

Situational Marijuana Use: Predicting Outcomes in Treatment-Seeking Adults

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ABSTRACT

Cognitive behavior theory indicates that situational determinants may have a substantial impact on substance use and relapse into use. The present study described situational use of marijuana in dependent individuals, analyzed relationships among various constructs in existing theory, determined their effects on treatment outcomes, and explored interactions with self-efficacy. Results were generally consistent with hypotheses. Use in negative affective situations was independently associated with psychological distress, maladaptive coping strategies, and poorer outcomes post-treatment. Additionally, negative affective use interacted with self-efficacy for psychologically distressing situations to produce differential outcomes. This study adds to the existing literature on situational marijuana use by establishing relationships with motives for use and lending support to the cognitive behavioral theory model.

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Situational Marijuana Use: Predicting Outcomes in Treatment-Seeking Adults

**Introduction**

Illicit drug abuse and dependence are prevalent problems in the United States. The 2011 Substance Abuse and Mental Health Services Administration (SAMHSA) National Survey on Drug Use and Health estimated that 14.9% of the U.S. population age 12 or older had used illicit drugs in the past year (SAMHSA, 2011). Results indicated that marijuana use was by far the most common illicit drug of use, with 11.5% of the population using the substance in the previous year. Almost half of the population aged 12 and older (41.9%) has tried marijuana at least once in their lifetime. SAMHSA estimates that of the 2.5% of Americans 12 and older who meet criteria for illicit drug abuse or dependence, marijuana or hashish abuse or dependence represents the highest percentage of this estimate, with 1.6% of the American population meeting diagnostic criteria.

Long-term, chronic use of marijuana has been associated with various physical and psychological problems, including respiratory issues and problems with attention, memory, and concentration (see Stephens & Banes, in press, for a comprehensive review). Emerging evidence has also suggested that chronic marijuana use is related to neuropsychological and cognitive decline in adolescent-onset users (Meier et al., 2012). Additionally, individuals who are chronic users report a variety of problems as a result of marijuana use, such as guilt, lower energy level, lower self-esteem, and relationship problems (Stephens, Babor, Kadden, & Miller, 2002). Due to the high rates of abuse and dependence along with the various potential problems associated with long-term use,

there is a need to identify and understand individual differences and processes that predict persistent problematic use and response to treatment.

Treatment programs based on cognitive behavioral therapy (CBT; e.g., Marlatt & Gordon, 1985) posit that addictive behaviors are learned, maladaptive responses to specific situations. This model describes relapse (or substance use, in general) as a potential outcome of a high-risk situation: if an individual has no adaptive coping response for the high-risk situation, then they will have decreased self-efficacy and more positive outcome expectancies for the effects of a substance or addictive behavior. Together, these components lead to an initial lapse into substance use, which may lead to internal conflict and guilt, and an increased probability of a full relapse into substance use. Alternatively, if an individual has an effective coping response for the situation, then they will experience increased self-efficacy and have a decreased probability of relapse into substance use.

Cummings and colleagues were among the first researchers to consider the importance of situational determinants for relapse. The researchers coded open-ended commonly-endorsed relapse situations into eight categories (Cummings, Gordon, & Marlatt, 1980) which included intrapersonal determinants (negative emotional states, negative physical-physiological states, positive emotional states, testing personal control, temptations or urges) and interpersonal determinants (interpersonal conflict, social pressure, and positive emotional states). The most commonly cited relapse situations across a variety of substance abusing populations, accounting for approximately 35% of lapses/relapses into the addictive behavior, involved coping with negative emotional states (e.g., frustration, anger, depression). The next most commonly cited relapse



situations were social pressure (20%) and interpersonal conflict (16%). In the field of marijuana research, few studies have been published on situational determinants of use. Stephens and colleagues categorized situational determinants of relapse into marijuana use following treatment (Stephens, Curtin, Simpson, & Roffman, 1994). Similar to findings for other drugs of abuse, the most highly endorsed situational determinants of relapse were negative emotional states (33%), social pressure (24%) and positive emotional states (22%). Therefore, it appears that coping with negative emotional states is a frequent situation cited for relapse for a variety of addictive substances and behaviors.

More standardized methods of studying situational substance use, such as the Inventory of Drinking Situations (IDS; Annis, Graham, & Davis, 1987) and Inventory of Drug-Taking Situations (IDTS; Turner, Annis, & Sklar, 1997), have employed the eight categories of relapse situations previously described by Cummings and colleagues (1980). Although it is widely accepted that specific situations are important predictors of use, situational inventories are rarely used in treatment studies. The situational inventory assessment has been used primarily with alcohol as a way to categorize high-risk situations to predict relapse (Cannon, Leeka, Patterson, & Baker, 1990), to group participants into types of users with specific characteristics and styles of drinking (Annis & Graham, 1995), or to predict alcohol-related problem severity (Cunningham, Sobell, Sobell, Gavin, & Annis, 1995).

In addition to predicting use patterns, certain types of situational use have been related to aspects of emotional health. Previous research has determined that various subscales of the IDS/IDTS (e.g., Unpleasant Emotions, Conflict With Others) are related

to psychological distress, such as symptoms of depression, interpersonal sensitivity, and somatization (Turner, et al., 1997). These findings suggest that use in particular types of situations may provide insight into motives for substance use. For instance, high rates of use in situations characterized by negative affect suggest that individuals may be using substances for the purpose of coping with negative affect. Preliminary research found a correlation between categories of a situational inventory and drinking motives among college students (Carrigan, Barton Samoluk, & Stewart, 1998). The link between situational use and motives has also been found in a community sample of drug- and alcohol-abusing women (Stewart, Samoluk, Conrod, Pihl, & Dongier, 2000), providing further evidence of convergent validity between measures of situational use and motives for use.

Motivational models of substance use have characterized motives for use as the “final, common pathway” to use (Cox & Klinger, 1988) and “proximal determinants” of use (Cooper, 1994) which could be categorized on the basis of valence (positive or negative reinforcement) and source (internal or external). Based on this framework, four distinct categories for substance use motivation were hypothesized: to enhance enjoyable emotions (internal source, positive reinforcement), to cope with negative emotions (internal source, negative reinforcement), to be more social (external source, positive reinforcement), and to conform with others (external source, negative reinforcement). One additional factor was added for use in a marijuana population: to expand the mind (Simons, Correia, Carey, & Borsari, 1998). Although the most frequently endorsed motives for use of alcohol and marijuana among users are to be more social or for enhancement of enjoyable experiences (Simons, Correia, & Carey, 2000), using alcohol

and drugs to cope with negative affect represents one particularly problematic motive. Various studies have determined that individuals who use substances with a motive of coping with negative emotions experience more negative consequences than individuals who use for other motives (see e.g., Bonn-Miller, Zvolensky, & Bernstein, 2007; Cooper, 1994; Cooper, Russell, & George, 1988; Neighbors, Lee, Lewis, Fossos, & Larimer, 2007). In a study of the effect of brief, Motivational Enhancement Therapy (MET) interventions for adolescent marijuana users, Fox and colleagues found that although the social and enhancement motives were the most commonly endorsed motive, the coping motive was associated with the greater marijuana problems and cannabis dependence symptoms (Fox, Towe, Stephens, Walker, & Roffman, 2011). In other studies, individuals who endorse the coping motive were also more likely to have a higher rates of marijuana use, anxiety sensitivity (Bonn-Miller, et al., 2007; Buckner, Heimberg, Matthews, & Silgado, 2012; Zvolensky et al., 2007), and anhedonia (Zvolensky, et al., 2007). Thus, the tendency to use marijuana in negative affect situations may imply a use for coping purposes and predict greater problems as a result.

In addition to insights into motives for use, use in specific situations may predict outcomes through its interaction with self-efficacy. According to self-efficacy theory and the CBT model, self-efficacy ratings are dependent upon context and situation: an individual may endorse high self-efficacy for their ability to use an appropriate coping response in one type of situation (e.g., social pressure) but feel lower self-efficacy for their ability to abstain from substance use in another situation (e.g., negative affect). Since self-efficacy ratings may vary across contexts, commonly used self-efficacy scales typically assess confidence in avoiding use in specific types of situations. Findings have

generally shown that higher self-efficacy ratings for avoiding drug use are associated with better treatment outcomes among alcohol and drug users (Kadden & Litt, 2011; Stephens, Wertz, & Roffman, 1993). Previous research has shown that psychological distress is related to self-efficacy for psychologically-distressing (PD) situations, and that self-efficacy can predict marijuana use after treatment (see DeMarce, Stephens, & Roffman, 2005). Thus, low self-efficacy for negative affective situations in individuals who frequently experience negative affect may interact to predict problematic use.

The current study had four main goals. The first three goals were designed to characterize situational use of marijuana in a dependent population and test whether relationships with situational use variables mirrored those expected for substance use motives. The fourth goal was designed to test the CBT model by focusing on the interaction between use in negative affect situations and self-efficacy for avoiding use in those same situations.

The first goal was to describe situational use in an adult, marijuana dependent, treatment-seeking population. Over the past 20 years, much research has been conducted on cannabis use and motives for use in a non-dependent population (Bonn-Miller, et al., 2007; Simons, Gaher, Correia, Hansen, & Christopher, 2005; Zoccolillo, Vitaro, & Tremblay, 1999; Zvolensky, et al., 2007). However, we know much less about a marijuana dependent, treatment-seeking population. Specifically, the study aimed to describe situational use of marijuana in an adult, dependent, treatment-seeking population with particular attention to the type of situations in which an individual uses and the associated emotional valence of such situations. Additionally, relationships between situational use and sociodemographic variables were assessed.

The second goal of the study was to examine the relationship between situational use, particularly use in negative affect situations, and other characteristics and psychological constructs of users. A pattern of relationships was proposed that would support negative affect situational use as an indicator of the coping motive. It was hypothesized that negative affect situational use would be positively associated with psychological distress and maladaptive coping strategies.

