U. S. Department of Health and Human Services (DHHS) Publication No. SMA 05-4062. Rockville, MD: SAMHSA, Office of Applied Studies.
- Substance Abuse and Mental Health Services Administration (SAMHSA). (2006). *Results from the 2005 National Survey on Drug Use and Health: National Findings*. NSDUH Series H-30. U. S. Department of Health and Human Services (DHHS) Publication No. SMA 06-4194. Rockville, MD: SAMHSA, Office of Applied Studies.
- Swendsen, J. D., Tennen, H., Carney, M. A., Affleck, G., Willard, A., & Hromi, A. (2000). Mood and alcohol consumption: An experience sampling test of the self-medication hypothesis. *Journal of Abnormal Psychology, 109*, 198-204.

- Taylor, G. J., Bagby, R. M., & Parker, J. D. A. (1997). *Disorders of Affect Regulation: Alexithymia in Medical and Psychiatric Illness*. New York: Cambridge University Press.
- Taylor, G. J., Bagby, R. M., & Parker, J. D. A. (2003). The 20-item Toronto Alexithymic Scale-IV: Reliability and factorial validity in different languages and cultures. *Journal of Psychosomatic Research, 55*, 277-283.
- Thomasius, R., Petersen, K. U., Zapletavola, P., Wartburg, L., Zeichner, D., & Schmoldt, A. (2005). Mental disorders in current and former heavy ecstasy (MDMA) users. *Addiction, 100*, 1310-1319.
- Thompson, J. P., Anglin, M. D., Emboden, W., & Fisher, D. G. (1985). Mushroom use by college students. *Journal of Drug Education, 15*, 111-124.
- Tomlinson, K. L., Tate, S. R., Anderson, K. G., McCarthy, D. M., & Brown, S. A. (2006). An examination of self-medication and rebound effects: Psychiatric symptomatology before and after alcohol and drug relapse. *Addictive Behaviors, 31*, 461-474.
- Troisi, A., Pasini, A., Saracco, M., & Spalletta, G. (1998). Psychiatric symptoms in male cannabis users not using other illicit drugs. *Addiction, 93*, 487-492.
- Tsfati, Y., & Cappella, J. N. (2005). Why do people watch news they do not trust? The need for cognition as a moderator in the association between news media skepticism and exposure. *Media Psychology, 7*, 251-271.
- Urbaniak, G. C., & Plous, S. (2008). Research randomizer form v4.0 [Random number generator]. Retrieved from <http://www.randomizer.org/form.htm>
- U.S. Census Bureau. (2006). *Nation's Population One-third Minority*. Available at: <http://www.census.gov/Press-Release/www/releases/archives/population/006808.html> [accessed October 2007].



- Vega, W. A., Gil, A. G., & Zimmerman, R. S. (1993). Patterns of drug use among Cuban-American, African American, and White Non-Hispanic boys. *American Journal of Public Health, 83*, 257-259.
- Verheyden, S. L., Henry, J. A., & Curran, H. V. (2003). Acute, sub-acute, and long term subjective consequences of 'ecstasy' (MDMA) consumption in 430 regular users. *Human Psychopharmacology, 18*, 507-517.
- Verheyden, S. L., Maidment, R., & Curran, H. V. (2003). Quitting ecstasy: An investigation of why people stop taking the drug and their subsequent mental health. *Journal of Psychopharmacology, 17*, 317-378.
- Vervaeke, H. K. E., Benschop, A., van den Brink, W., & Korff, D. J. (2008). Predicting ecstasy use among young people at risk: A prospective study of initially ecstasy-naïve subjects. *Journal of Drug Education, 38*, 131-146.
- Watson, D. (1988). The vicissitudes of mood measurement: Effects of varying descriptors, times frames, and response formats on measures of positive and negative affect. *Journal of Personality and Social Psychology, 55*, 128-141.
- Watson, D., & Clark, L. A. (1992). Affects separable and inseparable: On the hierarchical arrangement of the negative affects. *Journal of Personality and Social Psychology, 62*, 489-505.
- Watson, D., & Clark, L. A. (1994) *Manual for the Positive and Negative Affect Schedule (Expanded Form)*. Unpublished manuscript, University of Iowa.
- Watson, D., & Tellegen, A. (1985). Toward a consensual structure of mood. *Psychological Bulletin, 98*, 219-235.
- Weatherby, N., Needle, R., Cesari, H., Booth, R., McCoy, C., Watters, J. et al. (1994). Validity and self-reported drug use among injection drug users and crack cocaine users recruited through street outreach. *Evaluation and Program Planning, 17*, 347-355.

- Wechsler, D. (1997). *WAIS-III & WMS-III technical manual*. San Antonio: The Psychological Corporation.
- Weingartner, K., Robinson, J., Fogel, D., & Gruman, C. (2002). Depression and substance use in a middle aged and older Puerto Rican population. *Journal of Cross-Cultural Gerontology, 17*, 173-193.
- Weiss, R. D., Griffin, M. L., & Mirin, S. M. (1992). Drug abuse as self-medication for depression: An empirical study. *American Journal of Drug and Alcohol Abuse, 18*, 121-129.
- Wells, K., Klap, R., Koike, A., & Sherbourne, C. (2001). Ethnic disparities in unmet need for alcoholism, drug abuse, and mental health care. *American Journal of Psychiatry, 158*, 2027-2032.
- Wills, T. A., Sandy, J. M., Shinar, O., & Yaeger, A. (1999). Contributions of positive and negative affect to adolescent substance use: Test of a bidimensional model in a longitudinal study. *Psychology of Addictive Behaviors, 13*, 327-338.
- Wills, T. A., Windle, M., & Cleary, S. D. (1998). Temperament and novelty seeking in adolescent substance use: Convergence of dimensions of temperament with constructs from Cloninger's theory. *Journal of Personality and Social Psychology, 74*, 387-406.
- Wortley, P. M., Husten, C. G., Trosclair, A., Chrismon, J., & Pederson, L. L. (2003). Nondaily smokers: A descriptive analysis. *Nicotine & Tobacco Research, 5*, 755-759.
- Wu, L., Schlenger, W. E., & Galvin, D. M. (2006). Concurrent use of methamphetamine, MDMA, LSD, ketamine, GHB, and flunitrazepam among American youths. *Drug and Alcohol Dependence, 84*, 102-113.
- Yamaguchi, K., & Kandel, D. B. (1984a). Patterns of drug use from adolescent to young adulthood: II. Sequences of progression. *American Journal of Public Health, 74*, 668-672.

- Yamaguchi, K., & Kandel, D. B. (1984b). Patterns of drug use from adolescent to young adulthood: III. Predictors of progression. *American Journal of Public Health, 74*, 673-681.
- Zelman, D. C., Brandon, T. H., Jorenby, D. E., & Baker, T. B. (1992). Measures of affect and nicotine dependence predict differential response to smoking cessation treatments. *Journal of Consulting and Clinical Psychology, 60*, 943-952.
- Ziolkowski, M., Gruss, T., & Rybakowski, J. K. (1995). Does alexithymia in male alcoholics constitute a negative factor for maintaining abstinence? *Psychotherapy and Psychosomatics, 63*, 169-173.
- Zuckerman, M. (1994). *Behavioral Expressions and Biosocial Bases of Sensation Seeking*. New York: Cambridge University Press.
- Zuckerman, M., Eysenck, S. B., & Eysenck, H. J. (1978). Sensation seeking in England and America: Cross-cultural, age, and sex comparisons. *Journal of Consulting and Clinical Psychology, 46*, 139-149.
- Zuckerman, M., Neary, R. S., & Brustman, B. A. (1970). Sensation-seeking scale correlates in experience (smoking, drugs, alcohol, "hallucinations", and sex) and preference for complexity (designs). *Proceedings of the Annual Convention of the American Psychological Associations, 317-318*

Table 1: Hypothesis

| <i>Hypotheses</i>                  |   |
|------------------------------------|---|
| Variable                           | Predicted Relationship to Club Drug Use |
| Hypothesis 1: Acculturation-Stress |   |
| Acculturation                      | +                                       |
| Stress                             | +                                       |
| Hypothesis 2: Affective Correlates |   |
| Depression                         | +                                       |
| Anxiety                            | +                                       |
| Stress                             | +                                       |
| Positive Affect                    | -                                       |
| Negative Affect                    | +                                       |
| Alexithymia                        | +                                       |

Table 1: Hypothesis Continued

*Hypotheses Continued*

---

| Variable                            | Predicted Relationship<br>to Club Drug Use |
|-------------------------------------|--|
| Hypothesis 3: Behavioral Correlates |  |
| Polysubstance use                   | +  |
| Sensation Seeking                   | +  |
| Hypothesis 4: Cognitive Correlates  |  |
| Need for Cognition                  | -  |
| Prospective Memory                  | +  |

---

Table 2: Participant Characteristics

*Participant Characteristics*

| Variable             | <i>n</i> | %    | <i>M</i> | <i>SD</i> |
|----------------------|----------|------|----------|-----------|
| Age                  | 320      |      | 20.7     | 4.33      |
| Gender               |          |      |          |           |
| Males                | 111      | 34.6 |          |           |
| Females              | 210      | 65.4 |          |           |
| Ethnicity            |          |      |          |           |
| Mexican American     | 254      | 79.1 |          |           |
| Mexican National     | 26       | 8.1  |          |           |
| Other Hispanic group | 41       | 12.8 |          |           |
| Greek Membership     |          |      |          |           |
| Member               | 23       | 7.2  |          |           |
| Nonmember            | 298      | 92.8 |          |           |

