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Correlates of Marijuana Use in a Hispanic College Sample

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CORRELATES OF MARIJUANA USE IN A HISPANIC COLLEGE SAMPLE

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Dedication

I dedicate this thesis to my uncle, Paul Negrete, who passed away last year. We all miss you, and the world is left without one of the most caring thoughtful men who spread so much joy to others.

CORRELATES OF MARIJUANA USE IN A HISPANIC COLLEGE SAMPLE

by

JOSEPH EPHRAIM CHARTER, B.S.

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Abstract

Currently there is a dearth of literature regarding marijuana and its correlates of use, particularly in Hispanics. Marijuana is the most widely used illicit drug, and its use has increased in recent years. This study aimed to assess correlates of marijuana use in a Hispanic college student sample. Data were collected from 549 participants from University psychology courses.

Participants completed a comprehensive survey packet consisting of: demographics, marijuana use history, tobacco and alcohol use, depression, anxiety, stress, and acculturation. Descriptive analyses were used to provide a characteristic profile of Hispanic college student marijuana use.

Eight percent reported past 30-day marijuana use, while 33.5% reported lifetime use of marijuana. Hierarchical logistic and multiple regression analyses were used to assess correlates of marijuana use. Dependent variables included ever use of marijuana in the past 30 days and frequency of marijuana use in past 30 days. Independent variables included: alcohol use, tobacco use, depression, anxiety, stress, acculturation, and the interaction of acculturation and stress.

Inferential findings suggest men ($B = -1.476$, $OR = .196$, $p < .001$, 95% CI [.113, .463]), greater days of cigarettes smoked ($B = .048$, $OR = 1.049$, $p = .02$, 95% CI [1.008, 1.092]), and greater number of drinks consumed in the past 30 days ($B = .013$, $OR = 1.013$, $p = .001$, 95% CI [1.005, 1.020]) were associated with a heightened likelihood of using marijuana in past 30 days.

Additionally, greater frequency of use of marijuana was associated with greater frequency of cigarette use ($\beta = .105$, $p = .014$). There was no association between marijuana use and depression, anxiety, stress, and acculturation. Implications include the need for future prevention and intervention efforts with particular focus on polysubstance use.

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Chapter 1: Introduction

1.1 Marijuana Use

Marijuana is the most commonly used illicit drug in the United States, and rates of use have increased within the past 10 years (Substance Abuse and Mental Health Services Administration [SAMHSA], 2010). In 2010, approximately 17.4% of the population reported using marijuana in the past 30 days (SAMHSA, 2011). In the general population, marijuana use has been associated with multiple negative consequences. For example, after recent marijuana use, the risk of traffic accidents increases (Ramaekers, Berghaus, van Laar, & Drummer, 2004), regional cerebral blood flow is reduced in posterior visual areas of the brain (O'Leary et al., 2007), and decreased neural activity has been observed in visuospatial working memory (Smith, Longo, Fried, Hogan, & Cameron, 2010). Additionally, smoking marijuana is associated with other risky behaviors such as cigarette smoking, heavy episodic drinking, and using other illicit drugs (DiNitto & Choi, 2011; Mohler-Kuo, Lee, & Wechsler, 2003).

1.2 Hispanics and Marijuana Use

In the U.S., over 48 million people self-identify as Hispanic or of Hispanic origin (U.S. Census Bureau, 2010), and 82.2% of the El Paso population is of Hispanic or Latino origin (U.S. Census Bureau, 2010). Both Mexican immigrants to the U.S. and Mexican Americans (living in the U.S.) are at higher risk of developing substance use disorders than Mexicans who live in México (Borges et al., 2011). In Hispanics, past 30 day drug use has significantly increased from 2008 to 2010 (SAMHSA, 2011). Although a smaller percentage of Hispanic/Latinos have been found to use illicit drugs compared to non-Hispanic whites or blacks, 11.8% of Hispanic adolescents aged 12 to 17 reported using marijuana in the past year (Wu, Woody, Yang, Pan, & Blazer, 2011), and 50% of Hispanic college students reported using marijuana in their lifetime (Cooper, Rodriguez, Charter, & Blow, 2011). Consequently, these use rates warrant a further understanding of marijuana use in Hispanic college students.

1.3 Gender Differences

Greater numbers of males have been found to use illicit drugs in the U.S. compared to females (Johnston, O'Malley, Bachman, & Schulenberg, 2011). Similarly, marijuana use for all ages has been found to be greater for males than females (SAMHSA, 2011). Furthermore, in college students, males' daily marijuana use is greater than double that of females (6.7% v. 2.8% respectively; Johnston et al., 2011). As such, gender differences related to marijuana use represents an important covariate to consider in use and correlate studies.

1.4 Marijuana Use and College Students

Almost 50% of college students (notably similar to Hispanic college students; Cooper et al., 2011) have reported ever using marijuana in their lifetime (Mohler-Kuo et al., 2003). Additionally, 30% of college aged young adults (18-25 years old) reported smoking marijuana within the past year; from 2008 to 2010 the rates of past 30 day use of marijuana increased from 16.5% to 18.5% for college aged young adults (SAMHSA, 2011). Furthermore one in ten college students reported using marijuana at least once a week (Buckner, Ecker, & Cohen, 2010). This is significant to note since research has suggested that the risk of developing marijuana dependence significantly increases in persons who use marijuana more than once a week (Coeffey et al., 2002). Recent high school graduates are at greater risk for more marijuana use and demonstrate marijuana related problems (e.g., missing school or work, increasing tolerance) compared to individuals who have not yet graduated (White, Labouvie, & Papadaratsakis, 2005). Consequently, the increase in prevalence rates of marijuana use (including monthly use) and heightened use in high school graduates suggest the need for empirically and theoretically derived assessment and intervention efforts.

Examining the negative consequences associated with marijuana use in the college student population is an important first step to highlight the need to explore factors that contribute to its use. In a study that examined differences between heavy and light marijuana use within college students, heavy marijuana smokers (smoked daily for at least two years) reported having greater impairment in memory, concentration, and lower motivation, compared to infrequent marijuana users (never smoked 10 times within one month; Kouri, Pope, Yurgelun-

Todd, & Gruber, 1995). Other consequences associated with marijuana use include unsafe sex behaviors in college students (Bell, Wechsler, & Johnston, 1997). To illustrate, a recent study examined the association between marijuana use and sexual risk in college women aged 18-24 (Anderson & Stein, 2011). The authors recruited 308 sexually active females who used marijuana at least once within the past 90 days. The Logit model findings indicated that on days when marijuana was used, there was a 1.6 times greater likelihood of having unprotected sex (Anderson & Stein, 2011). Recent studies have indicated a negative association between grade point average (GPA), and marijuana use (e.g., Buckner et al., 2010). For example, Bates, Accordino, and Hewes (2010) examined predictors of marijuana use in a college student population. The authors found that GPA was a significant predictor of past 30 day marijuana use, such that lower GPA was associated with greater marijuana use. In general, college students overestimate how much their peers use marijuana; more specifically, marijuana users overestimate the social norm of using marijuana compared to their non-marijuana using counterparts (Neighbors, Geisner, & Lee, 2008). Furthermore, college students who have abstained from using marijuana perceive a higher risk from using marijuana than current marijuana users (Kilmer, Hunt, Lee, & Neighbors, 2007). The authors suggest that the perceived risk that abstainers report may act as a protective factor against future use. Therefore understanding the consequences and correlates of marijuana use may be used toward increased psycho education and services that aim to reduce and / or prevent college student marijuana use.