The third goal of the proposed study was to test relationships between negative affect, positive affect, and social situational use and frequency of marijuana use and related problems predicted by the literature on drug and alcohol use motives. It was hypothesized that negative affect situational use would be associated with a higher frequency of marijuana use, more dependence symptoms, and more marijuana-related problems, both before and after treatment.

The fourth goal of the study was to test the CBT model proposition that self-efficacy for avoiding use moderates the relationship between a tendency toward negative affect situational use and future marijuana use outcomes. It was hypothesized that negative affective situational use would be associated with low self-efficacy for avoiding use in psychologically distressing situations. Additionally, it was hypothesized that low self-efficacy for avoiding use in negative affective situations would be associated with a greater problems and dependence related to marijuana use for individuals who endorsed negative situational use. Conversely, we expected that high self-efficacy would be associated with fewer marijuana related problems for those with a tendency to use in negative affective situations.

## Methods

### Overview of Parent Clinical Trial

The present investigation utilized data from a randomized, controlled treatment study conducted by Stephens and colleagues (Stephens et al., 2006). Eighty-seven participants were randomly assigned to one of two intervention conditions: 1) 9 individual sessions of combined CBT, Motivational Enhancement Therapy (MET), and Case Management (CM); or 2) 4-sessions of the same combined treatment components with the option of attending more sessions as needed (PRN) over the following 30 months. The primary hypothesis was that individuals who could return to treatment as needed would achieve superior outcomes compared to a fixed-dose treatment condition. Participants were assessed at baseline, 4 months, 10 months, 16 months, 22 months, 28 months, and 34 months. The results indicated that participants in both conditions made significant reductions in frequency of use, dependence symptoms, and marijuana problems that were sustained across all follow-up assessments ( $ps < .01$ ). Unexpectedly, two-way condition by outcome analyses indicated that there was higher reduction in frequency of use in the 9-session condition relative to the PRN condition at the 4-month follow-up. Contrary to predictions there were no statistically significant differences in marijuana use outcomes between conditions at later follow-ups. The present paper uses measures obtained from the sample at baseline and various follow-up assessments.

### Participants

Participants were screened by phone for eligibility prior to enrollment and baseline assessment. Of the 203 individuals screened, 70 were deemed ineligible, due to involvement in another form of treatment ( $N = 27$ ), dependence on other drugs or alcohol

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( $N = 26$ ), using marijuana on less than 50 of the last 90 days ( $N=21$ ), or other eligibility criteria (i.e., the presence of a medical or psychiatric condition that may require hospitalization, legal problems that may require future incarceration, mandatory drug testing for legal reasons or employment, refusal to be randomized, and non-fluency in English;  $N=15$ ). Of the eligible participants, 46 individuals chose not to participate in the study. The final sample included 87 participants: 43 participants were randomly assigned to the PRN condition and 44 were assigned to the 9-session condition. Participants were an average age of 35.6 years old ( $SD = 8.7$ ) and were predominantly Caucasian (86%). The majority of participants were male (75%) and were either married or cohabitating (49%). The mean years of education was 14.2. On average, these participants used marijuana on 78% of the days in the month preceding enrollment. On the days when marijuana was used, participants reported smoking an average of 3.9 times per day.

### **Procedures**

In order to screen for eligibility, a brief phone interview was conducted by research staff (see Appendix H). Once eligibility was determined to be likely, an introductory in-person meeting was scheduled in order to formally determine that a participant was eligible for participation. Participants were provided an overview of the informed consent process, read and signed the consent form (Appendix J), and were given a copy for their records. The Basic Demographic Sheet (BDS; Appendix I) was completed in order to further determine eligibility. Participants who would be unavailable to participate in the study in the future due to legal problems or incarceration were excluded, as were individuals who were required to take mandatory drug testing for employment or legal status, those who were referred by a parole officer or judge in lieu

of incarceration, individuals who refused to participate in the randomization procedures, and individuals who were not fluent in English.

Next, all individuals were administered the following modules of the Structured Clinical Interview for DSM-IV in order to facilitate in the eligibility decision (SCID-I; First, Spitzer, Gibbon, & Williams, 1996; Appendix G): marijuana abuse and dependence, alcohol or other substance dependence (based on the results of a screener for drug and alcohol use), and psychosis (if any symptoms of active psychosis were present). Participants were required to meet eligibility for marijuana dependence, and could not meet eligibility criteria for dependence on another substance. Additionally, participants could not meet diagnostic criteria for psychosis. Finally, individuals who were eligible for the study were asked to complete several self-report questionnaires, to be brought back to the researchers at a second baseline assessment session. During the second session, the self-report questionnaires were collected. Participants provided a sample of urine that was analyzed by an independent laboratory for drug metabolites. Additionally, a Timeline Followback interview was performed (TLFB; Sobell & Sobell, 1992; Appendix F) in order to obtain information on marijuana, alcohol, and other drug use. At the completion of the session, participants were randomized to condition based on a system of stratified permuted blocks.

In persons, follow-up assessment interviews were completed at 4, 10, 16, 22, 28, and 34 months following random assignment. During these assessments, self-report questionnaires, TLFB, and the SCID module for marijuana dependence were completed. Additionally, participants provided urine samples at each follow-up assessment to serve



as corroboration of self-reports. Agreement between self-reported abstinence rates and urinalysis results were 79% and above through the 22-month follow-up.

## **Measures**

### **Inventory of Marijuana Situations.**

The Inventory of Marijuana Situations (IMS; Appendix A) is a 41-item self-report situational inventory assessment. The IMS assesses the frequency of marijuana use in specific situations over the past 90 days. Participants rank their frequency of use in each situation on a scale of 1 (Never) to 4 (Almost Always). The IMS was administered at baseline and the 4-month follow-up. The measure was adapted from the short form of the Inventory of Drinking Situations (IDS-42; Annis et al., 1987). In order to describe situational marijuana use, items from the IMS were examined and subjected to principal components analysis. Scree plots of eigenvalues were used to identify the number of components in these data along with item content and loading patterns. Preliminary principal components analysis and examination of item means and standard deviations led to the elimination of 17 items that were either infrequently endorsed or did not differentiate clearly in the component structure. This process was repeated iteratively and four more items were eliminated due to redundancy of item content and minimal impact on internal consistency reliabilities, leaving the investigators with three scales that measured the following: use in negative affect situations, use in social situations, and use in positive affect situations. Items within each scale were averaged to create scales on which higher scores indicate a greater tendency to use in these situations. Factor loadings, means, and standard deviations are presented in Table 1. Appendix B contains the means

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and standard deviations of all dropped items, along with a brief description for the rationale of dropping the item.

The Negative Affective Use scale was comprised of 10 items describing use, including: when I was depressed about things in general; when I had an argument with a friend, romantic partner, or spouse; when I felt jumpy and physically tense; when I felt sad; when I was unhappy with my job; when I felt empty inside; when I was feeling lonely; when I was angry; when there were problems with people at work; and when I felt no one really cared what happened to me. Internal consistency analyses indicated that the Cronbach's alpha for the Negative Affective Use scale was 0.92 at baseline and 0.95 at the 4-month follow-up.

The Social Use scale consisted of six items describing use in various situations involving other people: when I met a friend and he/she suggested that we smoke pot together; when I was relaxed with a friend and wanted to have a good time; when I was at a party or out with friends and other people were smoking marijuana; when someone in the same room was smoking marijuana; when I was invited to someone's home and they offered me pot; and when I was having fun with friends and wanted to increase our enjoyment. The scale was found to have good internal consistency, with a Cronbach's alpha of 0.93 at baseline and 0.96 at 4-month follow-up.

The four items that comprised the Positive Affective Use scale were: when I felt confident and relaxed; when everything was going well; when I felt satisfied with something I had done; and when I was feeling content with my life. Cronbach's alpha was 0.83 at baseline and 0.93 at 4-month follow-up.

### **Situational Self-Efficacy Scale.**

The Situational Self-Efficacy Scale (SSES) is a 20-item self-report measure designed to capture the amount of confidence that an individual has in their ability to resist the temptation to smoke marijuana in a variety of situations (Stephens, et al., 1993; Stephens, Wertz, & Roffman, 1995; Appendix C). Each item is ranked on a scale of 1 (Not at All Confident) to 7 (Very Confident). The SSES was broken into two subscales, based on previous research: self-efficacy for psychologically-distressing (PDSE) situations and nonpsychologically-distressing (NPDSE) situations (DeMarce, et al., 2005). The PDSE scale includes eight situational items: wanting to feel more confident; depressed or worried; frustrated; want to feel better about self; angry; embarrassed; uncomfortable social situation; and stressed and need to calm down. The NPDSE scale is comprised of the following eight situational items: feel like celebrating; free time to self without responsibilities; pleasant social situation; spouse or close friend smoking; seeing someone else enjoying it; offered marijuana; at a party with others smoking; and on vacation. The SSES has been used by the questionnaire's author in a variety of studies and has been found to have good reliability (DeMarce, et al., 2005; Litt, Kadden, & Stephens, 2005; Stephens, et al., 1993, 1995). Items were averaged to create scale scores. At baseline, the two subscales have alphas ranging from 0.86-0.90

### **Brief Symptom Inventory.**

The Brief Symptom Inventory (BSI) is a frequently used self-report questionnaire of psychological distress (Derogatis & Melisaratos, 1983; Appendix D) that was adapted from the longer Symptom Checklist-90-Revised. The BSI has been found to have high levels of reliability and validity (Derogatis & Melisaratos, 1983). The BSI is comprised of 53 items which are answered on a scale of 1 (Not at All) to 5 (Extremely) for the

amount of distress the individual has experienced over the past 7 days. The BSI assesses psychiatric symptoms on the following nine subscales, but the Global Severity Index (GSI) was used for the present study and was created by averaging response to all 53 items.