Table 2: Participant Characteristics Continued

*Participant Characteristics (continued)*

---

| Lifetime Use for each Club Drug | <i>n</i> | %    | <i>M</i> (Age of first use) | <i>SD</i> (Age of first use) |
|---------------------------------|----------|------|-----------------------------|------------------------------|
| Club Drug Use                   | 60       | 18.8 |                             |                              |
| Club Drug Non-use               | 259      | 81.2 | <i>NA</i>                   |                              |
| Ecstasy Use                     | 37       | 11.5 |                             |                              |
| Ecstasy Non-use                 | 284      | 88.5 | 18.52                       | 3.43                         |
| GHB Use                         | 0        | 0    |                             |                              |
| GHB Non-use                     | 321      | 100  | <i>NA</i>                   |                              |
| Ketamine Use                    | 8        | 2.5  |                             |                              |
| Ketamine Non-use                | 312      | 97.5 | 15.71                       | 3.35                         |
| LSD Use                         | 12       | 3.8  |                             |                              |
| LSD Non-use                     | 307      | 96.2 | 17.79                       | 2.46                         |
| Methamphetamine Use             | 8        | 2.5  |                             |                              |
| Methamphetamine Non-use         | 311      | 97.5 | 18.88                       | 6.01                         |
| Psilocybin Mushrooms Use        | 25       | 7.8  |                             |                              |
| Psilocybin Mushrooms Non-use    | 295      | 92.2 | 17.88                       | 2.26                         |
| Cigarette Use                   | 203      | 63.2 |                             |                              |
| Cigarette Non-use               | 108      | 33.6 | <i>NA</i>                   |                              |
| Alcohol Use                     | 298      | 93.1 |                             |                              |
| Alcohol Non-use                 | 22       | 6.9  | 15.31                       | 2.76                         |
| Marijuana Use                   | 156      | 48.9 |                             |                              |
| Marijuana Non-use               | 163      | 51.1 | 16.38                       | 2.69                         |
| Polysubstance Use               | 223      | 69.5 |                             |                              |
| Polysubstance Non-use           | 98       | 30.5 | <i>NA</i>                   |                              |

---

Table 2: Participant Characteristics Continued

*Participant Characteristics (continued)*

| Scale Scores                       | Mean  | SD    |
|------------------------------------|-------|-------|
| ARSMA-II                           | .38   | 1.20  |
| DASS (Depression subscale)         | 7.14  | 8.07  |
| DASS (Anxiety subscale)            | 7.68  | 6.80  |
| DASS (Stress subscale)             | 11.85 | 8.57  |
| PANAS-X (Positive affect subscale) | 2.04  | .68   |
| PANAS-X (Negative affect subscale) | 3.46  | .77   |
| TAS-20                             | 46.05 | 10.88 |
| SSS-V                              | 20.08 | 6.01  |
| NFC-SF                             | 50.57 | 7.74  |
| PMQ                                | 2.75  | .92   |



Table 3: Summary of Demographic Model for Club Drug Use

*Summary of the Demographic Model for Club Drug Use*

| Variable | <i>B</i> | Odds Ratio | 95% Confidence Intervals |       | <i>p</i> |
|----------|----------|------------|--------------------------|-------|----------|
|          |          |            | Lower                    | Upper |          |
| LogAge   | 2.41     | 11.14      | 2.33                     | 53.24 | <.01     |
| Gender   | .77      | 2.16       | 1.20                     | 3.91  | .01      |
| ARSMA-II | .16      | 1.18       | .92                      | 1.52  | .20      |
| Constant | -9.16    | .000       |                          |       | .00      |

Note. *n* = 311 (58 club drug users, 253 non-club drug users). ns were reduced because of missing values on some independent variables. Cox & Snell  $R^2 = .06$ : model goodness of fit:  $X^2 = 17.88, p < .001$ .

Table 4: Summary of the Acculturation Stress Model for Club Drug Use

*Summary of the Acculturation Stress Model for Club Drug Use*

| Variable               | <i>B</i> | Odds Ratio | 95% Confidence Intervals |       | <i>p</i> |
|------------------------|----------|------------|--------------------------|-------|----------|
|                        |          |            | Lower                    | Upper |          |
| Step 1                 |          |            |                          |       |          |
| LogAge                 | 2.59     | 13.37      | 2.71                     | 66.01 | .001     |
| Gender                 | .80      | 2.23       | 1.20                     | 4.13  | .01      |
| ARSMA-II               | .24      | 1.27       | .97                      | 1.65  | .08      |
| Step 2                 |          |            |                          |       |          |
| LogAge                 | 2.61     | 13.54      | 2.74                     | 66.84 | .001     |
| Gender                 | .82      | 2.26       | 1.22                     | 4.20  | .01      |
| ARSMA-II               | .22      | 1.25       | .96                      | 1.63  | .10      |
| DASS (Stress subscale) | .01      | 1.01       | .98                      | 1.05  | .52      |
| Constant               | -9.97    | .000       |                          |       | .00      |

Note.  $n = 293$  (54 club drug users, 239 non-club drug users). ns were reduced because of missing values on some independent variables.  $X^2(3) = 20.26, p < .001$  for Step 1;  $\Delta X^2(1) = .40, p = .52$  for Step 2.

Table 5: Summary of the Affective Model for Club Drug Use

*Summary of the Affective Model for Club Drug Use*

| Variable                   | <i>B</i> | Odds Ratio | 95% Confidence Intervals |        | <i>p</i> |
|----------------------------|----------|------------|--------------------------|--------|----------|
|                            |          |            | Lower                    | Upper  |          |
| Step 1                     |          |            |                          |        |          |
| LogAge                     | 2.99     | 19.86      | 3.62                     | 109.13 | .001     |
| Gender                     | .64      | 1.89       | .99                      | 3.61   | .05      |
| ARSMA-II                   | .29      | 1.34       | 1.01                     | 1.77   | .04      |
| Step 2                     |          |            |                          |        |          |
| LogAge                     | 3.37     | 28.93      | 4.49                     | 186.31 | <.001    |
| Gender                     | .63      | 1.88       | .96                      | 3.71   | .07      |
| ARSMA-II                   | .33      | 1.39       | 1.04                     | 1.87   | .03      |
| DASS (Depression subscale) | -.07     | .93        | .86                      | 1.00   | .06      |
| DASS (Anxiety subscale)    | .04      | 1.04       | .95                      | 1.13   | .41      |
| DASS (Stress subscale)     | .04      | 1.04       | .97                      | 1.11   | .29      |
| PANAS-X (Positive Affect)  | -.02     | .98        | .51                      | 1.86   | .94      |
| PANAS-X (Negative Affect)  | .21      | 1.24       | .75                      | 2.05   | .41      |
| TAS-20                     | .02      | 1.02       | .98                      | 1.05   | .35      |
| Constant                   | -13.77   | .000       |                          |        | .00      |

Note.  $n = 265$  (51 club drug users, 214 non-club drug users). ns were reduced because of missing values on some independent variables.  $X^2(3) = 20.49, p < .001$  for Step 1;  $\Delta X^2(1) = 7.21, p = .30$  for Step 2.

Table 6: Summary of the Behavioral Model for Club Drug Use

*Summary of the Behavioral Model for Club Drug Use*

| Variable          | <i>B</i> | Odds Ratio | 95% Confidence Intervals |        | <i>P</i> |
|-------------------|----------|------------|--------------------------|--------|----------|
|                   |          |            | Lower                    | Upper  |          |
| <b>Step 1</b>     |          |            |                          |        |          |
| LogAge            | 2.76     | 15.85      | 2.64                     | 95.11  | <.01     |
| Gender            | .76      | 2.14       | 1.14                     | 4.01   | <.05     |
| ARSMA-II          | .26      | 1.28       | .97                      | 1.68   | .08      |
| <b>Step 2</b>     |          |            |                          |        |          |
| LogAge            | 3.37     | 29.17      | 3.49                     | 243.60 | <.01     |
| Gender            | .37      | 1.45       | .72                      | 2.94   | .30      |
| ARSMA-II          | .13      | 1.13       | .84                      | 1.54   | .42      |
| Smoking           | 1.4      | 4.05       | .79                      | 20.84  | .10      |
| Drinking          | -.53     | .59        | .06                      | 6.01   | .66      |
| Marijuana Use     | 1.38     | 3.99       | 1.34                     | 11.87  | .01      |
| Polysubstance Use | -1.77    | .17        | .02                      | 1.55   | .12      |
| SSS-V             | .12      | 1.13       | 1.05                     | 1.22   | .001     |
| Constant          | -.14.47  | 000        |                          |        | .00      |

Note.  $n = 274$  (53 club drug users, 221 non-club drug users). ns were reduced because of missing values on some independent variables.  $X^2(3) = 19.49, p < .001$  for Step 1;  $\Delta X^2(1) = 34.51, p < .001$  for Step 2.

Table 7: Summary of the Cognitive Model for Club Drug Use

*Summary of the Cognitive Model for Club Drug Use*

| Variable | <i>B</i> | Odds Ratio | 95% Confidence Intervals |        | <i>P</i> |
|----------|----------|------------|--------------------------|--------|----------|
|          |          |            | Lower                    | Upper  |          |
| Step 1   |          |            |                          |        |          |
| LogAge   | 2.80     | 16.49      | 3.17                     | 85.70  | .001     |
| Gender   | .86      | 2.37       | 1.26                     | 4.44   | <.01     |
| ARSMA-II | .18      | 1.19       | .92                      | 1.56   | .19      |
| Step 2   |          |            |                          |        |          |
| LogAge   | 2.91     | 18.41      | 3.36                     | 101.05 | .01      |
| Gender   | .98      | 2.65       | 1.36                     | 5.20   | <.01     |
| ARSMA-II | .21      | 1.23       | .94                      | 1.62   | .13      |
| NFC-SF   | .03      | 1.03       | .99                      | 1.07   | .20      |
| PMQ      | .45      | 1.56       | 1.10                     | 2.22   | .01      |
| Constant | -13.55   | 000        |                          |        | .00      |

Note.  $n = 286$  (52 club drug users, 234 non-club drug users). ns were reduced because of missing values on some independent variables.  $X^2(3) = 21.19, p < .001$  for Step 1;  $\Delta X^2(1) = 8.17, p < .05$  for Step 2.