1.5 Comorbid Substance Use

Marijuana use has been found to be associated with increased use of licit and illicit substances (Kouri, et al., 1995). For example, in a study with college students who were referred from a counseling center, relationships were found between marijuana use and misuse of other substances (prescription and other illicit drugs; Lewis & Mobley, 2010). These finding suggest that college students who use marijuana are at greater risk for polysubstance use. Furthermore, marijuana use is closely linked to tobacco and alcohol use, particularly among college students (Buckner et al., 2010). In a study that examined differences between college student users of

marijuana and alcohol, 99% of students who reported using marijuana also endorsed the use of alcohol (Simons, Gaher, Correia, Hansen & Christopher, 2005); however, the inverse relationship was not found. Finally, Simons et al. (2005) indicated that marijuana use increases the risk of alcohol use disorders in college students. The repeated findings of comorbid marijuana and licit and other illicit drug use suggest the assessment of tobacco and alcohol use and empirically derived correlates seems warranted.

1.6 Mental Health Problems

In college students, frequent marijuana use has been associated with greater depression (Dumas et al., 2002) and anxiety (more specifically social anxiety; Buckner, Bonn-Miller, Zvolensky, & Schmidt, 2007) among other mental health problems. Bates and colleagues (2010) conducted a factor analysis for marijuana use motives and found that factor loadings for Personal/Physical Enhancement were significantly grouped together. Items that were grouped in this factor included, “need to relax,” “improve sleep,” “decrease worrying about personal problems,” and “improve effects of other substances” (Bates et. al., 2010). Buckner et al. (2010) sampled non-marijuana users, infrequent users, and frequent marijuana users in a college student population. The authors examined marijuana related problems, academic problems, as well as mental health problems. Marijuana use was associated with past month mental health symptoms, such that higher levels of depression and anxiety were reported by participants who smoked at least once a month compared to non-users (Buckner et al., 2010). Further, the risk for mental health symptoms in marijuana users was observed regardless if it had been used less than once a week or at least once a week. One study examining adolescent (16-18 year olds) marijuana use indicated that both decreased brain white matter and increased depressive symptoms (and their interaction) were positively associated with marijuana use (Medina, Nagel, Park, McQueeney, & Tapert, 2007). Other research findings indicate that past 30 day marijuana use has been significantly associated with anxiety symptoms in a young adult sample (mean age= 20.75, Johnson, Bonn-Miller, Leyro, & Zvolensky, 2009). However, Kouri and colleagues (1995) found no association between marijuana use and diagnosed axis I disorders for both frequent and

infrequent marijuana users. It may be that mental health symptoms increase but remain at a sub threshold level to be diagnosable. Thus, many factors associated with marijuana use relate to mood, affect, and/or symptoms associated with mood disorders. Investigating the relationship between marijuana use and distress symptoms in Hispanic college students will likely strengthen future tailored prevention and intervention efforts.

1.7 Self-Medication Hypothesis

Not only do mental health symptoms serve as potential correlates of marijuana use from an empirically derived perspective but also a theoretically derived stance as well. The Self-Medication Hypothesis (SMH) is based on the notion that individuals' motives to use drugs are an attempt to suppress distressful affective states (Khantzian, 1989). The SMH as a theory has demonstrated mixed results. For example, in a study that examined different types of drug use with a large sample who were drug free for 3 months, variables such as over controlled hostility, repression, depression, psychomotor acceleration, PTSD, and cynicism were measured by the MMPI to assess the SMH (Suh, Ruffins, Robins, Albanese, & Khantzian, 2008). The authors indicated that alcohol use was related to repression, cocaine was related to high level of desire for elation and restlessness, and heroin was related to high levels of anger (Suh et al., 2008). Results supported the SMH such that alcohol abusers use repression for coping; cocaine users possess the need to experience restlessness, and heroin helps sooth anger (Khantzian, 2003). Another study demonstrated a positive relationship with diagnosed anxiety and substance use disorders and suggests support for the SMH (Robinson, Sareen, Cox, & Bolton, 2011).

Some studies have failed to support or have provided conflicting results with regard to the SMH (Bolton, Robinson, & Sareen, 2009; Hall & Queener, 2007). For example, in one study that assessed the SMH, substance users completed questionnaires related to specific symptoms of different disorders (Hall & Queener, 2007). Results indicated that there were no associations between drug use and symptoms. However, the study assessed drug use as a whole as opposed to different drugs or drug groups. Hall and Queener (2007) further suggest that the small sample size and the treatment seeking individuals participating in the study may have limited findings.

Additionally, conflicting results were found in a study that examined individuals with a mood disorder (Bolton et al., 2009). Participants responded on a variety of questions regarding using drugs or alcohol to relieve symptoms. Results indicated that only 24% of the participants with any mood disorder used illicit drugs, alcohol, or prescription drugs (without a prescription) to relieve symptoms (Bolton et al., 2009).

In addition to mixed findings regarding substance use and the SMH, very few studies have assessed marijuana use in relation to this theory. In one study that examined young adult marijuana users, motives for using marijuana as well as bodily pain experienced in the last month were assessed (Hogan, Gonzalez, Howell, Bonn-Miller, & Zvolensky, 2010). The authors indicated that pain-related anxiety was related to using marijuana as a coping response. Hogan and colleagues (2010) explain that marijuana users who experience high levels of anxiety due to pain (compared to lower levels of anxiety) are more likely to smoke marijuana as a coping mechanism for their emotional experiences. Thus, given both the inconsistent results associated with substance use and the SMH and the dearth of studies assessing marijuana use and the SMH, the inclusion of distress-related symptoms as potential correlates of marijuana use seems both empirically and theoretically warranted.

1.8 Acculturation

Acculturation has been defined as “the process of cultural change that occurs when two or more cultural groups come into contact” (Moyerman & Forman, 1992). Although acculturation as a construct has been criticized by the absence of necessary components such as the acculturative change that an individual undergoes within his/her lifetime like a rapid or slow change in acculturation (Lopez-Class, Castro, & Ramirez, 2011), acculturation has been demonstrated to have a relationship with substance use. Furthermore, multiple studies and a recent review have indicated a positive association between acculturation level and substance use in Hispanics (Epstein, Botvin, & Diaz, 2001; Koneru, Weisman de Mamani, Flynn, & Betancourt, 2007; Myers et al., 2009; Wells, Klap, Koile, & Sherbourne, 2001). For example, in one study conducted in the U.S. / México border population, higher levels of acculturation were

associated with greater illicit drug use (including marijuana use) in college students (Resor & Cooper, 2010). Furthermore, linguistic acculturation (dominant language change) has been associated with marijuana use such that more frequent English speaking was associated with greater marijuana use (Epstein et al., 2001). From an empirical standpoint, assessing acculturation and its relationship to marijuana use in a Hispanic sample seems appropriate.

1.9 Acculturative Stress

Acculturative Stress has been described by multiple authors as the psychological impact or strain to the adaption to a new culture (Gil, Vega, & Dimas, 1994; Rodriguez, Myers, Mira, & Garcia-Hernandez, 2002; Smart & Smart, 1995). It has been established that the more acculturated an individual is, the less acculturative stress he/she will experience (Negy, Schwartz, & Reig-Ferrer, 2009). Further, in a study of Mexican American college students, Crockett and colleagues (2007) found that higher levels of social support and active coping were associated with lower levels of acculturative stress. The authors explain that these factors may have acted as protective factors against acculturative stress. Despite these studies that attempt to elucidate acculturative stress, few studies of drug use (and more specifically marijuana use) and acculturative stress exist. One study linked acculturative stress to an increase in alcohol use (Gil, Wagner, & Vega, 2000), and these authors suggest the relationship may hold with other substance use (Vega, Gil, & Wagner, 1998). Thus, there is a genuine need to assess acculturative stress and marijuana use to further assess whether this theory is informative as it relates to Hispanic college student substance use.

1.10 The Current Study

The current study examined marijuana use behaviors in a Hispanic college sample located on the U.S./México border. Variables of interest are derived both empirically and theoretically. Results from this study contribute to the understanding of correlates that may warrant attention in the development of future prevention and intervention efforts.

1.11 Aims and Hypotheses

Aims of this study included the development of a profile of marijuana use and its associations with polysubstance use, potential self-medication, and acculturation and / or acculturative stress. It was hypothesized that marijuana ever use and frequency of use would be associated with greater tobacco and alcohol use, higher levels of reported depression, anxiety, and stress, higher levels of acculturation, and significant acculturation by stress interaction.