### **COPE Inventory**

The COPE Inventory is a 60-item measure that assesses a broad range of coping strategies for difficult life situations (Appendix E). The measure, which was administered only at baseline, asked participants how often they responded in a certain way to stressful or difficult situations on a scale of 1-4: 1, “I usually don’t do this at all”; 2, “I usually do this a little bit”; 3, “I usually do this a medium amount”; and 4, “I usually do this a lot” (Carver, Scheier, & Weintraub, 1989). The following subscales of the COPE measure were used in the current study: Active Coping ( $\alpha = .73$ ), Acceptance ( $\alpha = .46$ ), Planning ( $\alpha = .83$ ), Substance Use ( $\alpha = .91$ ), Mental Disengagement ( $\alpha = .34$ ), and Behavioral Disengagement ( $\alpha = .75$ ). Scale scores were created by averaging items comprising each scale.

### **Outcome Measures**

#### **Timeline Follow-Back.**

The Timeline Follow-Back (TLFB) was used to assess marijuana use frequency (Appendix F). The TLFB was initially created for the purpose of aiding individuals in the recall of past alcohol use (Sobell & Sobell, 1992), but has since been used for other drugs, including marijuana (e.g., Litt, et al., 2005; Stephens, et al., 2002; Stephens et al., 2004). The TLFB is a semi-structured technique that uses key dates (e.g., holidays,

paydays), which assessors fill into calendars, in order to elicit recall of substance use. Participants completed the TLFB at the initial baseline session and at each subsequent follow-up. The TLFB has been found to have good to excellent validity and reliability for assessing frequency of use, and is consistent with results of urine tests and collateral reports (Rohsenow, 2008). A 30-day window of use at each assessment point was used for analyses in this study.

### **Marijuana Problems Scale.**

The Marijuana Problems Scale (MPS; Appendix G) was added to the assessment battery in order to measure a variety of potential problems that are associated with marijuana use (Stephens, Roffman, & Curtin, 2000). The MPS was administered at the initial baseline session and at each subsequent follow-up session. The MPS assesses for 19 negative consequences on a three-point scale over the previous 90 days: 0 (not a marijuana problem), 1 (minor problem of marijuana use), and 2 (major problem of marijuana use). The MPS has been found to have good reliability (Stephens, et al., 2000). Items endorsed on the MPS measure as either a minor or major problem were counted to create each participant's MPS score.

### **Structured Clinical Interview for DSM-IV.**

The Structured Clinical Interview for DSM-IV (SCID-I; First, et al., 1996; Appendix G) was used to assess marijuana use and dependence symptoms at baseline and all follow-up assessments. The SCID-I is a semi-structured interview that is performed by a clinically trained interviewer. Each of the 7 marijuana dependence items were coded either 1 (symptom not present), 2 (the symptom was present but below the diagnostic threshold), or 3 (the symptom was present and above the threshold). The

number of items coded 3 were added to create a continuous variable describing the number of dependence symptoms endorsed. The SCID-I has been determined to be a reliable method for assessing substance dependence (Rohsenow, 2008).

## **Results**

### **Preliminary Analyses**

Of the 87 participants, 94.3% completed the 4-month follow-up ( $n = 82$ ), 89.7% completed the 10-month follow up ( $n = 78$ ), 88.5% completed the 16-month follow-up ( $n = 77$ ), and 87.4% completed the 22-month follow-up ( $n=76$ ). In order to examine whether attrition had an effect on the observed results, two-way condition by attrition ANOVAs were performed on baseline measures separately based on availability at the 4, 10, 16, and 22 month follow-up assessments. Participants in the PRN condition were more likely to attrite at the 16-month follow up ( $p < 0.05$ ). No other significant differences were found by condition at the later follow-up. Demographic variables and control variables were compared for those who completed and did not complete each follow-up assessment. No significant differences were found by attrition. There was no interaction effect between attrition and condition, indicating that there was no differential attrition by treatment condition at follow-up for any variables.

### **Description of Situational Use**

The first goal of the study was to describe situational use in an adult, marijuana dependent, treatment-seeking population. Means and standard deviations of the Negative Affective, Positive Affective, and Social Use scales of the IMS were examined in order to characterize the relative frequency of use of marijuana in various situations (see Table 2). At baseline and 4 months, the Social Use scale was endorsed most frequently. The

second most commonly endorsed situational determinant scale was the Positive Affective Use scale, and the Negative Affective Use scale was the least commonly endorsed. All three scales were significantly different from one another at baseline. At the 4-month time point, the Negative Affective Use and Social Use subscales were significant different as well as the Positive Affective Use and Social Use subscales. Two-way condition by time ANOVAs performed on each IMS subscale showed only significant time effects, indicating significant reductions in the mean of each IMS subscale at 4-month follow-up relative to baseline ( $p < 0.01$ ) but no effects of treatment condition.

Bivariate correlations between the situational scales at the baseline assessment and 4-month follow-up are shown in Table 3. Significant positive correlations were found between IMS scales at both time points. Comparisons of correlation coefficients indicated that all relationships between the scales were significantly stronger at 4-month follow-up compared to baseline ( $p < 0.01$ ). Separate analyses indicated that all subscales of the IMS were moderately stable between the baseline assessment and 4-month follow-up (Negative Affective Use,  $r=0.24$ ,  $p < 0.05$ ; Social Use,  $r=0.30$ ,  $p < 0.01$ ; Positive Affective Use,  $r = 0.41$ ,  $p < 0.01$ ), which indicates that there is a fair amount of within person change in situational use over time.

Individuals who endorsed higher Negative Affective Use had fewer years of education ( $r = -0.27$ ,  $p < 0.05$ ), and those who endorsed more Social Use were younger ( $r = -0.33$ ,  $p < 0.01$ ). No other differences were observed on the demographic variables of age and marital status.

**Relationship with Distress and Coping**

The second goal of the study was to examine predicted relationships between situational use scales and related psychosocial constructs. We predicted that the Negative Affect Use scale of the IMS would be positively correlated with psychological distress (assessed by the BSI) and certain maladaptive coping styles assessed by the COPE (i.e., Substance Use, Behavioral Disengagement, Mental Disengagement subscales). No specific relationships were hypothesized between Social Use and Positive Affect Use subscales and other constructs assessed in this study.

Table 4 contains correlations between IMS scales, coping strategies, and psychological distress scores. Consistent with hypotheses, the Negative Affective Use subscale of the IMS at baseline was positively correlated with the BSI Global Severity Index, and the Substance Use, Behavioral Disengagement, and Mental Disengagement subscales of the COPE. Additionally, Negative Affective Use at baseline was negatively associated with the Active Coping and Planning subscales, and unassociated with the Acceptance subscale. No significant relationships were observed between the Social or Positive Affective Use scales and COPE subscales at baseline.

Unexpectedly, Social Situational Use at baseline was correlated positively with the BSI at baseline. Further, when 4-month follow-up IMS scales were correlated with BSI assessed at the 4-month follow-up, all three IMS scales were significantly correlated with BSI: Negative Affective Use ( $r = 0.61, p < 0.01$ ), Social Use ( $r = 0.32, p < 0.01$ ), and Positive Affective Use ( $r = 0.37, p < 0.01$ ). In order to determine whether these unexpected relationships between social and positive affective situational use and psychological distress were an artifact of covariance with negative affective use, we



computed regression equations predicting BSI score from all three situational use scales simultaneously at both the baseline assessment and 4-month follow-up. In these analyses, only the Negative Affect Use subscale of the IMS yielded significant regression coefficients. Negative Affective Use at baseline was significantly associated with baseline BSI ( $\beta = 0.53, p < 0.01$ ) and Negative Affective Use at the 4-month follow-up was significantly associated with BSI at 4-months ( $\beta = 0.84, p < 0.01$ ) when controlling for the other IMS scales.

### **Relationship with Marijuana Outcomes**

The third goal of the proposed study was to test predicted relationships between negative affective situational use and the extent of marijuana use and related negative consequences. We examined the relationship between use in negative affect situations and frequency of marijuana use, marijuana problems, and dependence symptoms using correlational and regression analysis. Based on the drug use motives literature, it was predicted that use in negative affective situations would be associated with higher frequency of marijuana use, more dependence symptoms, and more problems related to marijuana use both before and after treatment.

Table 5 contains bivariate correlations of the baseline IMS scales with baseline and 4-month follow-up marijuana use and related outcome variables. As predicted, baseline Negative Affective Use was correlated with marijuana problems and dependence symptoms at baseline and with marijuana problems at the 4-month follow-up. Predicted relationships with frequency of use were not found at baseline or 4-month follow-up and the relationship with dependence symptoms was no longer significant in the prospective prediction of 4-month outcomes. Unexpectedly, Social Use at baseline was also

correlated with marijuana problems at baseline and baseline Positive Affective situational use was associated with marijuana problems and dependence symptoms at the 4-month follow-up. Table 6 also contains bivariate correlations between 4-month IMS scales and 4-, 10-, 16-, and 22-month follow-up outcome variables. All IMS scales at 4-month follow-up were positively correlated with outcomes at all follow-up time points.

Multiple regression analyses examined Negative Affective Use, Positive Affective Use, and Social Use simultaneously as multivariate predictors of marijuana use and related consequences to determine whether there were additive and unique effects of the different types of situational use. Table 7 shows standardized regression coefficients. Consistent with hypotheses, Negative Affective Use at baseline was uniquely associated with the baseline marijuana problems. However, there were no significant predictors in the models predicting frequency of use or dependence symptoms at baseline. Baseline IMS scales did not predict any of the marijuana use outcome variables at the 4-month follow-up. Controlling for frequency of use, Negative Affective Use was still associated with baseline marijuana problems.