Table 8: Summary of the Hierarchical Logistic Regression Examining the Interaction Effects of Stress on Acculturation

*Summary of the Hierarchical Logistic Regression Examining the Interaction Effects of Stress on Acculturation*

| Variable                           | B     | Odds Ratio | 95% Confidence Intervals |       | P     |
|------------------------------------|-------|------------|--------------------------|-------|-------|
|                                    |       |            | Lower                    | Upper |       |
| <b>Step 1</b>                      |       |            |                          |       |       |
| ARSMA-II                           | .23   | 1.25       | .98                      | 1.61  | .08   |
| DASS(Anxiety subscale)             | .008  | 1.01       | .98                      | 1.04  | .63   |
| <b>Step 2</b>                      |       |            |                          |       |       |
| ARSMA-II                           | .24   | 1.28       | .99                      | 1.65  | .06   |
| DASS(Anxiety subscale)             | .02   | 1.02       | .98                      | 1.05  | .39   |
| DASS(Anxiety subscale) by ARSMA-II | -.02  | .98        | .96                      | 1.01  | .24   |
| Constant                           | -1.51 | .22        |                          |       | <.001 |

Note.  $n = 294$  (54 club drug users, 240 non-club drug users). ns were reduced because of missing values on some independent variables.  $X^2(2) = 3.72$   $p < .16$  for Step 1;  $\Delta X^2(1) = 1.41$ ,  $p = .24$  for Step 2.

Table 9: Summary of the Hierarchical Logistic Regression Examining the Interaction Effects of Alexithymia on Anxiety

*Summary of the Hierarchical Logistic Regression Examining the Interaction Effects of Alexithymia on Anxiety*

| Variable                      | B     | Odds Ratio | 95% Confidence Intervals |       | P     |
|-------------------------------|-------|------------|--------------------------|-------|-------|
|                               |       |            | Lower                    | Upper |       |
| <b>Step 1</b>                 |       |            |                          |       |       |
| DASS(Anxiety subscale)        | -.006 | .99        | .95                      | 1.04  | .80   |
| TAS                           | <.001 | 1.00       | .97                      | 1.03  | .99   |
| <b>Step 2</b>                 |       |            |                          |       |       |
| DASS(Anxiety subscale)        | .004  | 1.00       | .96                      | 1.06  | .87   |
| TAS                           | .001  | 1.00       | .97                      | 1.03  | .93   |
| TAS by DASS(Anxiety subscale) | -.004 | 1.00       | .99                      | 1.00  | .05   |
| Constant                      | -1.33 | .25        |                          |       | <.001 |

Note.  $n = 300$  (58 club drug users, 242 non-club drug users). ns were reduced because of missing values on some independent variables.  $X^2(2) = .09, p < .96$  for Step 1;  $\Delta X^2(1) = 4.13, p < .05$  for Step 2.

Table 10: Summary of the Hierarchical Logistic Regression Examining the Interaction Effects of Alexithymia on Depression

*Summary of the Hierarchical Logistic Regression Examining the Interaction Effects of Alexithymia on Depression*

| Variable                         | B     | Odds Ratio | 95% Confidence Intervals |       | p     |
|----------------------------------|-------|------------|--------------------------|-------|-------|
|                                  |       |            | Lower                    | Upper |       |
| <b>Step 1</b>                    |       |            |                          |       |       |
| DASS(Depression subscale)        | .01   | 1.01       | .97                      | 1.05  | .54   |
| TAS                              | -.01  | .99        | .96                      | 1.02  | .64   |
| <b>Step 2</b>                    |       |            |                          |       |       |
| DASS(Depression subscale)        | .02   | 1.02       | .98                      | 1.06  | .41   |
| TAS                              | -.01  | .99        | .97                      | 1.03  | .71   |
| TAS by DASS(Depression subscale) | -.002 | 1.00       | 1.00                     | 1.00  | .32   |
| Constant                         | -1.41 | .25        |                          |       | <.001 |

Note.  $n = 297$  (54 club drug users, 239 non-club drug users). ns were reduced because of missing values on some independent variables.  $X^2(2) = .41, p = .81$  for Step 1;  $\Delta X^2(1) = 1.05, p = .31$  for Step 2.



Table 11: Summary of the Hierarchical Logistic Regression Examining the Interaction Effects of Alexithymia on Negative Affect

*Summary of the Hierarchical Logistic Regression Examining the Interaction Effects of Alexithymia on Negative Affect*

| Variable                         | B     | Odds Ratio | 95% Confidence Intervals |       | P     |
|----------------------------------|-------|------------|--------------------------|-------|-------|
|                                  |       |            | Lower                    | Upper |       |
| <b>Step 1</b>                    |       |            |                          |       |       |
| PANAS-X (Negative Affect)        | .41   | 1.51       | 1.00                     | 2.28  | .05   |
| TAS-20                           | .002  | 1.00       | .98                      | 1.03  | .87   |
| <b>Step 2</b>                    |       |            |                          |       |       |
| PANAS-X (Negative Affect)        | .41   | 1.51       | 1.00                     | 2.28  | .05   |
| TAS-20                           | .001  | 1.00       | .97                      | 1.03  | .95   |
| TAS by PANAS-X (Negative Affect) | .01   | 1.01       | .97                      | 1.05  | .60   |
| Constant                         | -1.48 | .23        |                          |       | <.001 |

Note.  $n = 307$  (58 club drug users, 249 non-club drug users). ns were reduced because of missing values on some independent variables.  $X^2(2) = 4.09, p = .13$  for Step 1;  $\Delta X^2(1) = .27, p = .60$  for Step 2.

Table 12: Summary of the Hierarchical Logistic Regression Examining the Interaction Effects of Need for Cognition on Anxiety

*Summary of the Hierarchical Logistic Regression Examining the Interaction Effects of Need for Cognition on Anxiety*

| Variable                          | B     | Odds Ratio | 95% Confidence Intervals |       | P     |
|-----------------------------------|-------|------------|--------------------------|-------|-------|
|                                   |       |            | Lower                    | Upper |       |
| <b>Step 1</b>                     |       |            |                          |       |       |
| DASS (Anxiety subscale)           | -.002 | 1.00       | .96                      | 1.04  | .95   |
| NFC-SF                            | .04   | 1.04       | 1.01                     | 1.08  | .03   |
| <b>Step 2</b>                     |       |            |                          |       |       |
| DASS (Anxiety subscale)           | -.001 | 1.00       | .96                      | 1.04  | .95   |
| NFC-SF                            | .04   | 1.04       | 1.01                     | 1.08  | .03   |
| DASS (Anxiety subscale) by NFC-SF | <.001 | 1.00       | 1.00                     | 1.01  | .96   |
| Constant                          | -1.48 | .23        |                          |       | <.001 |

Note.  $n = 297$  (57 club drug users, 240 non-club drug users). ns were reduced because of missing values on some independent variables.  $X^2(2) = 5.03, p < .08$  for Step 1;  $\Delta X^2(1) = .003, p = .96$  for Step 2.

Table 13: Summary of the Hierarchical Logistic Regression Examining the Interaction Effects of PMQ on PolyDrug Use

*Summary of the Hierarchical Logistic Regression Examining the Interaction Effects of PMQ on PolyDrug Use*

| Variable                 | B     | Odds Ratio | 95% Confidence Intervals |       | P     |
|--------------------------|-------|------------|--------------------------|-------|-------|
|                          |       |            | Lower                    | Upper |       |
| Step 1                   |       |            |                          |       |       |
| Polysubstance Use        | 1.73  | 5.61       | 2.16                     | 14.58 | <.001 |
| PMQ                      | .20   | 1.22       | .89                      | 1.66  | .23   |
| Step 2                   |       |            |                          |       |       |
| Polysubstance Use        | 1.82  | 6.17       | 2.21                     | 17.23 | .001  |
| PMQ                      | .59   | 1.80       | .70                      | 4.59  | .22   |
| PMQ by Polysubstance Use | -.44  | .65        | .24                      | 1.75  | .39   |
| Constant                 | -2.95 | .05        |                          |       | <.001 |

Note.  $n = 304$  (57 club drug users, 247 non-club drug users). ns were reduced because of missing values on some independent variables.  $X^2(2) = 19.82, p < .001$  for Step 1;  $\Delta X^2(1) = .73, p = .39$  for Step 2.

Table 14: Summary of the Hierarchical Logistic Regression Examining the Interaction Effects of NFC on SSS

*Summary of the Hierarchical Logistic Regression Examining the Interaction Effects of NFC on SSS*

| Variable        | <i>B</i> | Odds Ratio | 95% Confidence Intervals |       | <i>P</i> |
|-----------------|----------|------------|--------------------------|-------|----------|
|                 |          |            | Lower                    | Upper |          |
| Step 1          |          |            |                          |       |          |
| SSS-V           | .16      | 1.17       | 1.10                     | 1.24  | <.001    |
| NFC-SF          | .03      | 1.03       | .99                      | 1.08  | .12      |
| Step 2          |          |            |                          |       |          |
| SSS-V           | .15      | 1.16       | 1.09                     | 1.24  | <.001    |
| NFC-SF          | .01      | 1.01       | .97                      | 1.06  | .56      |
| NFC-SF by SSS-V | .01      | 1.01       | 1.00                     | 1.02  | .05      |
| Constant        | -1.78    | .17        |                          |       | <.001    |

Note.  $n = 281$  (52 club drug users, 229 non-club drug users). ns were reduced because of missing values on some independent variables.  $X^2(2) = 32.72, p < .001$  for Step 1;  $\Delta X^2(1) = 3.75, p = .05$  for Step 2.