Chapter 2: Methods

2.1 Participants

Participants ($N = 722$) were recruited from The University of Texas at El Paso. Inclusion criteria were participants must be enrolled at UTEP and be fluent in English. Of the 722 participants 608 (84%) self-identified as of Hispanic origin and 59 (9.7%) of the self-identified Hispanics did not complete the survey and were not used in subsequent analysis. The resulting sample size was 549 participants (62.5% female) with an average age of 20.5 ($SD = 4.74$). Participants were recruited through the online program Sona System and were given course credit for their participation.

A power analysis using G-power (Buchner, Erdfelder, Faul, & Lang, 2010) was conducted with an effect size of small to moderate ($f^2 = .085$) entered. A sample of 252 was concluded to provide a power of .95 with 6 predictors (regression with most predictors; gender, depression, anxiety, stress, acculturation and acculturation*stress). Clearly the current sample exceeds the projected sample size.

2.2 Measures

A sociodemographic questionnaire (Appendix A) was delivered to assess gender, age, ethnicity, income, education level (how many years completed of college), current grade point average, size of household, and marital status.

Marijuana Smoking History Questionnaire (MSHQ, Appendix B) is a 21-item instrument that asks about age of initiation, lifetime use, past year use, past 30 day, and daily use of marijuana (Bonn-Miller & Zvolensky, 2009). The MSHQ additionally measures means of typical use (joint, bowl, bong, one-hitter, or ingestion) and social context of using marijuana (number of people typically smoke with). The measure has been used in recent research (Bonn-Miller, Zvolensky, & Johnson, 2010; Johnson, Mullin, Marshall, Bonn-Miller, & Zvolensky, 2010).

A Tobacco use survey (Appendix C) was used to assess smoking status. Smoking status was classified as smoking 11 or more cigarettes per day (cpd); smoking fewer than 11 cpd but greater than 5 cpd; smoking daily but fewer than 5 cpd; smoking daily but less than one a day; smoking weekly but not daily; or smoking monthly but not weekly. Smoking status was additionally assessed by asking how many cigarettes the participant smoked on days smoked, as well as how many days in the last 30 days were smoking days. This measure has been used in previous research (Cooper et al., 2011; Rodríguez-Esquivel, Cooper, Blow, & Resor, 2009).

The Daily Drinking Questionnaire (Appendix D; DDQ) assesses drinking rate and time spent drinking (Collins, Parks, & Marlatt, 1985). Internal reliability of this scale has been found to range between .73 and .78 (Geisner, Larimer, & Neighbors, 2004; Lewis & Neighbors, 2004). Number of drinks per 30 days was found by adding number of drinks consumed in a typical week and multiplying by four for subsequent analyses. This scale demonstrated high internal reliability in this study ($\alpha = .85$)

The Short Acculturation Scale for Hispanics (Appendix E; SASH) assesses level of acculturation to American culture. Items are on a Likert-type scale ranging from one (less acculturated) to five (greater acculturated; Marín, Sabogal, VanOss, Otero-Sabogal, & Pérez-Stable, 1987). The SASH assesses language use, media, and ethnic social relations. The SASH has been found to have high internal reliability ($\alpha = .92$; Marín et al., 1987), and has been used in past studies within the border region population (Cooper et al., 2011; Hu, Taylor, Blow, & Cooper, 2011). Average total score of the SASH is calculated; higher scores indicate higher levels of acculturation. This scale demonstrated high internal reliability for this study ($\alpha = .90$)

The Depression, Anxiety, and Stress Scales (Appendix F; DASS) is a 42 item, self report measure that assesses depressive, anxiety, and stress symptoms (Lovibond & Lovibond, 1995). Each scale of depression, anxiety, and stress are composed of 14 items. Each scale has been found to have high internal consistency (α 's for all scales $> .89$; Crawford & Henry, 2003). Items are rated on a 4 point scale (0-did not apply to me at all; 3- Applied to me very much, or most of the time) indicating rate or severity of symptoms within the past week in which higher scores

indicate higher severity. Each individual scale was summed and averaged to yield scores for depression, anxiety, and stress. Internal reliabilities for the depression, anxiety, and stress subscales in this study had Cronbach's α of .93, .87, and .91 respectively.

2.3 Procedure

UTEP Institutional Review Board approval was obtained prior to study commencement. The measures were administered using a secure on-line survey, Survey Monkey, in which participants completed the consent form and survey measures. After participants electronically signed the informed consent form, the participants were automatically directed to a separate linked survey that included all the measures. All participants included in analyses acknowledged that they have signed and understood the informed consent form to complete the survey and receive credit for completing the survey. Surveys did not have names attached or the ability to link the consent form to the survey to ensure confidentiality. Once the survey was completed, participants were thanked for participation, given course credit, and given information about two resources that may help with any discomfort or distress that they may have experienced. The first resource was the UTEP University Counseling Center at 202 Union West (915-747-5302; Open Monday and Tuesday 8am to 5pm). The second resource was Aliviane Incorporated (915-779-4527; Open Monday-Saturday 6am to 3pm).

2.4 Design

This study was cross sectional in design. The following were dependent variables: use of marijuana in the past 30 days (yes/no) and frequency of marijuana use in the past 30 days. The following independent variables were used: tobacco use, alcohol use, depression, anxiety, stress, acculturation, and the interaction between acculturation and stress.

2.5 Approach to Analyses

Descriptive analyses were used to provide a characteristic profile of Hispanic college student marijuana use. Univariate relationships were assessed through correlations and *t*-tests (see Table 1).

Four hierarchical regressions were conducted. In the first logistic regression model, polysubstance use was assessed; use of marijuana in past 30 days was the dependent variable (“No” is the referent group); past 30 day use of alcohol (number of drinks) and tobacco (number of days) were the independent variables (gender was controlled for). In the second model, a hierarchical linear regression, frequency of marijuana use in the past thirty days was the dependent variable, and past 30 day use of tobacco and alcohol were the independent variables; gender was controlled for in step 1. The third model was a hierarchical logistic regression with ever past use of marijuana (“No” is the referent group) as the dependent variable and independent variables of gender (step 1); depression, anxiety, and stress (step 2); and acculturation and the acculturation by stress interaction (step 3). The fourth regression was a hierarchical linear regression with frequency of past 30 day use as the dependent variable and the same independent variables from model 3 entered in the same order as mentioned above.

Chapter 3: Results

Participant characteristics are displayed in Table 3.1. Lifetime use of marijuana was reported by 184 participants (33.5%). Use of marijuana in the past 30 days was reported by 44 participants (8%). Univariate tests indicated a difference between ever use of marijuana in the past 30 days and gender ($\chi^2 = 25.28$, $df = 1$, $p < .001$), drinks per month ($t(547) = -5.20$, $p < .001$), and number of days smoked tobacco in the past 30 days ($t(547) = -4.41$, $p < .001$). Monthly alcohol and tobacco use were significantly greater in marijuana users relative to non-marijuana users (See Table 3.1).