When these analyses were repeated using 4-month situational marijuana use scales to predict marijuana use variables at 4, 10, 16 and 22 month follow-ups, several significant relationships were observed (see Table 8). Negative Affective Use at the 4-month follow-up uniquely predicted marijuana use, problems and dependence symptoms at 4-months and Positive Affective Use predicted marijuana use. In prospective analyses using 4-month IMS subscales to predict marijuana use and related consequences at future follow-ups, Negative Affective Use at 4-months was associated with marijuana problems and marijuana dependence symptoms at the 16-month follow-up (see Table 8) but not at

10 or 22 months. The Positive Affective Use subscale at 4 months predicted use, problems and dependence symptoms at 10 months but no other outcomes at future follow-ups. In subsequent analyses when frequency of use was controlled for, the same pattern of findings between situational use, problems, and dependence was evident.

### **Situational Use and Self-Efficacy**

The fourth goal of the study was to test the hypothesis from CBT that self-efficacy for avoiding use in negative affective situations moderates its impact on negative outcomes from marijuana use. It was hypothesized that Negative Affective Use would be associated with lower self-efficacy for psychologically distressing situations (i.e. PDSE). Additionally, it was hypothesized that frequent use in negative affect situations would interact with low self-efficacy in those situations to produce more problems and dependence.

Table 9 presents bivariate correlations of baseline and 4-month IMS scales with situational self-efficacy (SSES) scales at the concurrent time point. Consistent with hypotheses, Negative Affective Use at baseline was negatively correlated with PDSE at baseline. No other IMS scales at baseline were correlated with self-efficacy scales in the bivariate tests. At the 4-month follow-up, all situational use scales (Negative Affective Use, Social Use, and Positive Affective Use) were significantly and negatively correlated with both self-efficacy scales.

Next multiple regression analyses were used to examine the relationships between IMS and self-efficacy scales at both time points (see Table 10). First, IMS scales at baseline were entered to independently predict PDSE and NPDSE at baseline. Consistent with hypotheses, results indicated that baseline Negative Affective Use uniquely

predicted lower PDSE scores. No other situational use scales were related to self-efficacy after including Negative Affective Use in the models. Next, IMS scales at 4-month follow-up were entered to predict 4-month follow-up PDSE and NPDSE. Negative Affective Use negatively was negatively related to both PDSE and NPDSE. Social Use negatively predicted NPDSE.

In order to test whether self-efficacy for avoiding use in negative affect situations moderated the effect of a tendency to use in negative affect situations, interaction terms were created as a product of the centered, situational use and self-efficacy variables at baseline and 4-month follow-up. These interaction terms were used in new regression models predicting the marijuana outcome variables of frequency, marijuana dependence and marijuana problems post-treatment. We expected that there would be significant regression weights associated with the Negative Affect by PDSE interaction term.

Negative Affective Use, PDSE, and their interaction term were entered into regression equations to predict outcomes at 4-months (see Table 11). PDSE negatively predicted use ( $\beta = -0.31, p < 0.01$ ), marijuana problems ( $\beta = -0.25, p < 0.05$ ), and dependence symptoms ( $\beta = -0.24, p < 0.05$ ). The interaction of Negative Affective Use and PDSE significantly predicted dependence symptoms at the 4-month follow-up ( $\beta = -0.25, p < 0.05$ ). To illustrate the interaction, a simple slope analysis was performed in which three slope lines of the relationships between PDSE and dependence symptoms were computed and graphed at different levels of Negative Affective Use (at the mean, at one standard deviation below the mean, and at one standard deviation above the mean; Aiken and West (1991)). As shown in Figure 1, the relationship between PDSE and dependence symptoms was stronger for those who frequently used marijuana in negative

affective situations. Specifically, individuals who tended to use more in negative affective situations and who had low PDSE scores had the highest number of marijuana dependence symptoms relative to those who used less frequently in negative affective situations. Conversely, individuals who tended to use more in negative affective situations but had higher PDSE scores endorsed the lowest number of dependence symptoms. As might have been expected, there was little relationship between PDSE and dependence scores for those who endorsed less Negative Affective Use. No other significant differences were found for baseline variables predicting outcomes at the 4-month follow-up. This process was repeated for the 4-month follow-up Negative Affective Use scale and PDSE predicting outcomes at the 10-, 16-, and 22-month follow-ups. Table 11 shows that PDSE predicted less use, problems, and dependence at all time points. The interaction of Negative Affective Use and PDSE again predicted dependence symptoms at 10-months ( $\beta = -0.21, p < 0.05$ ), but not at 16- and 22-months (see Table 11 and Figure 2). No effects were found for the prediction of frequency of use or marijuana problems in any of the interaction analyses.

### **Discussion**

The goals of the present paper were to describe situational use of marijuana in dependent individuals, confirm relationships between negative affective use and related constructs, determine the effect of situational use on marijuana-related consequences, and test the hypothesized interaction between self-efficacy and negative affective situational use in predicting outcomes. Negative affective use, although the least endorsed situational context, was related to psychological distress and correlated with maladaptive coping strategies. Further, individuals who endorsed use in negative affective situations

had more negative outcomes at posttreatment follow-ups. Only negative affective use uniquely predicted lower self-efficacy for psychologically distressing situations, which in turn predicted frequency of use, problems, and symptoms at all follow-ups. The interaction of negative affective use and self-efficacy in predicting dependence symptoms at two follow-ups indicated that higher self-efficacy ameliorated some of the deleterious effects of negative affective use.

Similar to other research in the motives literature, negative affective use was not the most commonly endorsed situation for use. Use in social situations was more commonly endorsed in this dependent sample both before and after treatment. Endorsement of all situational use scales decreased after treatment, consistent with the known effect of the treatments on other indices of use. Indeed, the three IMS scales appeared to be only moderately stable over time, indicating that there was substantial change in the types of situations in which use occurred within individuals. Positive correlations between IMS scales at the baseline and 4-months indicated that individuals who endorsed high use in one situation were more likely to use in other situations, as well. IMS scale scores likely covary with each other and with frequency of use in general because the measure asks participants to respond in terms of how often they use in specific situations. A similar correlation between different motives scales has been noted in the literature, perhaps again because measures of motives use scales also implicitly measure frequency of use (Fox, et al., 2011; Simons et al., 1998; Zvolensky, et al., 2007).

Overall, there is evidence to support the Inventory of Marijuana Situations as a meaningful measure of situational use. There was support for the hypotheses that

negative affect use would be positively correlated with psychological distress and more maladaptive coping strategies. Negative affective use also was negatively correlated with more adaptive coping strategies (i.e., Active Coping and Planning). These findings help establish that a tendency to use marijuana in negative affective situations reflects both current affective disposition and a maladaptive coping style. A similar pattern of findings on drug use motives suggests that measuring use in negative affective situations taps into the coping motive for use (Brodbeck, Matter, Page, & Moggi, 2007; Bujarski, Norberg, & Copeland, 2012).

Although all three posttreatment IMS scales showed univariate relationships with marijuana use outcomes and consequences, multivariate analyses showed that use in negative affective and positive affective situations retained some unique predictive power. The findings for negative affective use are similar to the literature on the coping motive, which has found unique effects of the coping motive on drug use problems when controlling for other motives for use (e.g., Cooper et al., 2008; Fox, et al., 2011). Positive affective use at 4 months also predicted greater marijuana use at the concurrent timepoint and use, problems, and dependence symptoms at one future time point but not at others. Although this relationship was not predicted, enhancement motives have sometimes been associated with negative outcomes among alcohol users (Agrawal et al., 2008; Cooper, 1994; Cooper et al., 1995) and marijuana users (Zvolensky, et al., 2007). Some investigators have theorized that the relationship between positive affective use and negative outcomes may be representative of a first step toward using in negative affective situations or using to cope. Surprisingly, there was little relationship between situational use scale scores and overall frequency of use of marijuana at baseline. Several studies in

the motives literature have found positive relationships between greater motives for use and overall frequency of use (e.g., Agrawal, et al., 2008; Cooper, 1994). The absence of relationships between situational use and overall frequency at baseline in this study may have been due to little variance in frequency of use in this dependent sample of users. The situational use scales at 4 months were consistently related to frequency of use at all follow-ups when there was greater variability in frequency of use.

Consistent with hypotheses and theory, negative affective use was negatively correlated with self-efficacy in psychologically distressing situations both at baseline and after treatment. Importantly, this finding was unique to negative affective use in analyses controlling for other types of situational use. Thus, there was evidence of situation specific self-efficacy. PDSE was uniquely and negatively related to outcomes at all follow-ups even when controlling for negative affective use. These findings lend support to the CBT model of treatment, which posits that learning situationally-specific coping responses can increase self-efficacy and affect outcomes from treatment (Marlatt & Gordon, 1985). There was also some support for the hypothesis that situationally-specific self-efficacy would interact with a tendency to use in those situations to further predict outcomes. A tendency to use in negative affective situations and self-efficacy for those situations significantly interacted to predict dependence symptoms at several time points. Individuals who tended to use more in negative affective situations and who had low PDSE had the highest number of marijuana dependence symptoms. As the figures illustrate, individuals who endorse low rates of negative affective use were unaffected by their self-efficacy in those situations, presumably because they use more frequently in other situations that are nonpsychologically-distressing.



This study appears to be the first to examine specific marijuana use situations both before and after treatment in a marijuana dependent, treatment-seeking, adult population. Further, it used both cross-sectional and prospective analyses to examine the relationships of different types of situational use with drug use outcomes. Findings that marijuana use in negative affect situations was particularly associated with psychological distress, maladaptive coping strategies, and more negative outcomes parallel research on the coping motive in relation to various drugs of abuse. Negative affective situational use as measured in the current study appeared to be a reasonable proxy for assessing the coping motive and may be a useful alternative for individuals who have difficulty discerning their own internal motives for use. Additional results showed that negative affective situational use changed during the course of treatment and was systematically related to self-efficacy for avoiding use in negative affect situations. The interaction of a tendency toward negative affect use and low self-efficacy for avoiding use in those situations was particularly problematic and reinforced the importance of targeting such use with specific coping skills interventions.