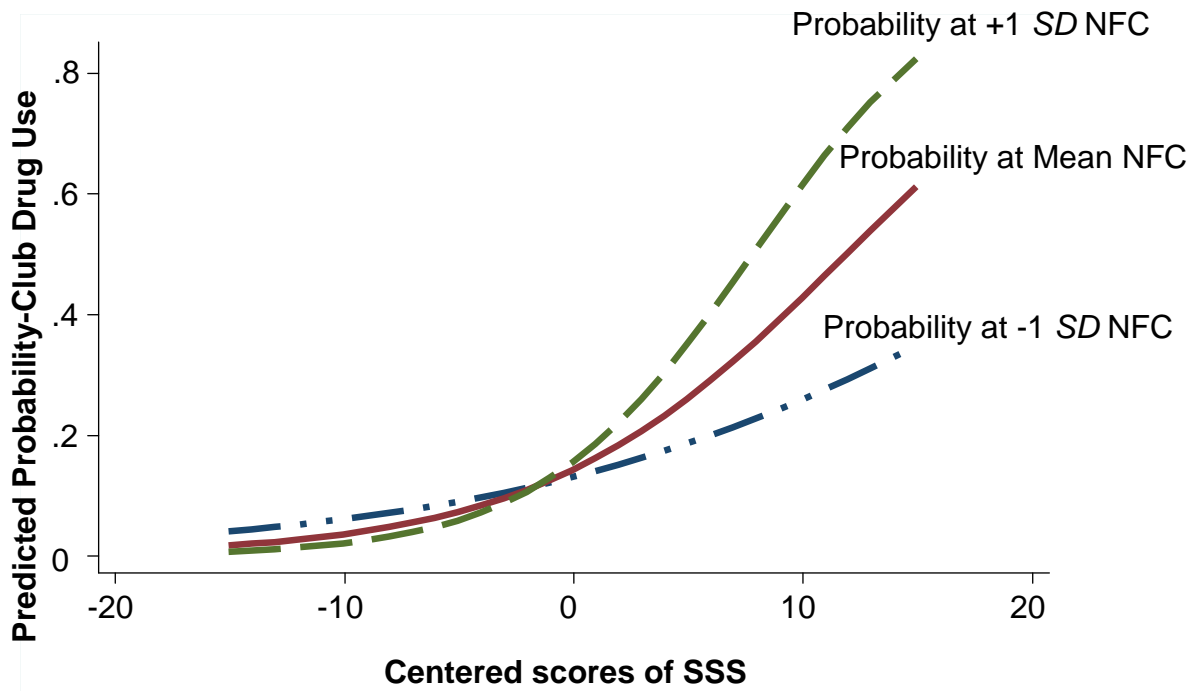


Figure 1: Moderated Need for Cognition (centered NFC-SF) effect of Sensation Seeking (centered SSS) on probabilities of club drug use.

## Appendix A: Demographic Survey

Participant # \_\_\_\_\_

How old are you? \_\_\_\_\_

Gender:        \_\_\_\_\_ Male                \_\_\_\_\_ Female

With which ethnic/racial group do you identify with? (please check one)

- Hispanic/Latino
- Mexican National
- White/Caucasian
- Oriental/ Asian American/ Pacific Islander
- Black/African American
- Native American

What is your level of education?

- Less than High School
- High School or equivalent
- Some College
- Vocational School/Associate's Degree
- College Graduate (e.g., B.A., B.S.)
- Some Post-Graduate training

Are you a member of a Greek organization?

- Yes
- No

## Appendix B: Acculturation and Rating Scale for Mexican Americans II (ARMSA-II)

### ARMSA-II

(a) Last grade completed in school:

(Circle your choice)

1. Elementary school
2. 7-8
3. 9-12
4. 1-2 years of college
5. 3-4 years of college
6. College graduate or higher

(b) In what country? \_\_\_\_\_

(Circle the generation that best applies to you. Circle only one.)

1. 1<sup>st</sup> generation = You were born in Mexico or other country.
2. 2<sup>nd</sup> generation = You were born in USA; either parent born in Mexico or other country
3. 3<sup>rd</sup> generation = You were born in USA, both parents born in USA and all grandparents born in Mexico or other country.
4. 4<sup>th</sup> generation = You and your parents born in USA and at least one grandparent born in Mexico or other country with remainder born in the USA.
5. 5<sup>th</sup> generation = You and your parents born in the USA and all grandparents born in the USA.

Scale I

Circle a number between 1-5 next to each item that best applies

|  | 1                | 2  | 3                         | 4                                | 5  |
|--|------------------|--|---------------------------|----------------------------------|--|
|  | Not<br>at<br>all | Very<br>little<br>or<br>not<br>very<br>often | Mo-<br>der-<br>ate-<br>ly | Mu-<br>ch<br>or<br>Very<br>often | Extre-<br>mely<br>often<br>or<br>al-<br>most<br>always |
| 1. I speak Spanish                                       | 1                | 2  | 3                         | 4                                | 5  |
| 2. I speak English                                       | 1                | 2  | 3                         | 4                                | 5  |
| 3. I enjoy speaking Spanish                              | 1                | 2  | 3                         | 4                                | 5  |
| 4. I associate with Anglos                               | 1                | 2  | 3                         | 4                                | 5  |
| 5. I associate with Mexicans and/or<br>Mexican Americans | 1                | 2  | 3                         | 4                                | 5  |
| 6. I enjoy listening to Spanish language<br>music        | 1                | 2  | 3                         | 4                                | 5  |
| 7. I enjoy listening to English language<br>music        | 1                | 2  | 3                         | 4                                | 5  |
| 8. I enjoy Spanish language TV                           | 1                | 2  | 3                         | 4                                | 5  |
| 9. I enjoy English language TV                           | 1                | 2  | 3                         | 4                                | 5  |
| 10. I enjoy English language movies                      | 1                | 2  | 3                         | 4                                | 5  |
| 11. I enjoy Spanish language movies                      | 1                | 2  | 3                         | 4                                | 5  |
| 12. I enjoy reading (e.g., books in Spanish)             | 1                | 2  | 3                         | 4                                | 5  |
| 13. I enjoy reading (e.g., books in English)             | 1                | 2  | 3                         | 4                                | 5  |
| 14. I write (e.g., letters in Spanish)                   | 1                | 2  | 3                         | 4                                | 5  |
| 15. I write (e.g., letters in English)                   | 1                | 2  | 3                         | 4                                | 5  |



Circle a number between 1-5 next to each item that best applies

|  | 1                | 2  | 3                         | 4                                | 5  |
|--|------------------|--|---------------------------|----------------------------------|--|
|  | Not<br>at<br>all | Very<br>little<br>or<br>not<br>very<br>often | Mo-<br>der-<br>ate-<br>ly | Mu-<br>ch<br>or<br>Very<br>often | Extre-<br>mely<br>often<br>or<br>al-<br>most<br>always |
| 16. My thinking is done in the English language                | 1                | 2  | 3                         | 4                                | 5  |
| 17. My thinking is done in the Spanish language                | 1                | 2  | 3                         | 4                                | 5  |
| 18. My contact with Mexico has been                            | 1                | 2  | 3                         | 4                                | 5  |
| 19. My contact with the USA has been                           | 1                | 2  | 3                         | 4                                | 5  |
| 20. My father identifies or identified himself as 'Mexicano'   | 1                | 2  | 3                         | 4                                | 5  |
| 21. My mother identifies or identified herself as 'Mexicana'   | 1                | 2  | 3                         | 4                                | 5  |
| 22. My friends, while I was growing up, were of Mexican origin | 1                | 2  | 3                         | 4                                | 5  |
| 23. My friends, while I was growing up, were of Anglo origin   | 1                | 2  | 3                         | 4                                | 5  |
| 24. My family cooks Mexican foods                              | 1                | 2  | 3                         | 4                                | 5  |
| 25. My friends now are of Anglo American                       | 1                | 2  | 3                         | 4                                | 5  |
| 26. My friends now are of Mexican American                     | 1                | 2  | 3                         | 4                                | 5  |
| 27. I like to identify myself as an Anglo American             | 1                | 2  | 3                         | 4                                | 5  |
| 28. I like to identify myself as a Mexican American            | 1                | 2  | 3                         | 4                                | 5  |
| 29. I like to identify myself as a Mexican                     | 1                | 2  | 3                         | 4                                | 5  |
| 30. I like to identify myself as an American                   | 1                | 2  | 3                         | 4                                | 5  |

## Scale 2

Use the scale below to answer questions 1-18 below.

|   | 1                | 2  | 3                         | 4                                | 5  |
|---|------------------|--|---------------------------|----------------------------------|--|
|   | Not<br>at<br>all | Very<br>little<br>or<br>not<br>very<br>often | Mo-<br>der-<br>ate-<br>ly | Mu-<br>ch<br>or<br>Very<br>often | Extre-<br>mely<br>often<br>or<br>al-<br>most<br>always |
| 1. I have difficulty accepting some ideas held by Anglos                                      | 1                | 2  | 3                         | 4                                | 5  |
| 2. I have difficulty accepting certain attitudes held by Anglos                               | 1                | 2  | 3                         | 4                                | 5  |
| 3. I have difficulty accepting some behaviors exhibited by Anglos                             | 1                | 2  | 3                         | 4                                | 5  |
| 4. I have difficulty accepting some values held by some Anglos                                | 1                | 2  | 3                         | 4                                | 5  |
| 5. I have difficulty accepting certain practices and customs commonly found in some Anglos    | 1                | 2  | 3                         | 4                                | 5  |
| 6. I have, or think I would have, difficulty accepting Anglos as close personal friends       | 1                | 2  | 3                         | 4                                | 5  |
| 7. I have difficulty accepting ideas held by some Mexicans                                    | 1                | 2  | 3                         | 4                                | 5  |
| 8. I have difficulties accepting certain attitudes held by Mexicans                           | 1                | 2  | 3                         | 4                                | 5  |
| 9. I have difficulty accepting some behaviors exhibited by Mexicans                           | 1                | 2  | 3                         | 4                                | 5  |
| 10. I have difficulty accepting some values held by some Mexicans                             | 1                | 2  | 3                         | 4                                | 5  |
| 11. I have difficulty accepting certain practices and customs commonly found in some Mexicans | 1                | 2  | 3                         | 4                                | 5  |
|   | 1                | 2  | 3                         | 4                                | 5  |

|  | Not<br>at<br>all | Very<br>little<br>or<br>not<br>very<br>often | Mo-<br>der-<br>ate-<br>ly | Mu-<br>ch<br>or<br>Very<br>often | Extre-<br>mely<br>often<br>or<br>al-<br>most<br>always |
|--|------------------|--|---------------------------|----------------------------------|--|
| 12. I have, or think I would have, difficulty accepting Mexicans as close personal friends             | 1                | 2  | 3                         | 4                                | 5  |
| 13. I have difficulty accepting ideas held by some Mexican Americans                                   | 1                | 2  | 3                         | 4                                | 5  |
| 14. I have difficulty accepting certain attitudes held by Mexican Americans                            | 1                | 2  | 3                         | 4                                | 5  |
| 15. I have difficulty accepting some behaviors exhibited by Mexican Americans                          | 1                | 2  | 3                         | 4                                | 5  |
| 16. I have difficulty accepting some values held by Mexican Americans                                  | 1                | 2  | 3                         | 4                                | 5  |
| 17. I have difficulty accepting certain practices and customs commonly found in some Mexican Americans | 1                | 2  | 3                         | 4                                | 5  |
| 18. I have, or think I would have, difficulty accepting Mexican Americans as close personal friends    | 1                | 2  | 3                         | 4                                | 5  |

## Appendix C: Depression, Anxiety, and Stress Scale (DASS)

### DASS

Please read each statement and circle a number 0, 1, 2 or 3, which indicates how much the statement applied to you *over the past week*. There are no right or wrong answers.