Table 3.1: Participant characteristics and univariate differences between marijuana users and nonusers.

| Variable | All Participants (n=549) | Past 30 day marijuana users (n=44) | Past 30 day non- marijuana users (n=505) | P-value |
|---|-----------------------------|--|--|---------|
| Age | | | | .781 |
| <i>M</i> | 20.5 | 20.3 | 20.5 | |
| <i>SD</i> | 4.74 | 3.24 | 4.7 | |
| Gender | | | | <.001 |
| % Female | 62.5 | 3.5 | 96.5 | |
| % Male | 37.5 | 15.53 | 84.47 | |
| GPA (n=372)* | | | | .664 |
| <i>M</i> | 2.99 | 2.93 | 3.0 | |
| <i>SD</i> | .795 | .873 | .789 | |
| # of days smoked marijuana in past 30 days | | | | |
| <i>M</i> | .7559 | 11.03 | NA | |
| <i>SD</i> | 4.0 | 11.33 | | |
| Drinks per month | | | | <.001 |
| <i>M</i> | 21.89 | 45.73 | 19.81 | |
| <i>SD</i> | 32.44 | 37.84 | 31.12 | |
| Days smoked tobacco (past 30 days) | | | | <.001 |
| <i>M</i> | 1.26 | 4.55 | .974 | |
| <i>SD</i> | 5.17 | 9.65 | 4.48 | |
| Depression (score 0-42) | | | | .791 |
| <i>M</i> | 4.71 | 4.46 | 4.73 | |
| <i>SD</i> | 6.68 | 5.61 | 6.77 | |
| Anxiety (score 0-42) | | | | .721 |
| <i>M</i> | 4.36 | 4.07 | 4.39 | |
| <i>SD</i> | 5.46 | 4.29 | 5.56 | |
| Stress (score 0-42) | | | | .332 |
| <i>M</i> | 7.91 | 6.86 | 8.00 | |
| <i>SD</i> | 7.44 | 6.11 | 7.54 | |
| SASH (acculturation, score 1-5) | | | | .084 |
| <i>M</i> | 3.22 | 3.40 | 3.20 | |
| <i>SD</i> | .73 | .68 | .733 | |
| SASH*Stress | | | | .456 |
| <i>M</i> | 25.97 | 23.11 | 26.21 | |
| <i>SD</i> | 26.42 | 21.82 | 26.79 | |

*Not all participants have a current GPA.

In the first logistic regression model with use of marijuana in the past 30 days (yes/no) serving as the dependent variable and gender, amount of drinks consumed in the past 30 days (quantity), and amount of days smoked tobacco in the past 30 days as the independent variables, the first step of the overall model was significant ($\chi^2 = 24.51$, $df = 1$, $p < .001$). In step 1, gender

was a statistically significant predictor ($B = -1.624$, $OR = .197$, $p < .001$, 95% CI [.099, .392]) with females being .19 times as likely to have smoked marijuana in the past 30 days as males. In step 2, the overall model was significant ($\chi^2 = 43.332$, $df = 3$, $p < .001$) with gender ($B = -1.476$, $OR = .228$, $p < .001$, 95% CI [.113, .463]), number of drinks per month ($B = .013$, $OR = 1.013$, $p = .001$, 95% CI [1.005, 1.020]), and number of days smoked per month ($B = .048$, $OR = 1.049$, $p = .02$, 95% CI [1.008, 1.092]) statistically significant predictors of ever use of marijuana in the past 30 days. For each unit increase in number of alcohol drinks, participants were 1.01 times more likely to have smoked marijuana in the past 30 days, and for each unit increase in days smoked, participants were 1.04 times more likely to have smoked marijuana in the past 30 days (See Table 3.2).

Table 3.2: Logistic regression model- predicting smoking marijuana in the past 30 days ($N=549$).

| Variables | B | Odds ratio | 95% confidence intervals | | <i>P</i> |
|-----------------------------|--------|------------|--------------------------|-------|----------|
| | | | Lower | Upper | |
| Step 1 | | | | | |
| Gender | -1.624 | .197 | .099 | .392 | <.001 |
| Constant | -1.693 | | | | |
| Step 2 | | | | | |
| Gender | -1.476 | .228 | .113 | .463 | <.001 |
| Drinks in past 30 days | .013 | 1.013 | 1.005 | 1.020 | .001 |
| Days smoked in past 30 days | .048 | 1.049 | 1.008 | 1.092 | .02 |
| Constant | -2.258 | | | | <.001 |

Note: Step 1 $\chi^2 (1) = 24.51$, $p < .001$, Nagelkerke $R^2 = .102$
Step 2 $\chi^2 (2) = 18.822$, $p < .001$, Nagelkerke $R^2 = .117$

In the second regression model (linear), the first step of the overall model was significant accounting for 4.2% of the variance in number of days smoked marijuana in the past 30 days. In the first step gender was statistically significant ($\beta = .204$, $p < .001$). In step 2, the overall model was significant, accounting for 6.1% of the variance in days smoked marijuana; incremental variance in this step was also significant, uniquely accounting for an additional 1.9% of the variance in days smoked marijuana. Number of days smoked cigarettes in the past 30 days was

statistically significantly associated with frequency of marijuana use ($\beta = .105$, $p = .014$) (See Table 3.3).

Table 3.3: Linear regression predicting frequency of past 30 day marijuana use ($N=548$)

| Variables | <i>B</i> | <i>SE B</i> | β | 95% confidence intervals | | <i>P</i> |
|--|----------|-------------|---------|--------------------------|-------|----------|
| | | | | Lower | Upper | |
| Step 1 | | | | | | |
| Constant | -1.309 | .522 | | | | |
| Gender | 1.749 | .358 | .204 | 1.045 | 2.453 | <.001 |
| Step 2 | | | | | | |
| Constant | -1.353 | .520 | | | | |
| Gender | 1.559 | .360 | .182 | .851 | 2.267 | <.001 |
| Drinks in past 30 days | .009 | .006 | .071 | -.002 | .020 | .10 |
| Days smoked in past 30 days | .084 | .034 | .105 | .017 | .152 | .014 |
| Note: Step 1 $R^2 = .42, p<.001$ Step 2 $R^2 = .061; \Delta R^2 = .019, p = .004$ | | | | | | |

In the third regression model (logistic), with ever use of marijuana in the past 30 days serving as the dependent variable and gender, depression, anxiety, and stress scores, acculturation, and the interaction of acculturation and stress as the independent variables, the first step of the overall model was significant ($\chi^2 = 24.51$, $df = 1$, $p < .001$). In step 1, gender was a statistically significant predictor ($B = -1.624$, $OR = .197$, $p < .001$, 95% CI [.099, .392]) with females being .19 times as likely to have smoked marijuana in the past 30 days relative to males. Steps 2 and 3 of the model were not statistically significant (See Table 3.4).

Table 3.4: Logistic regression model- predicting smoking marijuana in the past 30 days ($N=549$).

| Variables | B | Odds ratio | 95% confidence intervals | | <i>P</i> |
|-------------|--------|------------|--------------------------|-------|----------|
| | | | Lower | Upper | |
| Step 1 | | | | | |
| Gender | -1.624 | .197 | .099 | .392 | <.001 |
| Constant | -1.693 | .184 | | | <.001 |
| Step 2 | | | | | |
| Gender | -1.611 | .20 | .100 | .40 | <.001 |
| Depression | .005 | 1.005 | .932 | 1.083 | .903 |
| Anxiety | .000 | 1.00 | .903 | 1.107 | .997 |
| Stress | -.002 | .978 | .907 | 1.055 | .570 |
| Constant | -1.558 | .211 | | | <.001 |
| Step 3 | | | | | |
| Gender | -1.553 | .212 | .15 | .425 | <.001 |
| Depression | .004 | 1.004 | .932 | 1.082 | .909 |
| Anxiety | .009 | 1.009 | .911 | 1.118 | .861 |
| Stress | .061 | 1.062 | .853 | 1.352 | .623 |
| SASH | .490 | 1.633 | .846 | 3.152 | .144 |
| SASH*Stress | -.026 | .974 | .911 | 1.042 | .444 |
| Constant | -3.208 | | | | .006 |

Note: Step 1 $\chi^2(1) = 24.51, p < .001$, Nagelkerke $R^2 = .102$

Step 2 $\chi^2(3) = .682, p = .887$, Nagelkerke $R^2 = .105$

Step 3 $\chi^2(2) = 2.376, p = .305$, Nagelkerke $R^2 = .114$

In the fourth regression model (linear), the first step of the overall model was significant accounting for 4.2% of the variance in number of days smoked marijuana with gender being statistically significant ($\beta = .204, p < .001$). Step 2 of the model was not significant. Step 3 of the overall model was significant accounting for 5.8% of the variance ($p = .049$); however, none of the individual predictors entered were statistically significant (See Table 3.5).