Several limitations should be noted. The self-selected convenience sample was limited in size and too small for a thorough psychometric study of the IMS measure. Further refinement of the IMS via both exploratory and confirmatory factor analytic studies would be useful to be sure that the measure was a reasonably comprehensive assessment of all relevant situations. Sample size decreased steadily throughout the follow-up process due to attrition, which may have compromised power to find relationships and the generalizability of results. The present paper was a secondary analysis of existing data and there were several aspects of the study that could have been

improved in order to lend greater support to the current analyses. First, certain questionnaires were only given at baseline (e.g., the COPE questionnaire), which made it difficult to determine the effect of treatment on coping strategies. Additionally, as there was no direct measure of motives given in the study, our conclusions regarding the usefulness of assessing situational use as a proxy for motives must be regarded as tentative pending future research. Nevertheless, the findings have important implications for the treatment of substance use disorders. Treatments that target use in negative affective situations and maladaptive coping strategies may be more effective than treatments that do not take into account use to cope with psychological distress. Treatments should both directly target the sources of negative affect and increase adaptive coping strategies when it occurs in order to improved outcomes.

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SITUATIONAL MARIJUANA USE

Table 1

*Inventory of Marijuana Situations Descriptive Statistics and Factor Loadings*

	Mean (Std. Dev.)	Negative Affective Use	Social Use	Positive Affective Use
1. When I was depressed about things in general	3.07 (0.81)	0.77		
3. When I had an argument with a friend, romantic partner, or spouse	2.43 (1.04)	0.66		
5. When I felt jumpy and physically tense	3.09 (0.85)	0.65		
9. When I felt sad	2.88 (0.92)	0.82		
13. When I was unhappy with my job	2.84 (1.11)	0.69		
17. When I felt empty inside	2.78 (1.02)	0.80		
19. When I was feeling lonely	2.73 (1.08)	0.74		
25. When I was angry	2.79 (0.97)	0.71		
29. When there were problems with people at work	2.33 (1.13)	0.66		
41. When I felt no one really cared what happened to me	2.30 (1.14)	0.75		

*(Table 1 continues)*

SITUATIONAL MARIJUANA USE

*(Table 1 continued)*

	Mean (Std. Dev.)	Negative Affective Use	Social Use	Positive Affective Use
2. When I met a friend and he/she suggested that we smoke pot together	3.35 (0.97)		0.88	
7. When I was relaxed with a friend and wanted to have a good time	3.17 (0.92)		0.77	
10. When I was at a party or out with friends and other people were smoking marijuana	3.32 (1.06)		0.88	
18. When someone in the same room was smoking marijuana	3.23 (1.08)		0.87	
34. When I was invited to someone's home and they offered me pot	3.34 (1.00)		0.87	
38. When I was having fun with friends and wanted to increase our enjoyment	2.89 (1.07)		0.75	
4. When I felt confident and relaxed	2.79 (0.85)			0.74
12. When everything was going well	3.13 (0.79)			0.84
20. When I felt satisfied with something I had done	2.78 (0.95)			0.74
28. When I was feeling content with my life	2.89 (0.88)			0.79

Table 2

*Descriptive Statistics for Predictors and Control Variables at Baseline and 4-Months*

	<b>Baseline</b>		<b>4-Months</b>	
	Mean	Std. Dev.	Mean	Std. Dev.
<u>IMS Scales</u>				
Negative Affective Use	2.73	0.75	1.83	0.80
Social Use	3.22	0.88	2.18	1.01
Positive Affective Use	2.90	0.71	1.96	0.85
<u>COPE Scales</u>				
Planning	2.56	0.70		
Active Coping	2.48	0.60		
Acceptance	2.70	0.53		
Substance Use	2.59	0.98		
Behavioral Disengagement	1.70	0.55		
Mental Disengagement	2.29	0.57		
<u>Situational Self-Efficacy</u>				
Psychologically Distressing Self-Efficacy	3.64	1.33	4.97	1.61
Nonpsychologically Distressing Self-Efficacy	2.68	1.19	4.13	1.63
<u>Outcome Variables</u>				
% Days Use During Last Five Weeks	0.78	0.24	0.36	0.38
Marijuana Problems	8.99	3.55	5.42	4.28
Marijuana Dependence Symptoms	5.72	1.13	2.78	2.09

SITUATIONAL MARIJUANA USE

Table 3

*Correlations Between IMS scales at Baseline and 4-Month Follow-Up*

	Negative Affective Use	Social Use	Positive Affective Use
Negative Affective Use		0.73**	0.77**
Social Situational Use	0.47**		0.82**
Positive Affective Use	0.46**	0.36**	

Note: correlations below diagonal are baseline to baseline, above diagonals are 4-month to 4-month

\*p < 0.05

\*\*p < 0.01

SITUATIONAL MARIJUANA USE

Table 4

*Correlations Between IMS, COPE subscales, and BSI*

	<b>Baseline COPE Subscales</b>						<b>BSI</b>
	Active	Planning	Acceptance	Substance Use	Behavioral Disengagement	Mental Disengagement	BSI - Baseline
<b>Baseline IMS</b>							
Negative Affective Use	-0.25*	-0.31**	0.06	0.41**	0.34**	0.21*	0.48**
Social Use	-0.14	-0.19	0.06	0.21	0.16	0.19	0.22*
Positive Affective Use	-0.04	-0.04	0.21	0.13	0.10	0.02	-0.01

\* p < 0.05

\*\*p < 0.01

Note: BSI is the Brief Symptom Inventory

SITUATIONAL MARIJUANA USE

Table 5

*Correlations Between Baseline IMS and Outcomes at Baseline and 4-Month Follow-Up*

	Baseline			4-Month Follow-Up		
	% days use	MPS	Dependence symptoms	% days use	MPS	Dependence symptoms
<b>Baseline IMS</b>						
Negative Affective Use	0.07	0.47**	0.34**	-0.02	0.26*	0.19
Social Use	-0.02	0.33**	0.17	-0.02	0.15	0.05
Positive Affective Use	0.07	0.08	0.21	0.06	0.28*	0.23*

\* p < 0.05

\*\* p < 0.01

Note: MPS is a count of marijuana problems

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Table 6

*Correlations Between 4-Month IMS and Outcomes at 4-, 10-, 16-, and 22-Month Follow-Ups*

	4-Months			10-Months			16-Months			22-Months		
	% days use	MPS	Dependence symptoms	% days use	MPS	Dependence symptoms	% days use	MPS	Dependence symptoms	% days use	MPS	Dependence symptoms
<b>4-Month IMS</b>												
Negative Affective Use	0.61**	0.77**	0.77**	0.36**	0.43**	0.49**	0.35**	0.29*	0.50**	0.32**	0.53**	0.34**
Social Use	0.55**	0.60**	0.62**	0.25*	0.34**	0.38**	0.32**	0.23	0.37**	0.22	0.42**	0.31**
Positive Affective Use	0.62**	0.67**	0.66**	0.41**	0.50**	0.53**	0.41**	0.27*	0.48**	0.29*	0.50**	0.38**

\* p < 0.05

\*\* p < 0.01

Note: MPS is a count of marijuana problems



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Table 7

*Regressions of IMS Subscales with Follow-Up Outcomes*

	Baseline			4-Month Follow-Up		
	% days use	MPS	Dependence symptoms	% days use	MPS	Dependence symptoms
<u>Baseline IMS:</u>						
Negative Affective Use	0.08	0.49**	0.32	-0.05	0.16	0.15
Social Use	-0.08	0.17	-0.00	0.03	- 0.00	- 0.01
Positive Affective Use	0.06	-0.21	0.06	0.09	0.20	0.19
R <sup>2</sup>	0.01	0.27**	0.12*	0.01	0.10*	0.07

\* p < 0.05

\*\* p < 0.01

Note: MPS is a count of marijuana problems

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Table 8

*Regressions of IMS Subscales with Follow-Up Outcomes, Continued*

	4-Month Follow-Up			10-Month Follow-Up			16-Month Follow-Up			22-Month Follow-Up		
	% days use	Dependence MPS	Dependence symptoms	% days use	Dependence MPS	Dependence symptoms	% days use	Dependence MPS	Dependence symptoms	% days use	Dependence MPS	Dependence symptoms
<b>4-Month IMS:</b>												
Negative												
Affective Use	0.30*	0.63**	0.62**	0.19	0.18	0.26	0.11	0.37*	0.37*	0.21	0.25	0.13
Social Use	-0.02	-0.04	0.07	-0.30	-0.25	-0.22	-0.07	-0.16	-0.07	-0.01	-0.08	-0.02
Positive												
Affective Use	0.38*	0.20	0.12	0.51*	0.57**	0.51*	0.38	0.33	0.28	0.11	0.16	0.30
R <sup>2</sup>	0.43**	0.60**	0.60**	0.20	0.27**	0.31**	0.18**	0.28**	0.31**	0.09	0.11	0.15*

\* p < 0.05

\*\* p < 0.01

Note: MPS is a count of marijuana problems

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Table 9

*Bivariate Correlations of IMS scales with Situational Self-Efficacy*

	<b>Bivariate Correlations</b>			
	<b>Baseline Self-Efficacy</b>		<b>4-Month Follow-Up Self-Efficacy</b>	
	PDSE	NPDSE	PDSE	NPDSE
<u>Baseline IMS:</u>				
Negative Affective Use	-0.26*	-0.07		
Social Use	-0.09	-0.19		
Positive Affective Use	-0.11	-0.14		
<u>4-Month IMS:</u>				
Negative Affective Use			-0.79**	-0.68**
Social Use			-0.64**	-0.73**
Positive Affective Use			-0.63**	-0.69**