The rating scale is as follows:

**0** Did not apply to me at all

**1** Applied to me to some degree, or some of the time.

**2** Applied to me a considerable degree, or a good part of the time.

**3** Applied to me very much, or most of the time.

|   |   |   |   |   |
|---|---|---|---|---|
| 1. I found myself getting upset by quite trivial things   | 0 | 1 | 2 | 3 |
| 2. I was aware of dryness of my mouth   | 0 | 1 | 2 | 3 |
| 3. I couldn't seem to experience any positive feeling at all  | 0 | 1 | 2 | 3 |
| 4. I experienced breathing difficulty (e.g., excessively rapid breathing, breathlessness in the absence of physical exertion) | 0 | 1 | 2 | 3 |
| 5. I just couldn't seem to get going  | 0 | 1 | 2 | 3 |
| 6. I tended to over-react to situations   | 0 | 1 | 2 | 3 |
| 7. I had a feeling of shakiness (e.g., legs going to give way)  | 0 | 1 | 2 | 3 |
| 8. I found it difficult to relax  | 0 | 1 | 2 | 3 |
| 9. I found myself in situations that made me so anxious I was most relieved when they ended                                   | 0 | 1 | 2 | 3 |
| 10. I felt that I had nothing to look forward to  | 0 | 1 | 2 | 3 |
| 11. I found myself getting upset rather easily  | 0 | 1 | 2 | 3 |
| 12. I felt that I was using a lot of nervous energy   | 0 | 1 | 2 | 3 |
| 13. I felt sad and depressed  | 0 | 1 | 2 | 3 |
| 14. I found myself getting impatient when I was delayed in any way (e.g., lifts, traffic lights, being kept waiting)          | 0 | 1 | 2 | 3 |
| 15. I had a feeling of faintness  | 0 | 1 | 2 | 3 |
| 16. I felt that I had lost interest in just about everything  | 0 | 1 | 2 | 3 |
| 17. I felt I wasn't worth much as a person  | 0 | 1 | 2 | 3 |
| 18. I felt that I was rather touchy   | 0 | 1 | 2 | 3 |
| 19. I perspired noticeably (e.g., hands sweaty) in the absence of high temperatures or physical exertion                      | 0 | 1 | 2 | 3 |
| 20. I felt scared without any good reason   | 0 | 1 | 2 | 3 |

|  |   |   |   |   |
|--|---|---|---|---|
| 21. I felt that life wasn't worthwhile   | 0 | 1 | 2 | 3 |
| 22. I found it hard to wind down   | 0 | 1 | 2 | 3 |
| 23. I had difficulty in swallowing   | 0 | 1 | 2 | 3 |
| 24. I couldn't seem to get any enjoyment out of the things I did   | 0 | 1 | 2 | 3 |
| 25. I was aware of the action of my heart in the absence of physical exertion (e.g., sense of heart rate increase, heart missing a beat) | 0 | 1 | 2 | 3 |
| 26. I felt down-hearted and blue   | 0 | 1 | 2 | 3 |
| 27. I found that I was very irritable  | 0 | 1 | 2 | 3 |
| 28. I felt I was close to panic  | 0 | 1 | 2 | 3 |
| 29. I found it hard to calm down after something upset me  | 0 | 1 | 2 | 3 |
| 30. I feared that I would be "thrown" by some trivial but unfamiliar task  | 0 | 1 | 2 | 3 |
| 31. I was unable to become enthusiastic about anything   | 0 | 1 | 2 | 3 |
| 32. I found it difficult to tolerate interruptions to what I was doing   | 0 | 1 | 2 | 3 |
| 33. I was in a state of nervous tension  | 0 | 1 | 2 | 3 |
| 34. I felt I was pretty worthless  | 0 | 1 | 2 | 3 |
| 35. I was intolerant of anything that kept me from getting on with what I was doing  | 0 | 1 | 2 | 3 |
| 36. I felt terrified   | 0 | 1 | 2 | 3 |
| 37. I could see nothing in the future to be hopeful about  | 0 | 1 | 2 | 3 |
| 38. I felt that life was meaningless   | 0 | 1 | 2 | 3 |
| 39. I found myself getting agitated  | 0 | 1 | 2 | 3 |
| 40. I was worried about situations in which I might panic and make a fool of myself  | 0 | 1 | 2 | 3 |
| 41. I experienced trembling (e.g., in the hands)   | 0 | 1 | 2 | 3 |
| 42. I found it difficult to work up the initiative to do things  | 0 | 1 | 2 | 3 |

## Appendix D: Positive and Negative Affect Scale- Form X (PANAS-X)

### PANAS-X

This scale consists of a number of words and phrases that describe different feelings and emotions. Read each item and then mark the appropriate answer in the space next to that word. Indicate to what extent you have felt this way during the past few weeks. Use the following scale to record your answers:

| 1<br>very slightly<br>or not at all | 2<br>a little | 3<br>moderately | 4<br>quite a bit                 | 5<br>extremely |
|-------------------------------------|---------------|-----------------|----------------------------------|----------------|
| _____ cheerful                      | _____ sad     | _____ active    | _____ angry at self              |                |
| _____ disgusted                     | _____ calm    | _____ guilty    | _____ enthusiastic               |                |
| _____ attentive                     | _____ afraid  | _____ joyful    | _____ downhearted                |                |
| _____ bashful                       | _____ tired   | _____ nervous   | _____ sheepish                   |                |
| _____ sluggish                      | _____ amazed  | _____ lonely    | _____ distressed                 |                |
| _____ daring                        | _____ shaky   | _____ sleepy    | _____ blameworthy                |                |
| _____ surprised                     | _____ happy   | _____ excited   | _____ determined                 |                |
| _____ strong                        | _____ timid   | _____ hostile   | _____ frightened                 |                |
| _____ scornful                      | _____ alone   | _____ proud     | _____ astonished                 |                |
| _____ relaxed                       | _____ alert   | _____ jittery   | _____ interested                 |                |
| _____ irritable                     | _____ upset   | _____ lively    | _____ loathing                   |                |
| _____ delighted                     | _____ angry   | _____ ashamed   | _____ confident                  |                |
| _____ inspired                      | _____ bold    | _____ at ease   | _____ energetic                  |                |
| _____ fearless                      | _____ blue    | _____ scared    | _____ concentrating              |                |
| _____ disgusted-<br>with self       | _____ shy     | _____ drowsy    | _____ dissatisfied-<br>with self |                |

---

The Positive and Negative Affect Schedule--Expanded Form (PANAS-X) © 1999, D. Watson & L. A. Clark.  
Reproduced with permission.

## Appendix E: Toronto Alexithymia Scale- 20 (TAS-20)

### T A S – 20

Using the scale provided as a guide, indicate how much you agree or disagree with each of the following statements by circling the corresponding number. Give only one answer for each statement.

Circle 1 if you **STRONGLY DISAGREE**  
 Circle 2 if you **MODERATELY DISAGREE**  
 Circle 3 if you **NEITHER DISAGREE NOR AGREE**  
 Circle 4 if you **MODERATELY AGREE**  
 Circle 5 if you **STRONGLY AGREE**

|   | Strongly<br>Disagree | Moderately<br>Disagree | Neither<br>Disagree<br>Nor Agree | Moderately<br>Agree | Strongly<br>Agree |
|---|----------------------|------------------------|----------------------------------|---------------------|-------------------|
| 1. I am often confused about what emotion I am feeling.                                       | 1                    | 2                      | 3                                | 4                   | 5                 |
| 2. It is difficult for me to find the right words for my feelings.                            | 1                    | 2                      | 3                                | 4                   | 5                 |
| 3. I have physical sensations that even doctors don't understand.                             | 1                    | 2                      | 3                                | 4                   | 5                 |
| 4. I am able to describe my feelings easily.  | 1                    | 2                      | 3                                | 4                   | 5                 |
| 5. I prefer to analyze problems rather than just describe them.                               | 1                    | 2                      | 3                                | 4                   | 5                 |
| 6. When I am upset, I don't know if I am sad, frightened, or angry.                           | 1                    | 2                      | 3                                | 4                   | 5                 |
| 7. I am often puzzled by sensations in my body.   | 1                    | 2                      | 3                                | 4                   | 5                 |
| 8. I prefer to just let things happen rather than to understand why they turned out that way. | 1                    | 2                      | 3                                | 4                   | 5                 |
| 9. I have feelings that I can't quite identify.   | 1                    | 2                      | 3                                | 4                   | 5                 |
| 10. Being in touch with emotions is essential.  | 1                    | 2                      | 3                                | 4                   | 5                 |