Table 3.5: Linear regression predicting frequency of past 30 day marijuana use ($N=548$)

| Variables | <i>B</i> | <i>SE B</i> | β | 95% confidence intervals | | <i>P</i> |
|-------------|----------|-------------|---------|--------------------------|-------|----------|
| | | | | Lower | Upper | |
| Step 1 | | | | | | |
| Constant | -1.309 | .522 | | | | |
| Gender | 1.749 | .358 | .204 | 1.045 | 2.453 | <.001 |
| Step 2 | | | | | | |
| Constant | -1.061 | .566 | | | | |
| Gender | 1.728 | .361 | .202 | 1.018 | 2.438 | <.001 |
| Depression | -.040 | .040 | -.064 | -.118 | .038 | .316 |
| Anxiety | .054 | .051 | .071 | -.047 | .155 | .296 |
| Stress | -.034 | .039 | -.060 | -.110 | .043 | .388 |
| Step 3 | | | | | | |
| Constant | -2.99 | 1.202 | | | | |
| Gender | 1.613 | .363 | .188 | .90 | 2.326 | <.001 |
| Depression | -.037 | .04 | -.06 | -.116 | .041 | .347 |
| Anxiety | .069 | .052 | .091 | -.032 | .171 | .180 |
| Stress | -.02 | .118 | -.036 | -.252 | .212 | .867 |
| SASH | .662 | .348 | .116 | -.021 | 1.345 | .058 |
| SASH*Stress | -.009 | .033 | -.057 | -.073 | .055 | .785 |

Note: Step 1 $R^2 = .042$, $p < .001$
Step 2 $R^2 = .047$; $\Delta R^2 = .006$, $p = .368$
Step 3 $R^2 = .058$; $\Delta R^2 = .011$, $p = .049$

Chapter 4: Discussion

The current study found low rates of both lifetime (33.5%) and past 30 day (8%) marijuana use in Hispanic college students. These rates are inconsistent with both the general population and with studies of marijuana use in Hispanics. For example, recent findings suggest that 51.9% of 18 to 25 year olds have used marijuana in their lifetime, and 19% of 18 to 25 year olds have used marijuana in the past month (SAMHSA, 2012). Within Hispanics aged 18 to 25, 45.8% reported using marijuana in their lifetime, and 16.6% reported using marijuana in the past month (SAMHSA, 2012). Within college students 46.6% report using marijuana in their lifetime, and 19.4% reported using marijuana in the past 30 days (Johnston, O'Malley, Bachman, & Schulenberg, 2012). Furthermore, border region studies have observed similarly higher marijuana use rates (Cooper et al., 2011; Resor & Cooper, 2010).

The discrepancies between the current study and previous findings are noteworthy. First, it may be that there is social desirability reflected within this sample such that participants may not be accurately reporting their illicit substance use. For example, higher reported social desirability has been found to be associated with lower reported addiction to alcohol and drugs (Zemore, 2012). Future studies should include a measure of social desirability to assess the accuracy of participant responses to sensitive substance use questions. Second, this sample may have unique characteristics compared to other college student samples. Notably, data collection was initiated during the summer, and students enrolled in summer courses may be qualitatively different from students who only enroll in regular semesters (Fall/Spring). For example, students enrolled in the summer may have greater motivation toward their studies and thus may have lower illicit substance use rates compared to their school year only counterparts. Third, it may be that illegal substance use rates in the border region have declined compared to what previous

studies have reported (e.g., Cooper et al., 2011; Resor, & Cooper, 2010), suggesting that prevention and intervention strategies may have been effective in reducing marijuana use rates in the Hispanic college student population. Future longitudinal studies are warranted in order to assess marijuana use rates and patterns over time.

4.1 Demographic Characteristics and Polysubstance Use

4.1.1 Gender

Consistent with the literature in other ethno-cultural samples, as well as in Hispanic groups (Cooper et al., 2011; SAMHSA, 2012), men reported higher marijuana use rates than women (both frequency and ever use in past 30 days). Although the rates of marijuana use were low overall, significant differences between the genders were still observed. Future studies assessing gender differences, particularly in Hispanic college students within the U.S./México border region seem warranted. For example, the assessment of adherence to traditional gender roles with Hispanic college students may enhance the understanding of different use rates and patterns. Future prevention and intervention efforts may benefit from components that address both genders yet strongly appeal to men.

4.1.2 Tobacco Use.

Consistent with hypotheses, cigarette smoking was associated with both ever use and frequency of use of marijuana in the past 30 days. This association of dual smoking has been observed in previous studies (Buckner et al., 2010; Reed, Wang, Shillington, Clapp, & Lange, 2007; Richter et al., 2004; Zeiger et al., 2012) and also within the border region (e.g., Cooper et al., 2011). This finding is particularly interesting, given that the current sample were predominantly light and intermittent smokers (smoking in a non-daily fashion or fewer than 10 cigarettes per day) and has multiple implications. It may be that light and intermittent smokers

who also use marijuana have different personality traits that are associated with this particular substance use pattern. For example, one study examining Puerto Ricans and African Americans found that dual users with infrequent tobacco use and late onset of marijuana user (e.g., initiated after age 19) reported significantly greater antisocial behaviors (risk taking and rebellion) compared to non-users of either substance (Brook, Lee, Brown, & Finch, 2012). Second, it may be that marijuana users who smoke cigarettes perceive cessation of either substance as difficult and continue smoking both substances. One study suggested that marijuana and tobacco use perceptions regarding withdrawal were similar in severity, and in this sample of “quitters” of either substance, withdrawal symptoms significantly contributed to relapse (Budney, Vandrey, Hughes, Thostenson, & Bursac, 2008). Future studies should include assessments of substance use cessation, attempts at cessation, and relapse to gain a better understanding of dual use patterns. Finally, it may be that dual marijuana and tobacco users experience a reinforcing effect for their dual use. In fact, qualitative interview and focus group findings suggest that dual users reported cigarette and marijuana smoking to be inextricably linked and noted that although cigarette smoking cessation was desirable, marijuana use cessation was not; thus, marijuana use reinforced continued tobacco use (Amos, Wiltshire, Bostock, Haw, & McNeill, 2004). Future studies should further investigate this relationship of dual use of marijuana and tobacco in light and intermittent Hispanic smokers, perhaps with particular focus on personality traits observed in other dual using populations; cessation attempts, actual cessation, and relapse; and the reinforcing effects of each substance on the other. Future interventions should target the dual smoking of marijuana and tobacco by including components that address both substances.

4.1.3 Alcohol.

Consistent with hypotheses, alcohol use was associated with ever use of marijuana in the past 30 days. This is consistent with studies of college students (Buckner et al., 2010) and Hispanics (Pacek, Malcolm, & Martins, 2012). Alcohol use has been associated with the use of multiple licit and illicit drugs (Bolten et al., 2009; Taylor & Cooper, 2010; Witkewitz et al., 2011). In addition to the studies noting polysubstance use, multiple studies have noted a clear relationship between alcohol use and multiple risky behaviors (Astudillo, Kuntsche, Graham, & Gmel, 2010; Johnston et al., 2011; Parada et al., 2012). It may be that risk taking or sensation seeking contribute to comorbid alcohol and marijuana use; future studies should explore this possibility. Another construct that may need to be addressed with regard to alcohol and marijuana use may be use motives. For example, in a predominantly Hispanic sample (i.e., 85%) of young adults (aged 15-24), individuals had a lesser desire to smoke marijuana when alone, suggesting that marijuana is a substance more commonly used in social situations (Shrier, Walls, Kendall, & Blood, 2012). Regarding alcohol use, social motives have been found to be significant predictors of binge drinking (Chauvin, 2012), and individuals have been observed to alter their drinking behavior based on their social network's opinions (Hunter-Reel, McCrady, Hilderbrandt, & Epstein, 2010). Future studies should examine motives for drinking and using marijuana concurrently in Hispanic college student samples. Thus, the assessments of risk taking, sensation seeking, and use motives with regard to co-morbid alcohol and marijuana use seem warranted. As with tobacco use, prevention and intervention efforts should focus on dual licit and illicit substance use.