PDSE: Self-Efficacy for Psychologically-Distressing Situations

NPDSE: Self-Efficacy for Nonpsychologically-Distressing Situations

\* p < 0.05

\*\* p < 0.01

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Table 10

*Regressions of IMS Subscales with Situational Self-Efficacy*

	Baseline Self-Efficacy		4-Month Follow-Up Self-Efficacy	
	PDSE	NPDSE	PDSE	NPDSE
<u>Baseline IMS:</u>				
Negative Affective Use	-0.28*	0.06		
Social Use	0.04	-0.18		
Positive Affective Use	0.00	-0.08		
R <sup>2</sup>	0.07	0.04		
<u>4-Month Follow-Up IMS:</u>				
Negative Affective Use			-0.73**	-0.25*
Social Use			-0.17	-0.42**
Positive Affective Use			0.07	-0.15
R <sup>2</sup>			0.62**	0.59**

PDSE: Self-Efficacy for Psychologically-Distressing Situations

NPDSE: Self-Efficacy for Nonpsychologically-Distressing Situations

\* p < 0.05

\*\* p < 0.01

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Table 11

*Regression Coefficients for the Interaction of IMS and Situational Self-Efficacy Predicting Outcomes*

	<b>4-Month Follow-Up</b>			<b>10-Month Follow-Up</b>			<b>16-Month Follow-Up</b>			<b>22-Month Follow-Up</b>		
	% days use	MPS	Dependence symptoms	% days use	MPS	Dependence symptoms	% days use	MPS	Dependence symptoms	% days use	MPS	Dependence symptoms
<u>Baseline</u>												
NA	-0.09	0.21	0.16									
PDSE	-0.31**	-0.25*	-0.24*									
NA x PDSE	-0.01	-0.18	-0.25*									
<u>4-Month Follow-Up</u>												
NA				-0.16	-0.03	0.03	-0.18	0.03	-0.01	-0.17	0.18	0.12
PDSE				-0.49**	-0.46**	-0.58**	-0.52**	-0.43**	-0.58**	-0.38**	-0.37**	-0.41**
NA x PDSE				0.02	-0.16	-0.21*	0.50	-0.44	-0.12	0.02	-0.14	-0.07

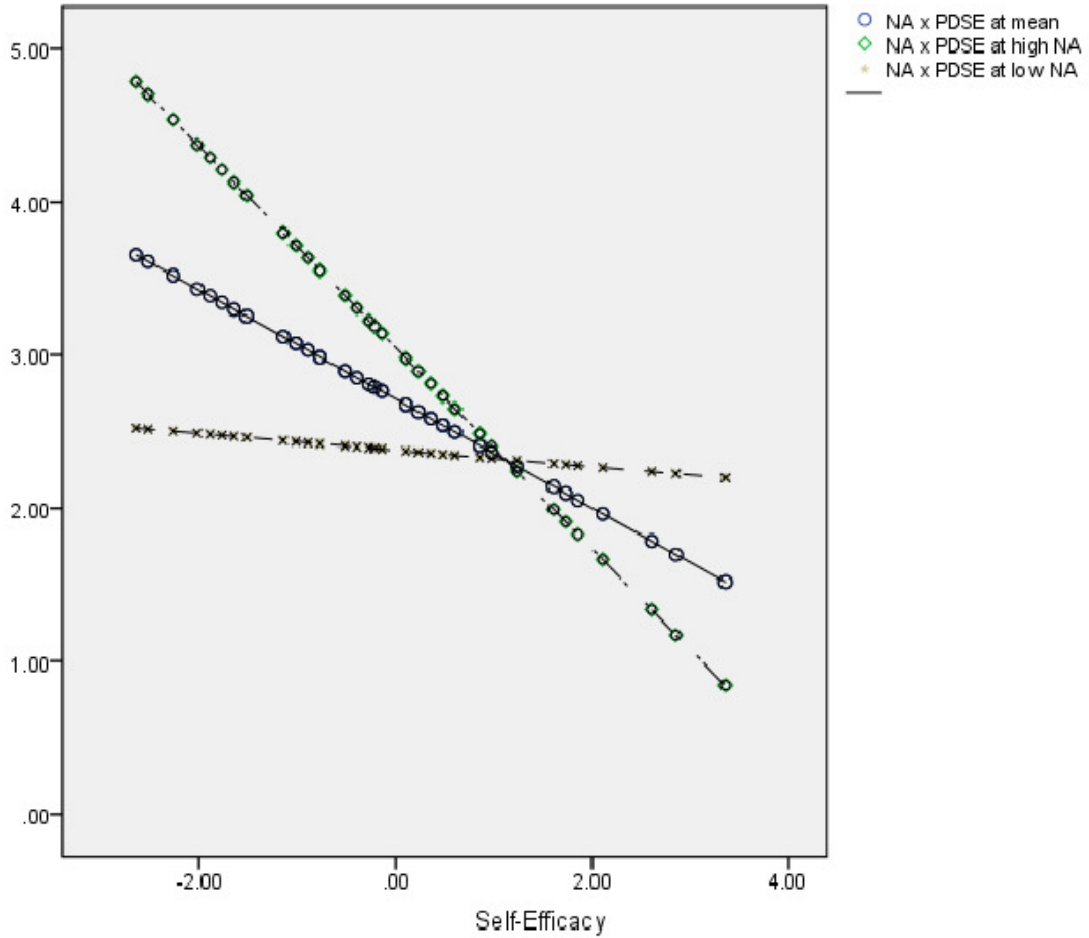
\*NA: Negative Affective Use; PDSE: self-efficacy for psychologically-distressing situations

\* p < 0.05

\*\* p < 0.01

Figure 1.

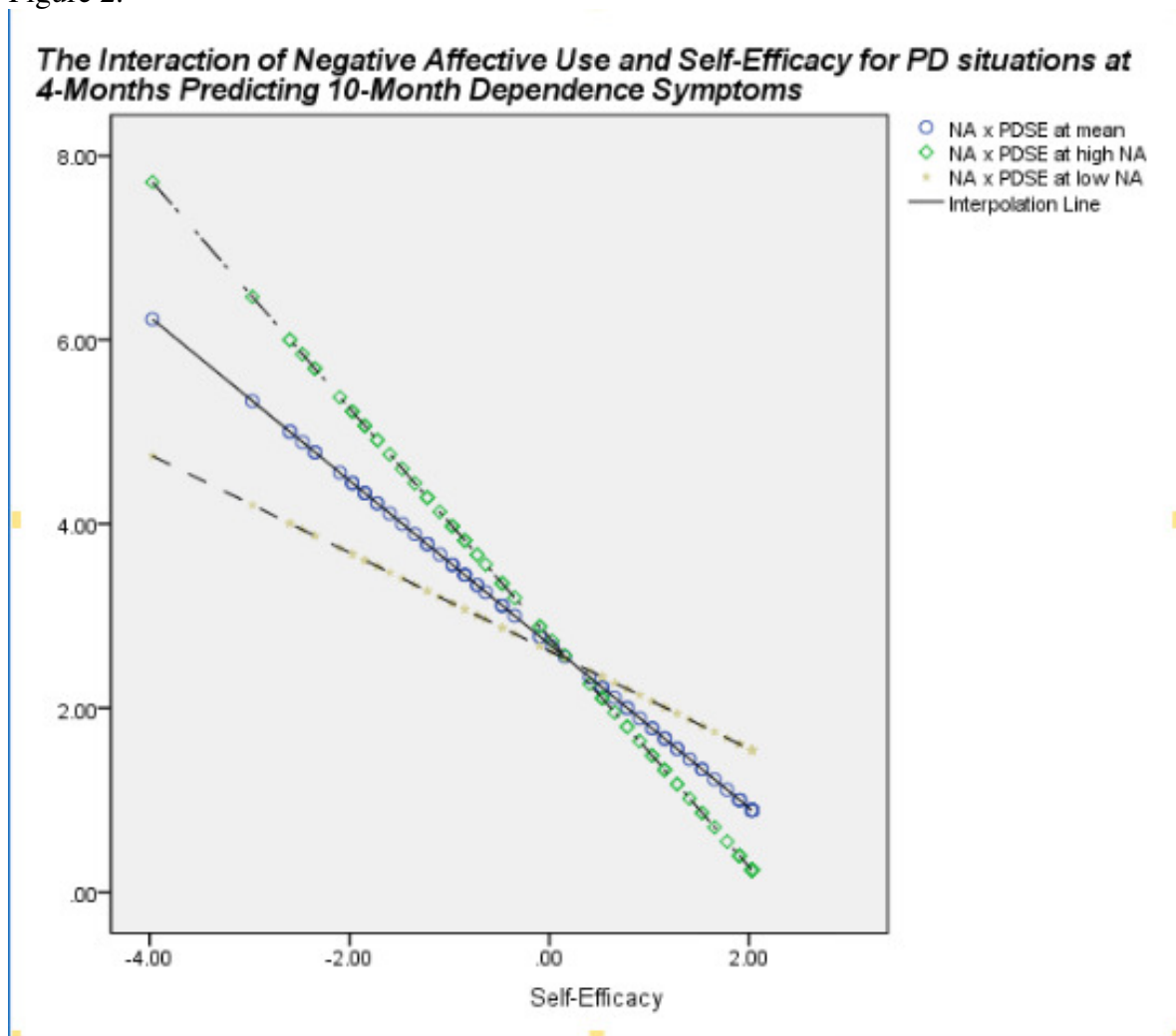
**The Interaction of Negative Affective Use and Self-Efficacy for PD situations at Baseline Predicting 4-Month Dependence Symptoms**



NA: Negative Affective Use

PDSE: Self-efficacy for psychologically distressing situations

Figure 2.