---

T A S – 20

|   | Strongly<br>Disagree | Moderately<br>Disagree | Neither<br>Disagree<br>Nor Agree | Moderately<br>Agree | Strongly<br>Agree |
|---|----------------------|------------------------|----------------------------------|---------------------|-------------------|
| 11. I find it hard to describe how I feel about people.                                 | 1                    | 2                      | 3                                | 4                   | 5                 |
| 12. People tell me to describe my feelings more.  | 1                    | 2                      | 3                                | 4                   | 5                 |
| 13. I don't know what's going on inside me.   | 1                    | 2                      | 3                                | 4                   | 5                 |
| 14. I often don't know why I am angry.  | 1                    | 2                      | 3                                | 4                   | 5                 |
| 15. I prefer talking to people about their daily activities rather than their feelings. | 1                    | 2                      | 3                                | 4                   | 5                 |
| 16. I prefer to watch "light" entertainment shows rather than psychological dramas      | 1                    | 2                      | 3                                | 4                   | 5                 |
| 17. It is difficult for me to reveal my innermost feelings, even to close friends.      | 1                    | 2                      | 3                                | 4                   | 5                 |
| 18. I can feel close to someone, even in moments of silence.                            | 1                    | 2                      | 3                                | 4                   | 5                 |
| 19. I find examination of my feelings useful in solving personal problems.              | 1                    | 2                      | 3                                | 4                   | 5                 |
| 20. Looking for hidden meanings in movies or plays distracts from their enjoyment.      | 1                    | 2                      | 3                                | 4                   | 5                 |



## Appendix F: Club Drug/Polysubstance Use Assessment

### Club Drug/Polysubstance Use Assessment

1. Have you ever tried Ecstasy?  Yes  No  
(MDMA, X, E, Pills, Rolls, “The Bean”)  
(If no use, skip to question 9)
2. How many days in the past 30 days have you used Ecstasy? \_\_\_\_\_
3. How old were you when you first tried Ecstasy? \_\_\_\_\_
4. Where do you most often get Ecstasy? (mark only one)  
 Clubs  Parties  Raves  Street Dealer  Family/Friends  Other \_\_\_\_\_
5. Where do you most often use Ecstasy? (mark only one)  
 Clubs  Parties  Raves  Street Dealer  Family/Friends  Other \_\_\_\_\_
6. How often do you usually buy Ecstasy? (mark only one)  
 Once a day  
 2-3 times/week  
 Once a week  
 2-3 times/month  
 Once/month or less  
 I don't buy
7. If you buy, how much Ecstasy do you buy at one time (# of tabs) \_\_\_\_\_
8. If you buy, how much does this quantity cost you? \$\_\_\_\_\_
- 
9. Have you ever tried GHB?  Yes  No  
(G, GBL, BD, Liquid X)  
(If no use, skip to question 17)
10. How many days in the past 30 days have you used GHB? \_\_\_\_\_
11. How old were you when you first tried GHB? \_\_\_\_\_
12. Where do you most often get GHB? (mark only one)  
 Clubs  Parties  Raves  Street Dealer  Family/Friends  Other \_\_\_\_\_
13. Where do you most often use GHB? (mark only one)  
 Clubs  Parties  Raves  Street Dealer  Family/Friends  Other \_\_\_\_\_

**14. How often do you usually buy GHB? (mark only one)**

- Once a day
- 2-3 times/week
- Once a week
- 2-3 times/month
- Once/month or less
- I don't buy

**15. If you buy, how much GHB do you buy at one time (# of capfuls) \_\_\_\_\_**

**16. If you buy, how much does this quantity cost you? \$\_\_\_\_\_**

---

**17. Have you ever tried Ketamine?  Yes  No**

**(K, Special K, Vitamin K, Kat food)**

**(If no use, skip to question 25)**

**18. How many days in the past 30 days have you used Ketamine? \_\_\_\_\_**

**19. How old were you when you first tried Ketamine? \_\_\_\_\_**

**20. Where do you most often get Ketamine? (mark only one)**

Clubs  Parties  Raves  Street Dealer  Family/Friends  Other \_\_\_\_\_

**21. Where do you most often use Ketamine? (mark only one)**

Clubs  Parties  Raves  Street Dealer  Family/Friends  Other \_\_\_\_\_

**22. How often do you usually buy Ketamine? (mark only one)**

- Once a day
- 2-3 times/week
- Once a week
- 2-3 times/month
- Once/month or less
- I don't buy

**23. If you buy, how much Ketamine do you buy at one time (# of vial or pills) \_\_\_\_\_**

**24. If you buy, how much does this quantity cost you? \$\_\_\_\_\_**

---

**25. Have you ever tried LSD?  Yes  No**

**(Acid, dose, tabs)**

**(If no use, skip to question 33)**

**26. How many days in the past 30 days have you used LSD? \_\_\_\_\_**

**27. How old were you when you first tried LSD? \_\_\_\_\_**

**28. Where do you most often get LSD? (mark only one)**

Clubs  Parties  Raves  Street Dealer  Family/Friends  Other \_\_\_\_\_

**29. Where do you most often use LSD? (mark only one)**

Clubs  Parties  Raves  Street Dealer  Family/Friends  Other \_\_\_\_\_

**30. How often do you usually buy LSD? (mark only one)**

Once a day

2-3 times/week

Once a week

2-3 times/month

Once/month or less

I don't buy

**31. If you buy, how much LSD do you buy at one time (# of hits) \_\_\_\_\_**

**32. If you buy, how much does this quantity cost you? \$\_\_\_\_\_**

---

**33. Have you ever tried Methamphetamine?  Yes  No**

(Speed, Crystal meth, Ice, Crank)

(If no use, skip to question 41)

**34. How many days in the past 30 days have you used Methamphetamines? \_\_\_\_\_**

**35. How old were you when you first tried Methamphetamines? \_\_\_\_\_**

**36. Where do you most often get Methamphetamine? (mark only one)**

Clubs  Parties  Raves  Street Dealer  Family/Friends  Other \_\_\_\_\_

**37. Where do you most often use Methamphetamine? (mark only one)**

Clubs  Parties  Raves  Street Dealer  Family/Friends  Other \_\_\_\_\_

**38. How often do you usually buy Methamphetamine? (mark only one)**

Once a day

2-3 times/week

Once a week

2-3 times/month

Once/month or less

I don't buy

**39. If you buy, how much Methamphetamine do you buy at one time \_\_\_\_\_**

(# of doses)

**40. If you buy, how much does this quantity cost you? \$\_\_\_\_\_**

41. Have you ever tried Psilocybin Mushrooms?  Yes  No

(Magic Mushrooms, Shrooms, Mushies, Liberty Caps, Fly-agaric)

(If no use, skip to question 49)

42. How many days in the past 30 days have you used mushrooms? \_\_\_\_\_

43. How old were you when you first tried mushrooms? \_\_\_\_\_

44. Where do you most often get mushrooms? (mark only one)

Clubs  Parties  Raves  Street Dealer  Family/Friends  Other \_\_\_\_\_

45. Where do you most often use mushrooms? (mark only one)

Clubs  Parties  Raves  Street Dealer  Family/Friends  Other \_\_\_\_\_

46. How often do you usually buy mushrooms? (mark only one)

Once a day

2-3 times/week

Once a week

2-3 times/month

Once/month or less

I don't buy

47. If you buy, how much mushrooms do you buy at one time (# of grams) \_\_\_\_\_

48. If you buy, how much does this quantity cost you? \$\_\_\_\_\_

---

49. Have you ever tried Marijuana?  Yes  No

(Pot, Dope, Grass, Weed, Mary Jane, Chronic, Reefer, Doobie, Roach, Joints)

(If no use, skip to question 57)

50. How many days in the past 30 days have you used Marijuana? \_\_\_\_\_

51. How old were you when you first tried Marijuana? \_\_\_\_\_

52. Where do you most often get Marijuana? (mark only one)

Clubs  Parties  Raves  Street Dealer  Family/Friends  Other \_\_\_\_\_

53. Where do you most often use Marijuana? (mark only one)

Clubs  Parties  Raves  Street Dealer  Family/Friends  Other \_\_\_\_\_

**54. How often do you usually buy Marijuana? (mark only one)**

- Once a day
- 2-3 times/week
- Once a week
- 2-3 times/month
- Once/month or less
- I don't buy

**55. If you buy, how much Marijuana do you buy at one time \_\_\_\_\_**

**(in ounces or fractions of ounces)**

**56. If you buy, how much does this quantity cost you? \$\_\_\_\_\_**

---

**57. Have you ever consumed alcohol?     Yes             No**

**(If no use, skip to question 58)**

**58. How many days in the past 30 days have you consumed alcohol? \_\_\_\_\_**

**59. How old were you when you first consumed alcohol? \_\_\_\_\_**

**60. Where do you most often drink alcohol? (mark only one)**

Clubs    Parties    Raves    Street Dealer    Family/Friends    Other \_\_\_\_\_

**61. How often do you usually buy alcohol? (mark only one)**

- Once a day
- 2-3 times/week
- Once a week
- 2-3 times/month
- Once/month or less
- I don't buy

**62. If you buy, how much does this quantity cost you? \$\_\_\_\_\_**

**63. What is the average number of nights spent drinking per week? \_\_\_\_\_**

**64. What is the average number of drinks in one sitting? \_\_\_\_\_**

---

**65. What is your smoking status?**

\_\_\_\_\_ I smoke at least one cigarette per day;

**If so, how many cigarettes per day? \_\_\_\_\_**

\_\_\_\_\_ I smoke 1 to 6 cigarettes per week

\_\_\_\_\_ I smoke less than 1 cigarette per week

\_\_\_\_\_ I smoke less than one cigarette per month

\_\_\_\_\_ I no longer smoke, but in the past smoked at least 1 cigarette per day;