4.1.4 Polysubstance Use.

Current polysubstance use findings and the noted dangers associated with comorbid substance use (Malmber et al., 2010) suggest the need for future assessment and intervention

studies to address this multiple use of substances. For example, future studies are needed to examine the temporal relationships of marijuana, alcohol, and tobacco use in Hispanics populations. Such a study would allow for the exploration of the gateway drug hypothesis, which suggests the use of “less harmful” drugs will lead to future use of “more harmful” drugs (Kandel, 1975). Other researchers have also begun to explore the possibility of a reverse gateway hypothesis that suggests more harmful substance use may lead to less harmful substance use (Fielder, Carey, & Carey, 2012). For example, recent research suggested that pre-college hookah use predicted initiating and/or resuming cigarette smoking in college (e.g., supports the gateway hypothesis), and pre-college marijuana use predicted college hookah smoking (e.g., supports the reverse gateway hypothesis; Fielder, et al., 2012). Further, a recent cross-national study examined substance use behaviors and their relationship with age of initiation of the substances (Degenhardt et al., 2010). In the U.S., among people aged 18-29, individuals who used tobacco or alcohol had higher odds of using marijuana and other illicit drugs later in life compared to individuals who did not use tobacco or alcohol. Further, individuals who used marijuana had higher odds (compared to non-marijuana users) of using other illicit drugs, with only 12.6% of individuals using other illicit drugs without first using marijuana (Degenhardt et al., 2010). In this specific U.S. Mexico border region, one study observed that in Hispanic college students club drug use was associated with the use of other illicit drugs (Resor & Cooper, 2010). Understanding the pattern of licit and illicit substance use over time will likely strengthen the prevention and treatment of polysubstance use. For example, targeting alcohol, tobacco, and marijuana use may not only reduce the use of these targets of intervention but may also contribute to reducing the risk of the initiation and potential use of other harmful substances (i.e., cocaine, heroin, bath salts).

4.2 Theoretical Underpinnings

4.2.1 Self-medication/Mental Health Risk Factors.

Inconsistent with past research and the self-medication hypothesis (Buckner et al., 2010; Hogan et al., 2010), there was no association observed between depression, anxiety, and stress symptoms and marijuana use. Four reasons for this inconsistent finding are noteworthy. First, it may be that distress symptom findings demonstrate a floor effect; particularly given this was not a clinical sample. For example, one study of Hispanic college students that examined depression, anxiety, and stress symptoms using the same measures found slightly higher mean scores for depression and stress symptoms compared to those found in this study (Cabriaes, Cooper, & Taylor, 2012). Thus, assessing distress symptom and marijuana use relationships in students reporting mental health concerns or who may be at risk for mental health diagnoses may yield quite different results. Second, it may be that in this particular sample, students use marijuana more for recreational than for coping purposes. For example, individuals who met criteria for marijuana dependence were more likely to use marijuana for coping reasons compared to those who abuse or use marijuana (Bonn-Miller & Zvolensky, 2009). Current results support use patterns and frequency that are more consistent with use/abuse than dependence. Again, motives for marijuana use seem important to assess. Third yet related, there may be different characteristics between different types of marijuana users (i.e., motive for use and amount of use). For example, differences between frequent, infrequent, and ever use of marijuana have been observed with regard to marijuana related problems (Buckner et al, 2010). Future studies may benefit from operationalizing different types of marijuana users. Fourth, in Hispanic college students, unique protective factors for distress symptoms may be more salient than substance use. One study found that non-Hispanic white participants who had experienced a major

depressive episode were more likely to have a marijuana use disorder, while Hispanics who had experienced a major depressive episode were no more likely to be diagnosed with any substance use disorder (Pacek et al., 2012). Although not assessed in this or the Pacek et al. (2012) study, it may be that other constructs (e.g., familism, ethnic pride), serve as culturally based protective factors for distress symptoms that reduce the reliance on substance use. Future studies examining marijuana use in Hispanic college students may benefit from assessments in clinical settings, assessments of marijuana use motives, operationalizing different types of marijuana users, and assessments of other constructs which may serve as protective factors from distress symptoms.

4.2.2 Acculturation/Acculturative Stress.

Inconsistent with hypotheses and previous research (Epstein et al., 2001; Myers et al., 2009), there was no association observed between marijuana use and acculturation. Multiple explanations can be explored. First, acculturation may have been measured too narrowly, as the scale used emphasizes linguistic acculturation. Other acculturation-related constructs may serve as better risk factor constructs to assess in Hispanic college students. For example, bilingualism has been found to be associated with better self-reported health (Kimbrow, Gorman, & Schachter, 2012), and Mexican immigrants demonstrated lower risk for drug use than Mexicans born in the United States (Borges et. al., 2011). Future studies of marijuana use correlates in Hispanic college students may want to extend their acculturation-based assessments to include bilingualism and immigration / generation in the US status, among others. Second, yet related, it may be that acculturation and its association with substance use is unique in border region cities. For example, individuals, particularly college students living on the border, frequently cross back and forth between cultures, which may blur typical relationships observed between acculturation and substance use. Third, other important constructs not assessed in this study may impact the

relationship between acculturation and marijuana use. One recent study suggested that in middle school students, linguistic acculturation was not associated with alcohol use; however, parental monitoring (how much they believed parents were monitoring their daily behavior) was significantly associated with substance use as was the interaction of acculturation and parental monitoring (Marsiglia, Nagoshi, Parsai, & Castro, 2012). Thus, future studies should include other potential constructs which may significantly impact the relationship between acculturation and marijuana use. Finally, within marketing research, “psychographics” (e.g., activities, interests, and the opinions of the consumer) are often considered as salient, and the same may be observed in health promotion research. For example, one study found that psychographic health orientation (i.e., differences in motivation toward health) significantly predicted exercising behavior (Dutta & Bodie, 2006). Other recent models of psychographic use have explored differences in music interest and clothing to tailor substance use reduction efforts (Jordan, 2012). Future studies of Hispanic college student substance use may benefit from different acculturation measures and constructs (e.g., generation status, frequency of border crossing); the inclusion of constructs which may impact these relationships; and the inclusion of assessments of psychographic rather than solely traditional constructs.

4.3 Clinical Implications.

Multiple clinical implications are notable. First, Hispanic college students may benefit from interventions that are tailored toward males with an increased focus on polysubstance use. For example, alcohol use interventions using motivational interviewing/enhancement have been found to reduce both drinking and marijuana use (Magill, Barnett, Apodaca, Rohsenow, & Monti, 2008). Again, based primarily on polysubstance use findings, another intervention component which should be explored within clinical research is the use of trigger management

which assists the individual in avoiding, escaping, or coping with cues to substance use. Such components have been efficacious in promoting tobacco use cessation and relapse prevention (Ramsay & Hoffman, 2004), and it is likely that alcohol, tobacco, and marijuana use serve as strong cues for each other. Finally, cognitive behavioral therapy with drug counseling has been observed to improve coping skills for substance use disorders (Kiluk, Nich, Babuscio, & Carroll, 2010) and would likely be beneficial for the treatment of comorbid use of alcohol, tobacco, and marijuana. Future prevention and intervention efforts may benefit from targeting men and including motivational enhancement, trigger management, and CBT related components to reduce marijuana use prevalence in Hispanic college students.

4.4 Limitations

Several limitations are noteworthy. First, the present study was cross-sectional in design which limited the assessment of the temporal relationships among different substances, as well as the use of marijuana over time. Second, substance use was assessed via a self-report online survey, and students may have underreported their levels of use. However, online and paper and pencil surveys appear to be consistent with one another (Davidov & Depner, 2011), and online surveys measuring marijuana use have been found to demonstrate good construct validity (Ramo, Liu, & Prochaska, 2011). Third, this was a convenience sample of Hispanic college students enrolled in psychology classes, which potentially limits generalizability to other ethnocultural groups or to non-college young adults.