NA: Negative Affective Use

PDSE: Self-efficacy for psychologically distressing situations

**APPENDIX A: IMS**

**Instructions:** *The following statements are descriptions of different types of situations in which some people use marijuana. Please read each description carefully, and answer in terms of your own marijuana use over the **past 90 days**.*

*If you never used marijuana in that situation, circle “1”.*

*If you rarely used marijuana in that situation, circle “2”.*

*If you frequently used marijuana in that situation, circle “3”.*

*If you almost always used marijuana in that situation, circle “4”.*

	Never	Rarely	Frequently	Almost Always
<b>In the past 90 days I used marijuana:</b>				
1. When I was depressed about things in general.	1	2	3	4
2. When I met a friend and he/she suggested that we smoke pot together.	1	2	3	4
3. When I had an argument with a friend, romantic partner, or spouse.	1	2	3	4
4. When I felt confident and relaxed.	1	2	3	4
5. When I felt jumpy and physically tense.	1	2	3	4
6. When I unexpectedly found some pot.	1	2	3	4
7. When I was relaxed with a friend and wanted to have a good time.	1	2	3	4
8. When my job was too demanding.	1	2	3	4
9. When I felt sad.	1	2	3	4
10. When I was at a party or out with friends and other people were smoking marijuana.	1	2	3	4



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11. When a friendship or romantic relationship ended.	1	2	3	4
12. When everything was going well.	1	2	3	4
13. When I was unhappy with my job.	1	2	3	4
14. When I wanted to feel closer to someone I liked.	1	2	3	4
15. When I got some marijuana as a present.	1	2	3	4
16. When I had trouble sleeping.	1	2	3	4
17. When I felt empty inside.	1	2	3	4
18. When someone in the same room was smoking marijuana.	1	2	3	4
19. When I was feeling lonely.	1	2	3	4
20. When I felt satisfied with something I had done.	1	2	3	4
21. When pressure built up at work because of my supervisor or coworkers.	1	2	3	4
22. When I was having a good conversation with someone and wanted to tell some really good stories.	1	2	3	4
23. When I saw something that reminded me of smoking marijuana.	1	2	3	4
24. When I was tired.	1	2	3	4
25. When I was angry.	1	2	3	4
26. When I was offered a hit and felt awkward about refusing.	1	2	3	4

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27. When I felt sexually rejected.	1	2	3	4
28. When I was feeling content with my life.	1	2	3	4
29. When there were problems with people at work.	1	2	3	4
30. When I wanted to heighten my sexual enjoyment.	1	2	3	4
31. When I suddenly had an urge to smoke marijuana.	1	2	3	4
32. When I was in physical pain.	1	2	3	4
33. When I was bored.	1	2	3	4
34. When I was invited to someone's home and they offered me some pot.	1	2	3	4
35. When I felt jealous over something someone had done.	1	2	3	4
36. When I felt that things were going to work out for me at last.	1	2	3	4
37. When the atmosphere at work was really negative.	1	2	3	4
38. When I was having fun with friends and wanted to increase our enjoyment.	1	2	3	4
39. When I was in a situation in which I usually smoke marijuana.	1	2	3	4
40. When I felt nauseous.	1	2	3	4
41. When no one really cared what happened to me.	1	2	3	4

**APPENDIX B***Descriptive Statistics of IMS Dropped Items*

	Mean (Std. Dev.)	Reason for Drop
6. When I unexpectedly found some pot	3.03 (1.163)	Ambiguous valence
8. When my job was too demanding	2.30 (1.041)	Redundancy
11. When a friendship or romantic relationship ended	2.14 (1.268)	Low endorsement
14. When I wanted to feel closer to someone I liked	1.94 (0.957)	Low endorsement
15. When I got some marijuana as a present	2.70 (1.284)	Ambiguous valence
16. When I had some trouble sleeping	2.66 (1.055)	Not relevant to other scales
21. When pressure built up at work because of my supervisor or coworkers	2.44 (1.133)	Redundancy
22. When I was having a good conversation or wanted to tell some really good stories	1.88 (0.987)	Low endorsement
23. When I saw something that reminded me of smoking marijuana	2.41 (1.040)	Ambiguous valence
24. When I was tired	2.43 (0.936)	Not relevant to other scales
26. When I was offered a hit and felt awkward about refusing	2.23 (1.168)	Ambiguous valence
27. When I felt sexually rejected	1.80 (1.115)	Low endorsement

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30. When I wanted to heighten my sexual enjoyment	2.07 (1.097)	Low endorsement
31. When I suddenly had an urge to smoke marijuana	3.33 (.0773)	Ambiguous valence
32. When I was in physical pain	2.36 (1.110)	Not related to other scales
33. When I was bored	3.21 (0.809)	Ambiguous valence
35. When I felt jealous over something someone had done	1.76 (1.000)	Low endorsement
36. When I felt that things were going to work out for me at last	2.26 (1.051)	Ambiguous valence
37. When the atmosphere at work was really negative	2.39 (1.082)	Redundancy
39. When I was in a situation in which I usually smoke marijuana	3.74 (0.469)	Ambiguous valence
40. When I felt nauseous	2.27 (1.121)	Not related to other scales

## APPENDIX C: SSES

**Instructions:** Please rate how *confident* you would be that you could *resist* the temptation to smoke marijuana in the following situations.

“1” means you are not at all confident and “7” means you are extremely confident.

How confident are you that you could resist the temptation to smoke marijuana if you were:	Not at all Confident <span style="float: right;">Very Confident</span>						
1. Having to do some monotonous work.	1	2	3	4	5	6	7
2. Wanting to feel more confident.	1	2	3	4	5	6	7
3. On vacation.	1	2	3	4	5	6	7
4. Seeing someone else smoking marijuana and enjoying it.	1	2	3	4	5	6	7
5. Feeling depressed or worried.	1	2	3	4	5	6	7
6. Drinking alcohol.	1	2	3	4	5	6	7
7. Feeling like celebrating some good news or accomplishment.	1	2	3	4	5	6	7
8. Feeling frustrated.	1	2	3	4	5	6	7
9. Wanting to feel better about yourself.	1	2	3	4	5	6	7
10. Feeling angry about something or someone.	1	2	3	4	5	6	7
11. In a pleasant social situation.	1	2	3	4	5	6	7

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12. Having some time to yourself, free of responsibilities.	1	2	3	4	5	6	7
13. Using other drugs recreationally.	1	2	3	4	5	6	7
14. At a party where people were smoking marijuana.	1	2	3	4	5	6	7
15. Feeling embarrassed.	1	2	3	4	5	6	7
16. With a partner or close friend who was smoking marijuana.	1	2	3	4	5	6	7
17. In an uncomfortable social situation.	1	2	3	4	5	6	7
18. Offered marijuana by someone.	1	2	3	4	5	6	7
19. Bored with nothing to do.	1	2	3	4	5	6	7
20. Stressed out and needing to calm down.	1	2	3	4	5	6	7

## APPENDIX D: BSI

**Instructions:** *On the following pages is a list of problems and complaints that people sometimes have. Read each one carefully and indicate how much each problem has distressed or bothered you during the past 7 days, including today by circling the number after the statement. The numbers and their meanings are listed below.*

<b>During the past 7 days, how much were you distressed by:</b>	<b>Not At All</b>	<b>A Little Bit</b>	<b>Moderately</b>	<b>Quite A Bit</b>	<b>Extremely</b>
1. Nervousness or shakiness inside.	1	2	3	4	5
2. Faintness or dizziness.	1	2	3	4	5
3. The idea that someone else can control your thoughts.	1	2	3	4	5
4. Feeling others are to blame for most of your troubles.	1	2	3	4	5
5. Trouble remembering things.	1	2	3	4	5
6. Feeling easily annoyed or irritated.	1	2	3	4	5
7. Pains in your heart or chest.	1	2	3	4	5
8. Feeling afraid in open spaces.	1	2	3	4	5
9. Thoughts of ending your life.	1	2	3	4	5
10. Feeling that most people cannot be trusted.	1	2	3	4	5
11. Poor appetite.	1	2	3	4	5
12. Suddenly scared for no reason.	1	2	3	4	5
13. Temper outbursts that you could not control.	1	2	3	4	5

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14. Feeling lonely even when you are with people.	1	2	3	4	5
15. Feeling blocked in getting things done.	1	2	3	4	5
16. Feeling lonely.	1	2	3	4	5
17. Feeling blue.	1	2	3	4	5
18. Having no interest in things.	1	2	3	4	5
19. Feeling fearful.	1	2	3	4	5
20. Your feelings being easily hurt.	1	2	3	4	5
21. Feeling that people are unfriendly or dislike you.	1	2	3	4	5
22. Feeling inferior to others.	1	2	3	4	5
23. Nausea or upset stomach.	1	2	3	4	5
24. Feeling that you are being watched or talked about by others.	1	2	3	4	5
25. Trouble falling asleep.	1	2	3	4	5
26. Having to check and double-check what you do.	1	2	3	4	5
27. Difficulty making decisions.	1	2	3	4	5
28. Feeling afraid to travel on buses, subways, or trains.	1	2	3	4	5
29. Trouble getting your breath.	1	2	3	4	5
30. Hot or cold spells.	1	2	3	4	5
31. Having to avoid certain things, places, or activities because they frighten you.	1	2	3	4	5



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32. Your mind going blank.	1	2	3	4	5
33. Numbness or tingling in parts of your body.	1	2	3	4	5
34. The idea that you should be punished for your sins.	1	2	3	4	5
35. Feeling hopeless about the future.	1	2	3	4	5
36. Trouble concentrating.	1	2	3	4	5
37. Feeling weak in parts of your body.	1	2	3	4	5
38. Feeling tense or keyed up.	1	2	3	4	5
39. Thoughts of death or dying.	1	2	3	4	5
40. Having urges to beat, injure, or harm someone.	1	2	3	4	5
41. Having urges to break or smash things.	1	2	3	4	5
42. Feeling very self-conscious with others.	1	2	3	4	5
43. Feeling uneasy in crowds.	1	2	3	4	5
44. Never feeling close to another person.	1	2	3	4	5
45. Spells of terror or panic.	1	2	3	4	5
46. Getting into frequent arguments.	1	2	3	4	5
47. Feeling nervous when you are left alone.	1	2	3	4	5
48. Others not giving you proper credit for your achievements.	1	2	3	4	5