**If so, how many cigarettes per day? \_\_\_\_\_**

\_\_\_\_\_ I no longer smoke, but in the past smoked 1-6 cigarettes per week

\_\_\_\_\_ I have smoked a cigarette or a few, just to try it

\_\_\_\_\_ I have never smoked before, not even a puff

**66. About how many of your friends would you say have tried:**

**Ecstasy?**                     All    Most    Less than half    A few    None

**GHB?**                         All    Most    Less than half    A few    None

**Ketamine?**                 All    Most    Less than half    A few    None

**LSD?**                         All    Most    Less than half    A few    None

**Methamphetamine?**  All    Most    Less than half    A few    None

**Mushrooms?**             All    Most    Less than half    A few    None **Marijuana?**

All    Most    Less than half    A few    None

**Alcohol?**                     All    Most    Less than half    A few    None

**Cigarettes?**                 All    Most    Less than half    A few    None

**67. Which drugs do you most often use together? (mark all that apply)**

Alcohol

Ecstasy

GHB

Ketamine

LSD

Methamphetamine

Mushrooms

Marijuana

Cigarettes

Never used more than one substance

**68. Please list any other additional substances that you have used and were not mentioned in this questionnaire.**

## Appendix G: Sensation Seeking Scale- Form V (SSS-V)

### Sensation Seeking Scale- Form V (SSS-V)

#### Interest and preference test

Directions: each of the items below contains two choices, A and B. Please indicate which of the choices most describes your likes or the way you feel. In some cases you may find items in which both choices describe your likes or feelings. Please choose the one which better describes your likes or feelings. In some cases you may find that you do not like either choice. In these cases mark the choice you dislike least. Do not leave any items blank. It is important you respond to all items with only one choice, A or B. We are interested only in your like or feelings, not in how others feel about these things or how one is supposed to feel. There are no right or wrong answers as in other kinds of test. Be frank and give your honest appraisal of yourself.

1. A. I like “wild” uninhibited parties.  
B. I prefer quiet parties with good conversations.
2. A. There are some movies I enjoy seeing a second or even third time.  
B. I can’t stand watching a movie that I’ve seen before.
3. A. I often wish I could be a mountain climber.  
B. I can’t understand people who risk their necks climbing mountains.
4. A. I dislike all body odors  
B. I like some of the earthy body smells.
5. A. I get bored seeing the same old faces.  
B. I like the comfortable familiarity of everyday friends.
6. A. I like to explore a strange city or section of town myself, even if it means getting lost.  
B. I prefer a guide when I am in a place I don’t know well.
7. A. I dislike people who do or say things just to shock or upset others.  
B. When you can predict almost everything a person will do and say he or she must be a bore.
8. A. I usually don’t enjoy a movie or play where I can predict what will happen in advance.  
B. I don’t mind watching a movie or play where I can predict what will happen in advance.
9. A. I have tried marijuana or would like to  
B. I would never smoke marijuana.
10. A. I would not like to try any drug which might produce strange and dangerous effects on me.  
B. I would like to try some of the drugs that produce hallucinogens.
11. A. A sensible person avoids activities that are dangerous.  
B. I sometimes like to do things that are a little frightening.

12. A. I dislike “swingers” (people who are uninhibited and free about sex).  
B. I enjoy the company of real “swingers”.
13. A. I find that stimulants make me uncomfortable.  
B. I often like to get high (drinking liquor or smoking marijuana).
14. A. I like to try new foods that I have never tasted before.  
B. I order the dishes with which I am familiar so as to avoid disappointment and unpleasantness.
15. A. I enjoy looking at home movies, videos, or travel slides.  
B. Looking at someone’s home movies, videos, or travel slides bores me tremendously.
16. A. I would like to take up the sport of water skiing.  
B. I would not like to take up water skiing.
17. A. I would like to try surfboarding riding.  
B. I would not like to try surfboarding riding.
18. A. I would like to take off on a trip with no preplanned schedule or definite routes, or timetable.  
B. When I go on a trip I like to plan my route with no preplanned or definite routes or timetable.
19. A. I prefer the “down to earth” kinds of people as friends.  
B. I would like to make friends in some of the “far-out” groups like artists or “punks”.
20. A. I would not like to learn how to fly an airplane.  
B. I would like to learn to fly an airplane.
21. A. I prefer the surface of the water to the depths.  
B. I would like to go scuba diving.
22. A. I would like to meet some persons who are homosexual (men or women).  
B. I stay away from anyone I suspect of being “gay” or lesbian.
23. A. I would like to try parachuting.  
B. I would never want to try jumping out of a plane, with or without a parachute.
24. A. I prefer friends who are excitingly unpredictable.  
B. I prefer friends who are reliable and predictable.
25. A. I am not interested in experience for its own sake.  
B. I like to have new and exciting experiences and sensations even if they are a little frightening, unconventional, or illegal.
26. A. The essence of good art is in its clarity, symmetry of form, and harmony of colors.  
B. I often find beauty in the “clashing” colors and irregular forms of modern paintings.
27. A. I enjoy spending time in the familiar surroundings of home.  
B. I get very restless if I have to stay around home for any length of time.



28. A. I like to dive off the high board.  
B. I don't like the feeling I get standing on the high board. (or I don't go near it at all).
29. A. I like to date persons who are physically exciting.  
B. I like to date persons who share my values.
30. A. Heavy drinking usually ruins a party because some people get loud and boisterous.  
B. Keeping the drinks full is the key to a good party.
31. A. The worst social sin is to be rude.  
B. The worst social sin is to be a bore.
32. A. A person should have considerable sexual experience with each other.  
B. It's better if two married persons begin their sexual experience with each other.
33. A. Even if I had the money, I would not care to associate with flighty rich persons in the "jet set".  
B. I could conceive of myself seeking pleasures around the world with "jet set".
34. A. I like people who are sharp and witty even if they do sometimes insult others.  
B. I dislike people who have their fun at the expense of hurting the feelings of others.
35. A. There is altogether too much portrayal of sex in movies.  
B. I enjoy watching many of the "sexy" scenes in movies.
36. A. I feel best after taking a couple of drinks.  
B. Something is wrong with people who need liquor to feel good.
37. A. People should dress according to some standard of taste, neatness, and style.  
B. People should dress in individual ways even if the effects are sometimes strange.
38. A. Sailing long distances in small sailing crafts is foolhardy.  
B. I would like to sail a long distance in a small but seaworthy sailing craft.
39. A. I have no patience with dull or boring persons.  
B. I find something interesting in almost every person I talk to.
40. A. Skiing down a high mountain slope is a good way to end up on crutches.  
B. I think I would enjoy the sensations of skiing very fast down a high mountain slope.

## Appendix H: Need for Cognition- Short Form (NFC-SF)

### Need for Cognition Scale Short Form

On the following scale of 1 to 4 please rate the following statements:

4= strongly agree

3= agree

2= disagree

1= strongly disagree

1. I would prefer complex to simple problems. \_\_\_
2. I like to have the responsibility of handling a situation that requires a lot of thinking. \_\_\_
3. Thinking is not my idea of fun. \_\_\_
4. I would rather do something that requires little thought than something that is sure to challenge my thinking abilities. \_\_\_
5. I try to anticipate and avoid situations where there is likely chance I will have to think in depth about something. \_\_\_
6. I find satisfaction in deliberating hard and for long hours. \_\_\_
7. I only think as hard as I have to. \_\_\_
8. I prefer to think about small, daily projects to long-term ones. \_\_\_
9. I like tasks that require little thought once I have learned them. \_\_\_
10. The idea of relying on thought to make my way to the top appeals to me. \_\_\_
11. I really enjoy a task that involves coming up with new solutions to problems. \_\_\_
12. Learning new ways to think doesn't excite me very much. \_\_\_
13. I prefer my life to be filled with puzzles that I must solve. \_\_\_
14. The notion of thinking abstractly is appealing to me. \_\_\_
15. I would prefer a task that is intellectual, difficult, and important to one that is somewhat important but does not require much thought. \_\_\_
16. I feel relief rather than satisfaction after completing a task that required a lot of mental effort. \_\_\_
17. It's enough for me that something gets the job done; I don't care how or why it works. \_\_\_
18. I usually end up deliberating about issues even when they do not affect me personally. \_\_\_



3. I forgot to send a card for a birthday or anniversary. NA  
 |-----|-----|-----|-----|-----|-----|-----|-----|  
 (never) (3 times/ (6 or more  
 year) times/year)
4. I forgot to make an important phone call. NA  
 |-----|-----|-----|-----|-----|-----|-----|-----|  
 (never) (2 times/ (4 or more  
 week) times/week)
5. I told someone something that I did not mean to tell. NA  
 |-----|-----|-----|-----|-----|-----|-----|-----|  
 (never) (2 times/ (4 or more  
 month) times/month)
6. I forgot to return something I borrowed. NA  
 |-----|-----|-----|-----|-----|-----|-----|-----|  
 (never) (2 times/ (4 or more  
 month) times/month)
7. I forgot to pick up items I needed when shopping. NA  
 |-----|-----|-----|-----|-----|-----|-----|-----|  
 (never) (2 times/ (4 or more  
 week) times/week)
8. I forgot to meet a friend on time. NA  
 |-----|-----|-----|-----|-----|-----|-----|-----|  
 (never) (2 times/ (4 or more  
 week) times/week)
9. I forgot to pass on a message to someone. NA  
 |-----|-----|-----|-----|-----|-----|-----|-----|  
 (never) (2 times/ (4 or more  
 week) times/week)
10. I forgot to run an errand I meant to do. NA  
 |-----|-----|-----|-----|-----|-----|-----|-----|  
 (never) (3 times/ (6 or more  
 week) times/week)
11. I forgot to return a phone call. NA  
 |-----|-----|-----|-----|-----|-----|-----|-----|  
 (never) (2 times/ (4 or more  
 week) times/week)