4.5 Strengths

Multiple strengths of the current study are also noteworthy. First, although the assessment within the present sample may limit generalizability, the sample also serves as a study strength, as Hispanic college students have been understudied within the marijuana use literature. Second,

correlates assessed within the current study were empirically and theoretically derived. Third, the recent legalization of the recreational use of marijuana in two states suggests that a growth in use rates in the future could potentially contribute to an increase in marijuana use disorders, as well as interest in associations with marijuana use. For example individuals who reside in states where medical marijuana use is permitted, are more likely to use, abuse, and be dependent on marijuana compared to those who reside in where all marijuana use is prohibited (Cerdá, Wall, Keyes, Galea, & Hasin, 2011).

4.6 Conclusions and Future Directions

This study examined the relationships between marijuana use and demographics, the use of other licit substances, distress symptoms, and acculturation in border region Hispanic college students. Findings suggest marijuana use is associated with being male and increased smoking and drinking.

Although prevalence rates were relatively low, polysubstance use findings (and dangers) suggest the need for future studies in this area, as well as prevention and intervention efforts. Future studies should likely be prospective in design to assess changes in marijuana use over time, as well as temporal relationships of polysubstance use. Studies should also likely include the assessments of: use motives, other cultural constructs (e.g., adherence to traditional gender roles, generation status), and more novel psychographic constructs. Future prevention and intervention efforts may benefit from appealing to men and using empirically validated treatment components to reduce marijuana use prevalence.

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Appendix A
Demographic Survey

Today's Date: _____

How old are you? _____

Gender: _____ Male _____ Female

How many semesters of College have you completed? (Include semesters completed from other institutions)

_____ Semesters

What is your current grade point average (GPA) at the University level if applicable?

_____ GPA

I am:

_____ Single (never married)

_____ Married

_____ Divorced

_____ Widow/Widower

_____ Separated

_____ Living with someone

Please indicate the ethnic group(s) to which you belong:

_____ Mexican National _____ Mexican American

_____ Other Hispanic/Latin ethnic group (please specify) _____

_____ White _____ African American

_____ Asian American _____ Native American

_____ Other (please specify) _____

What is your total annual household/family income from all sources? (Check one)

☐ Less than \$15,000

☐ Between \$15,000 and \$30,000

☐ Between \$30,000 and \$50,000

☐ More than \$50,000

Appendix B
Marijuana Smoking History Questionnaire (MSHQ)

1. Do you currently or have you ever smoked marijuana?

1 = YES 0 = NO

*If NO, skip the remainder of this page and the next.

2. Please rate your marijuana use in the past 30 days.

0 1 2 3 4 5 6 7 8

No use

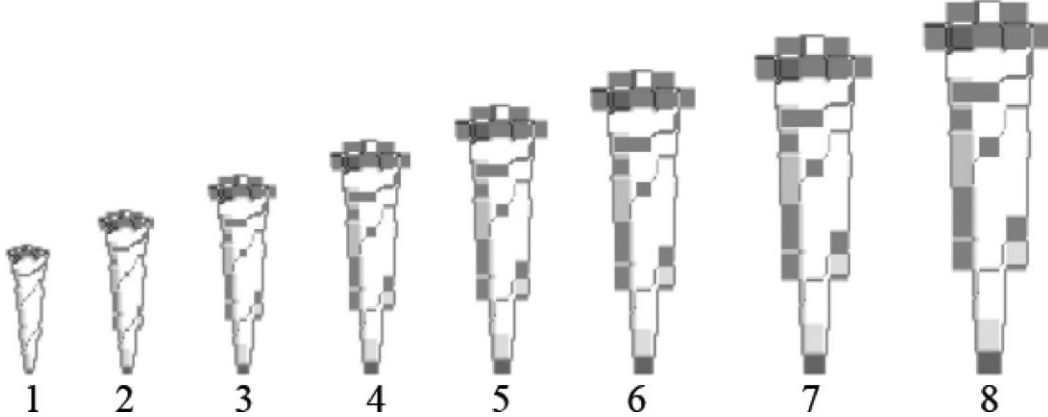
Once a week

More than once a day

3. In the last 30 days, how many **days** have you smoked marijuana?

_____Number of days

4. On average, how much marijuana do you smoke per occasion (circle one)?



5. In your lifetime how many days have you smoked marijuana?

0 1 2 3 4 5 6

No days

More than 300 days

6. What is the **typical** means by which you consume marijuana (circle one)

a. Joint b. Bowl c. Bong d. One-hitter e. Ingestion (e.g. food)

7. In which of the following situations do you **typically** smoke marijuana (circle one)

a. Alone b. With two or three people c. With more than three people

8. How old were you when you **first** smoked marijuana?

_____(years)

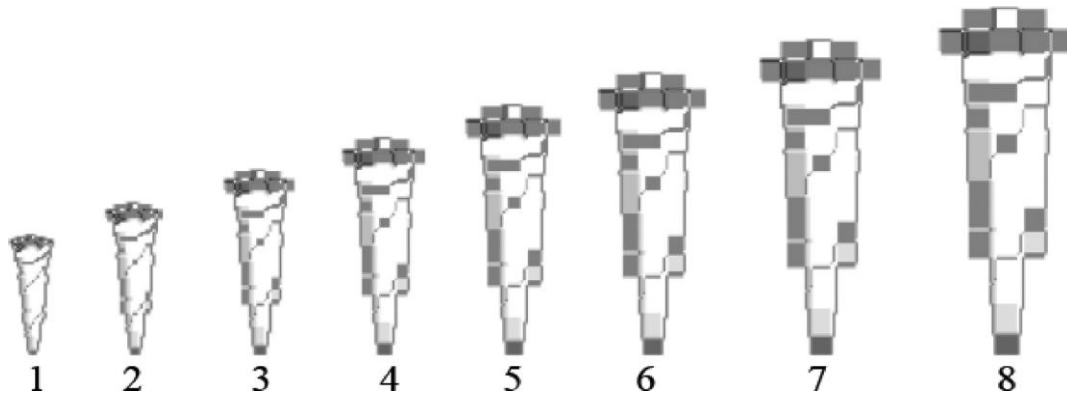
9. How old were you when you started regular daily marijuana smoking?

_____ (years)

10. For how many years, altogether, have you been a regular daily marijuana smoker?

_____ (years)

11. Think about your smoking during the **last week**, how much marijuana did you smoke per occasion in an average day (circle one)?



12. Think about your smoking during the **last week**, how often did you smoke marijuana in an average day?

13. When were you smoking the **heaviest**?

_____ (year)

14. How many times in your life have you made a serious attempt to quit using marijuana? (If more than 9 times, put 9)

_____ times

15. As best as you can remember, how long ago did you make your first attempt to quit marijuana smoking?

_____ (years)

16. How many years have you smoked marijuana?

_____ (total number of years)

17. How many different times in your life have you made an attempt to quit smoking marijuana where you have stayed off marijuana for 12 or more hours? (Do not include time sleeping)

18. Since you started smoking marijuana regularly, have you ever quit for a period of at least 24 hours?

1 = YES

0 = NO

19. Since you first started smoking marijuana, what was the **longest** period of time that you were able to stay off marijuana? (If less than 1 day, do not include time sleeping)

Years _____

Months_____

Days_____

Hours_____

20. Have you in the **past** had a disease or illness you believe was caused or aggravated by your smoking marijuana?

1 = YES 0 = NO

21. Do you have any symptoms **now** that you believe are caused by your smoking marijuana?

1 = YES 0 = NO

22. Do you have a disease or illness **now** that you believe is caused by or aggravated by your smoking marijuana?

1 = YES 0 = NO

Appendix C
Tobacco use survey

What is your smoking status?

- ☐ I smoke daily and more than 10 cigarettes per day
- ☐ I smoke daily more than 5 cigarettes but less than 10 cigarettes per day
- ☐ I smoke daily but less than 5 cigarettes per day
- ☐ I smoke weekly but not every day
- ☐ I smoke monthly but not weekly
- ☐ I no longer smoke at all, but in the past smoked at least 1 cigarette per day;

If so, how many cigarettes per day?
- ☐ I no longer smoke at all, but in the past I smoked weekly but not daily
- ☐ I have smoked a cigarette or a few, just to try it
- ☐ I have never smoked before, not even a puff

How many cigarettes do you smoke per day on average?

Number of cigarettes per day (20 cigarettes in a pack)

In the last 30 days, how many **days** have you smoked?

Number of days (please write your best estimate)

On the days that you smoked, about how many cigarettes you smoked per **day**?

Number of cigarettes per day (please state your best estimate)

Do you smoke cigars? Yes If so, how many per week?
 No

Do you use dip? Yes If so, how much per week?
 No

Do you use chew? Yes If so, how much per week?
 No

Do you use hookah? Yes If so, how much per week?
 No

At what age did you first smoke?

Have you ever smoked daily for 6 months or more? Yes
 No

For how many years have you smoked at least one cigarette per day?

What type of cigarettes do you usually smoke?

- ☐ Regular
- ☐ Lights
- ☐ Ultralights
- ☐ Menthol
- ☐ Menthol lights
- ☐ Menthol ultralights
- ☐ Rolled cigarettes
- ☐ Other: (please specify): _____

Have you ever changed this type of cigarette?

☐ Yes ☐ No

If so, for how long have you smoked your present brand? _____

How many times have you intentionally stopped smoking cigarettes for at least one day?

- ☐ None
- ☐ Once
- ☐ Twice
- ☐ Three times
- ☐ More than three times

When is the last time you tried to quit smoking? _____

Think of the longest time you quit smoking. For how long did you stop?

- ☐ I have never quit
- ☐ One day
- ☐ More than a day but less than a week
- ☐ One week
- ☐ More than a week but less than a month
- ☐ 1 to 3 months
- ☐ 4 to 6 months
- ☐ 6 to 12 months
- ☐ More than one year

During your longest quit attempt, did you gain weight? ☐ Yes ☐ No

If yes, how much weight did you gain? _____ pounds

In attempts to quit tobacco, have you ever used:

Nicotine patch ☐yes ☐no
Nicotine inhaler ☐yes ☐no
Cold turkey ☐yes ☐no
Zyban (Bupropion, Wellbutrin) ☐yes ☐no

Nicotine gum ☐yes ☐no
Nicotine nasal spray ☐yes ☐no
Slowly cutting back ☐yes ☐no

How interested are you in stopping smoking?

- ☐ Not at all
- ☐ A little
- ☐ Some
- ☐ A lot
- ☐ Very much so

If you decide to quit tobacco, why would you consider quitting?

- ☐ Personal choice
- ☐ Health
- ☐ Person close to me wants me to (wife, child, friend, etc.)
- ☐ Tobacco is expensive
- ☐ My faith
- ☐ Other _____

Appendix D

IN THE CALENDAR BELOW, PLEASE FILL-IN YOUR DRINKING RATE AND TIME DRINKING DURING A **TYPICAL WEEK** IN THE **LAST 90 DAYS**.

First, think of *typical week* in the *last 90 days*. Try to remember as accurately as you can, how much and for how long did you typically drink in a week during that 3 month period.

For each day of the week in the calendar below, fill in the number of standard drinks you typically consumed on that day in the upper box and the typical number of hours you drank that day in the lower box.

| Day of Week | Monday | Tuesday | Wednesday | Thursday | Friday | Saturday | Sunday |
|--------------------------|--------|---------|-----------|----------|--------|----------|--------|
| Number of Drinks | | | | | | | |
| Number of Hours Drinking | | | | | | | |

Appendix E SASH

Please circle one response for each question.

1. In general, what language(s) do you read and speak?

- | | | | | |
|--------------|---------------------------|--------------|---------------------------|--------------|
| 1 | 2 | 3 | 4 | 5 |
| Only Spanish | More Spanish than English | Both equally | More English than Spanish | Only English |

2. What was the language(s) you used as a child?

- | | | | | |
|--------------|---------------------------|--------------|---------------------------|--------------|
| 1 | 2 | 3 | 4 | 5 |
| Only Spanish | More Spanish than English | Both equally | More English than Spanish | Only English |

3. What language(s) do you usually speak at home?

- | | | | | |
|--------------|---------------------------|--------------|---------------------------|--------------|
| 1 | 2 | 3 | 4 | 5 |
| Only Spanish | More Spanish than English | Both equally | More English than Spanish | Only English |

4. In which language(s) do you usually think?

- | | | | | |
|--------------|---------------------------|--------------|---------------------------|--------------|
| 1 | 2 | 3 | 4 | 5 |
| Only Spanish | More Spanish than English | Both equally | More English than Spanish | Only English |

5. What language(s) do you usually speak with your friends?

- | | | | | |
|--------------|---------------------------|--------------|---------------------------|--------------|
| 1 | 2 | 3 | 4 | 5 |
| Only Spanish | More Spanish than English | Both equally | More English than Spanish | Only English |

6. In what language(s) are the T.V. programs you usually watch?

- | | | | | |
|--------------|---------------------------|--------------|---------------------------|--------------|
| 1 | 2 | 3 | 4 | 5 |
| Only Spanish | More Spanish than English | Both equally | More English than Spanish | Only English |

7. In what language(s) are the radio programs you usually listen to?

- | | | | | |
|--------------|---------------------------|--------------|---------------------------|--------------|
| 1 | 2 | 3 | 4 | 5 |
| Only Spanish | More Spanish than English | Both equally | More English than Spanish | Only English |

8. In general, what language(s) are the movies, T.V. and radio programs you prefer to watch and listen to?

| | | | | |
|-----------------|------------------------------|--------------|------------------------------|--------------|
| 1 | 2 | 3 | 4 | 5 |
| Only Spanish | More Spanish than English | Both equally | More English than Spanish | Only English |

9. Your close friends are

| | | | | |
|-----------------|------------------------------------|------------------------|------------------------------------|---------------------|
| 1 | 2 | 3 | 4 | 5 |
| All Hispanic | More Hispanic than Non-Hispanic | About half and half | More Non-Hispanic than Hispanic | All Non-Hispanic |

10. You prefer going to social gatherings/parties at which people are

| | | | | |
|-----------------|------------------------------------|------------------------|------------------------------------|---------------------|
| 1 | 2 | 3 | 4 | 5 |
| All Hispanic | More Hispanic than Non-Hispanic | About half and half | More Non-Hispanic than Hispanic | All Non-Hispanic |

11. The persons you visit or who visit you are

| | | | | |
|-----------------|------------------------------------|------------------------|------------------------------------|---------------------|
| 1 | 2 | 3 | 4 | 5 |
| All Hispanic | More Hispanic than Non-Hispanic | About half and half | More Non-Hispanic than Hispanic | All Non-Hispanic |

12. If you could choose your children's friends you would want them to be

| | | | | |
|-----------------|------------------------------------|------------------------|------------------------------------|---------------------|
| 1 | 2 | 3 | 4 | 5 |
| All Hispanic | More Hispanic than Non-Hispanic | About half and half | More Non-Hispanic than Hispanic | All Non-Hispanic |

Appendix F

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 (eg, 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 (eg, 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 (eg, 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 (eg, 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 (eg, 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 |
| 34. 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 (eg, in the hands) | 0 | 1 | 2 | 3 |
| 42. I found it difficult to work up the initiative to do things | 0 | 1 | 2 | 3 |

Vita

Joseph Ephraim Charter was born in Boston Massachusetts in June of 1986. He graduated from Coronado High School in El Paso, TX in 2004. He entered the University of Texas at El Paso in where he earned a bachelor's degree of Science in Psychology with a minor in Biology in 2009. He then attended the Master's in Clinical Psychology program at UTEP where he has worked with Dr. Theodore V. Cooper in the Prevention and treatment in Clinical Health Laboratory conducting research in light smoking cessation. He was a co-author on a manuscript published in *Addictive Behaviors* labeled: Characteristics associated with smoking in a Hispanic college sample.

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This thesis was typed by Joseph Ephraim Charter.