12. I forgot to make an appointment I needed to make (e.g., doctor or dentist).  
 |-----|-----|-----|-----|-----|-----|-----|-----| NA  
 (never) (2 times/ (4 or more  
 month) times/month)
13. I forgot to write an important letter.  
 |-----|-----|-----|-----|-----|-----|-----|-----| NA  
 (never) (2 times/ (4 or more  
 month) times/month)
14. I forgot to return books to the library by the due date.  
 |-----|-----|-----|-----|-----|-----|-----|-----| NA  
 (never) (2 times/ (4 or more  
 month) times/month)
15. I forgot to tip when I finished dinner at a restaurant.  
 |-----|-----|-----|-----|-----|-----|-----|-----| NA  
 (never) (2 times/ (4 or more  
 month) times/month)
16. I forgot to turn my alarm clock off when I got up in the morning.  
 |-----|-----|-----|-----|-----|-----|-----|-----| NA  
 (never) (2 times/ (4 or more  
 week) times/week)
17. I forgot to lock the door when leaving my apartment or house.  
 |-----|-----|-----|-----|-----|-----|-----|-----| NA  
 (never) (2 times/ (4 or more  
 month) times/month)
18. I forgot to take my keys out of my car before locking the doors.  
 |-----|-----|-----|-----|-----|-----|-----|-----| NA  
 (never) (2 times/ (4 or more  
 month) times/month)
19. I forgot to button or zip some part of my clothing as I was dressing.  
 |-----|-----|-----|-----|-----|-----|-----|-----| NA  
 (never) (2 times/ (4 or more  
 week) times/week)
20. I forgot to pay the bill when finishing a meal at a restaurant.  
 |-----|-----|-----|-----|-----|-----|-----|-----| NA  
 (never) (2 times/ (4 or more  
 month) times/month)

21. I forgot to put a stamp on a letter before mailing it. NA  
 |-----|-----|-----|-----|-----|-----|-----|-----|  
 (never) (2 times/ (4 or more  
 month) times/month)
22. I forgot to comb my hair in the morning. NA  
 |-----|-----|-----|-----|-----|-----|-----|-----|  
 (never) (2 times/ (4 or more  
 week) times/week)
23. I forgot to put on deodorant after showering or bathing. NA  
 |-----|-----|-----|-----|-----|-----|-----|-----|  
 (never) (2 times/ (4 or more  
 week) times/week)
24. I forgot to flush the toilet. NA  
 |-----|-----|-----|-----|-----|-----|-----|-----|  
 (never) (2 times/ (4 or more  
 week) times/week)
25. I forgot to get the groceries out of the car when I got home from the grocery store. NA  
 |-----|-----|-----|-----|-----|-----|-----|-----|  
 (never) (2 times/ (4 or more  
 month) times/month)
26. I forgot to lock up my house, bike, or car. NA  
 |-----|-----|-----|-----|-----|-----|-----|-----|  
 (never) (2 times/ (4 or more  
 week) times/week)
27. I forgot to shower or bathe. NA  
 |-----|-----|-----|-----|-----|-----|-----|-----|  
 (never) (2 times/ (4 or more  
 week) times/week)
28. I forgot to cash or deposit my paycheck before my account ran out of money. NA  
 |-----|-----|-----|-----|-----|-----|-----|-----|  
 (never) (2 times/ (4 or more  
 month) times/month)
29. I forgot what I wanted to say in the middle of a sentence. NA  
 |-----|-----|-----|-----|-----|-----|-----|-----|  
 (never) (2 times/ (4 or more  
 week) times/week)

30. I forgot to say something important I had in mind at the beginning of a conversation.

|   |                    |                           |
|---|--------------------|---------------------------|
| ----- ----- ----- ----- ----- ----- ----- | NA                 |                           |
| (never)                                   | (2 times/<br>week) | (4 or more<br>times/week) |

31. I forgot what I came into a room to get.

|   |                    |                           |
|---|--------------------|---------------------------|
| ----- ----- ----- ----- ----- ----- ----- | NA                 |                           |
| (never)                                   | (2 times/<br>week) | (4 or more<br>times/week) |

32. I started to do something, and then forgot what it was I wanted to do.

|   |                    |                           |
|---|--------------------|---------------------------|
| ----- ----- ----- ----- ----- ----- ----- | NA                 |                           |
| (never)                                   | (2 times/<br>week) | (4 or more<br>times/week) |

33. I forgot to bring something I meant to take with me when leaving the house.

|   |                     |                            |
|---|---------------------|----------------------------|
| ----- ----- ----- ----- ----- ----- ----- | NA                  |                            |
| (never)                                   | (2 times/<br>month) | (4 or more<br>times/month) |

34. I got part way through a chore and forgot to finish it.

|   |                    |                           |
|---|--------------------|---------------------------|
| ----- ----- ----- ----- ----- ----- ----- | NA                 |                           |
| (never)                                   | (2 times/<br>week) | (4 or more<br>times/week) |

35. I was driving and temporarily forgot where I was going.

|   |                     |                            |
|---|---------------------|----------------------------|
| ----- ----- ----- ----- ----- ----- ----- | NA                  |                            |
| (never)                                   | (2 times/<br>month) | (4 or more<br>times/month) |

36. I dialed someone on the phone and forgot who I had called by the time they answered.

|   |                     |                            |
|---|---------------------|----------------------------|
| ----- ----- ----- ----- ----- ----- ----- | NA                  |                            |
| (never)                                   | (2 times/<br>month) | (4 or more<br>times/month) |

37. I started writing a note or letter and forgot what I wanted to say.

|   |                     |                            |
|---|---------------------|----------------------------|
| ----- ----- ----- ----- ----- ----- ----- | NA                  |                            |
| (never)                                   | (2 times/<br>month) | (4 or more<br>times/month) |

38. I started to write a check and forgot to whom it was to be paid.

|   |                     |                            |
|---|---------------------|----------------------------|
| ----- ----- ----- ----- ----- ----- ----- | NA                  |                            |
| (never)                                   | (2 times/<br>month) | (4 or more<br>times/month) |

39. I make lists of things I need to do. NA  
 |-----|-----|-----|-----|-----|-----|-----|-----|  
 (never) (2 times/ (4 or more  
 week) times/week)
40. I write myself reminder notes. NA  
 |-----|-----|-----|-----|-----|-----|-----|-----|  
 (never) (2 times/ (4 or more  
 week) times/week)
41. I make a grocery list whenever I go shopping for food. NA  
 |-----|-----|-----|-----|-----|-----|-----|-----|  
 (never) (2 times/ (4 or more  
 week) times/week)
42. I plan my daily schedule in advance so I will not forget things. NA  
 |-----|-----|-----|-----|-----|-----|-----|-----|  
 (never) (2 times/ (4 or more  
 week) times/week)
43. I repeat things I need to do several times to myself in order to remember. NA  
 |-----|-----|-----|-----|-----|-----|-----|-----|  
 (never) (2 times/ (4 or more  
 week) times/week)
44. I use external reminders like tying a string around my finger to help me remember to do things. NA  
 |-----|-----|-----|-----|-----|-----|-----|-----|  
 (never) (2 times/ (4 or more  
 week) times/week)
45. I rehearse things in my mind so I will not forget to do them. NA  
 |-----|-----|-----|-----|-----|-----|-----|-----|  
 (never) (2 times/ (4 or more  
 week) times/week)
46. I lay things I need to take with me by the door so I will not forget them. NA  
 |-----|-----|-----|-----|-----|-----|-----|-----|  
 (never) (2 times/ (4 or more  
 week) times/week)
47. I make Post-It (sticky notes) reminders and place them in obvious places. NA  
 |-----|-----|-----|-----|-----|-----|-----|-----|  
 (never) (2 times/ (4 or more  
 week) times/week)



48. I create mental pictures to help me remember to do something.  
|-----|-----|-----|-----|-----|-----|-----|-----| NA  
(never) (2 times/ (4 or more  
 week) times/week)

49. I put things in piles so I know which ones to do first and which can wait.  
|-----|-----|-----|-----|-----|-----|-----|-----| NA  
(never) (2 times/ (4 or more  
 week) times/week)

50. I lay in bed at night and think of things I need to do the next day so I won't forget to do them.  
|-----|-----|-----|-----|-----|-----|-----|-----| NA  
(never) (2 times/ (4 or more  
 week) times/week)

51. I try to do things at a regular time so I will remember to do them.  
|-----|-----|-----|-----|-----|-----|-----|-----| NA  
(never) (2 times/ (4 or more  
 week) times/week)

52. I keep an appointment book updated in order to remember to do things.  
|-----|-----|-----|-----|-----|-----|-----|-----| NA  
(never) (2 times/ (4 or more  
 week) times/week)

## Curriculum Vita

Brenda Hanson was born in Norfolk, NE. She graduated high school from Luther Preparatory School in Watertown, WI in the spring of 1998 and entered Minnesota State University, Mankato with an academic scholarship. While pursuing her bachelor's degree in Psychology and minor in Biology, Brenda became a member of Psi Chi (Psychology's National Honors Society). In addition, Brenda was the recipient of a Junior Scholars Program Award with which she began her research career. Upon completion of her bachelors in Spring 2002, Brenda was admitted into the Clinical Psychology masters program Fall 2002 at the same institution. During this time she primarily conducted research on anxiety disorders. She was admitted to the Health Psychology doctoral program at the University of Texas, El Paso in Fall 2004. Her primary research interests are in health and addictive behaviors (e.g., smoking, drinking, and club drug use) among minorities. Brenda's dissertation "The Affective, Behavioral, and Cognitive Correlates of Club Drug Use among Hispanic College Students" was the recipient of an NIMH M-RISP Research Development Award. During her time at UTEP, Brenda has presented two papers and eight posters at four different national conferences (i.e., Association for Behavioral and Cognitive Therapies, Society for Behavioral Medicine, Society for Personality and Social Psychology, Society for Public Health Education). She has also published in two peer reviewed journals (i.e., *Clinical Case Studies*, *International Journal of Drug Policy*). Upon completion of her Ph.D., Brenda will be seeking either a postdoctoral fellowship or an independent position in an applied research setting.

Permanent address: 616 Bristol Dr  
El Paso, Texas 79912

This thesis/dissertation was typed by Brenda Sue Hanson.