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49. Feeling so restless you couldn't sit still.	1	2	3	4	5
50. Feelings of worthlessness.	1	2	3	4	5
51. Feeling that people will take advantage of you if you let them.	1	2	3	4	5
52. Feelings of guilt.	1	2	3	4	5
53. The idea that something is wrong with your mind.	1	2	3	4	5

**APPENDIX E: COPE**

**Instruction:** *We are interested in how people respond when they confront difficult or stressful events in their lives. There are lots of ways to try to deal with stress. This questionnaire asks you to indicate what you generally do and feel, when you experience stressful events.*

*Obviously, different events bring out somewhat different responses, **but think about what you usually do when you are under a lot of stress.** Then respond to each of the following items by circling one number on your answer sheet for each, using the response choices listed just below.*

*Please try to respond to each item separately in your mind from each other item. Choose your answers thoughtfully, and make your answers as true FOR YOU as you can. Please answer every item. There are no "right" or "wrong" answers, so choose the most accurate answer for YOU--not what you think "most people" would say or do.*

<b>When I am under a lot of stress, usually...</b>	<b>Don't do this at all</b>	<b>Do this a little bit</b>	<b>Do this a medium amount</b>	<b>Do this a lot</b>
1. I try to grow as a person as a result of the experience.	1	2	3	4
2. I turn to work or other substitute activities to take my mind off things.	1	2	3	4
3. I get upset and let my emotions out.	1	2	3	4
4. I try to get advice from someone about what to do.	1	2	3	4
5. I concentrate my efforts on doing something about it.	1	2	3	4
6. I say to myself "this isn't real."	1	2	3	4
7. I put my trust in God.	1	2	3	4
8. I laugh about the situation.	1	2	3	4
9. I admit to myself that I can't deal with it, and quit trying.	1	2	3	4

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10. I restrain myself from doing anything too quickly.	1	2	3	4
11. I discuss my feelings with someone.	1	2	3	4
14. I talk to someone to find out more about the situation.	1	2	3	4
15. I keep myself from getting distracted by other thoughts or activities.	1	2	3	4
16. I daydream about things other than this.	1	2	3	4
17. I get upset, and am really aware of it.	1	2	3	4
18. I seek God's help.	1	2	3	4
19. I make a plan of action.	1	2	3	4
20. I make jokes about it.	1	2	3	4
21. I accept that this has happened and that it can't be changed.	1	2	3	4
22. I hold off doing anything about it until the situation permits.	1	2	3	4
23. I try to get emotional support from friends or relatives.	1	2	3	4
24. I just give up trying to reach my goal.	1	2	3	4
25. I take additional action to try to get rid of the problem.	1	2	3	4
26. I try to lose myself for a while by drinking alcohol or taking drugs.	1	2	3	4
27. I refuse to believe that it has happened.	1	2	3	4
28. I let my feelings out.	1	2	3	4

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29. I try to see it in a different light, to make it seem more positive.	1	2	3	4
30. I talk to someone who could do something concrete about the problem.	1	2	3	4
31. I sleep more than usual.	1	2	3	4
32. I try to come up with a strategy about what to do.	1	2	3	4
33. I focus on dealing with this problem, and if necessary let other things slide a little.	1	2	3	4
34. I get sympathy and understanding from someone.	1	2	3	4
35. I drink alcohol or take drugs, in order to think about it less.	1	2	3	4
36. I kid around about it.	1	2	3	4
37. I give up the attempt to get what I want.	1	2	3	4
38. I look for something good in what is happening.	1	2	3	4
39. I think about how I might best handle the problem.	1	2	3	4
40. I pretend that it hasn't really happened.	1	2	3	4
41. I make sure not to make matters worse by acting too soon.	1	2	3	4
42. I try hard to prevent other things from interfering with my efforts at dealing with this.	1	2	3	4
43. I go to movies or watch TV, to think about it less.	1	2	3	4
44. I accept the reality of the fact that it happened.	1	2	3	4

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45. I ask people who have had similar experiences what they did.	1	2	3	4
46. I feel a lot of emotional distress and I find myself expressing those feelings a lot.	1	2	3	4
47. I take direct action to get around the problem.	1	2	3	4
48. I try to find comfort in my religion.	1	2	3	4
49. I force myself to wait for the right time to do something.	1	2	3	4
50. I make fun of the situation.	1	2	3	4
51. I reduce the amount of effort I'm putting into solving the problem.	1	2	3	4
52. I talk to someone about how I feel.	1	2	3	4
53. I use alcohol or drugs to help me get through it.	1	2	3	4
54. I learn to live with it.	1	2	3	4
55. I put aside other activities in order to concentrate on this.	1	2	3	4
56. I think hard about what steps to take.	1	2	3	4
57. I act as though it hasn't even happened.	1	2	3	4
58. I do what has to be done, one step at a time.	1	2	3	4
59. I learn something from the experience.	1	2	3	4

**APPENDIX F: TLFB**

Anchor Date (past month): \_\_\_/\_\_\_/\_\_\_

**I would like to ask you a few more questions about your marijuana and alcohol use.**

1. **During the past month, on average, how much marijuana per week do you think you used in ounces?**

*(Probe by asking the participant, how many ounces he or she buys (or receives) per week or use boundary procedures to determine amount.)*

- \_\_\_ (1) Less than 1/16<sup>th</sup>
- \_\_\_ (2) 1/16<sup>th</sup>
- \_\_\_ (3) 1/8<sup>th</sup>
- \_\_\_ (4) 1/4<sup>th</sup>
- \_\_\_ (5) 3/8<sup>th</sup>
- \_\_\_ (6) 1/2
- \_\_\_ (7) 5/8<sup>th</sup>
- \_\_\_ (8) 3/4<sup>th</sup>
- \_\_\_ (9) 7/8<sup>th</sup>
- \_\_\_ (10) 1
- \_\_\_ (11) More than 1

2. **During the past month, on average, how much money did you spend per week on marijuana? \$ \_\_\_\_\_**

3. **During the past month, when you smoked, how many hours per day did you feel high on average? \_\_\_\_\_ hours**

4. **During the past month, on a typical day when you smoked, how many times per day did you get high on average (at least a 30 minute time interval is necessary to count as separate "times")?**  
\_\_\_\_\_ times

5. **During the past month, what was your typical source of marijuana (select one)?**

- \_\_\_ (1) I bought it
- \_\_\_ (2) I grew it myself
- \_\_\_ (3) I received it as a gift
- \_\_\_ (4) Other (please specify) \_\_\_\_\_

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6. **During the past month, what was your typical way of using marijuana (select one)?**

- (1) Smoked it in a joint
- (2) Smoked it in a pipe (or bong)
- (3) Consumed it orally
- (4) Other (please specify)\_\_\_\_\_

7. **During the past month, how many standard drinks did you have on a typical drinking day? \_\_\_\_\_ drinks**

*(Probe for number of standard drinks. Show the participant the “standard” drink measurements on the drug list)*

8. **During the past month, how many times did you have 6 or more drinks in a single day?**

- (0) Never
- (1) Less than weekly
- (2) Weekly
- (3) Less than daily
- (4) Daily or almost daily

9. **During the past month, how many cigarettes did you smoke on a typical day?**

- (0) None
- (1) Less than 10
- (2) About 1/2 pack
- (3) About 1 pack
- (4) More than a pack



**Marijuana Use History**

**I will be asking you a few questions about your marijuana use patterns since you first started using marijuana. The information you give me is confidential and will be used for research purposes only. It is very important that you give the most accurate answers. Of course, we recognize that some things will be difficult to recall so just give us your best estimate in those instances.**

**LIFETIME USE**

10) How old were you when you smoked marijuana for the first time? \_\_\_\_\_ years

11) At what age did you first smoke marijuana on a daily or a near daily basis? A daily or nearly daily basis, for our purposes, means that you smoked five or more days per week and you did it at that rate for at least a month? \_\_\_\_\_ years

12) Have you ever chosen to stop using marijuana for at least seven consecutive days? We are referring to times that you stopped not because you were in situations where you unable to get marijuana, or where there would have been serious legal consequences of your using, but rather purposefully stopped smoking. Some examples of situations where you might be unable to get marijuana include: being incarcerated or having no contact with a dealer. Some examples of situations where there would have been serious legal consequences include: if you were on parole or probation and subject to mandatory drug testing, if you were subject to mandatory drug testing for job-related reasons, or if you were hospitalized.

Code 0 = No 1 = Yes \_\_\_\_\_

*If No skip to number 14.*

*If Yes, Thinking back over your life, since the time you first began smoking on a daily*

*or near daily basis, how many times have you chosen to stop smoking marijuana*

*for at least seven days? \_\_\_\_\_ times*

*When was the last time you chose to stop smoking marijuana for at least seven days? \_\_\_\_/\_\_\_\_/\_\_\_\_ (date)*

13) What was the longest period that you purposefully chose to stop using marijuana since becoming a regular user? \_\_\_\_\_ days

14) **Have you ever chosen to significantly reduce your marijuana use for a period of at least seven days without actually completely quitting?**

Code 0 = No 1 = Yes \_\_\_\_\_

*If No, go to TUQ.*

*If Yes, How many times have you reduced your use for a period of at least seven days without actually stopping completely? \_\_\_\_\_ times*

**When was the last time you chose to reduce your use of marijuana for at least seven days? \_\_\_\_/\_\_\_\_/\_\_\_\_ (date)**

15) **What was the longest period of time during which you significantly reduced your use?**

\_\_\_\_\_ days

**We are interested in how you went about reducing your use. For instance, some people reduce the number of days on which they smoke marijuana, others reduce the number of times they smoke per day, and still others reduce how “high” they get when they smoke. Think of the time when you reduced your use for the longest period when I ask these next few questions.**

16 **Did you reduce the number of days on which you smoked marijuana, during the period of reduced use?**

Code 0 = No 1 = Yes \_\_\_\_\_

*If No, skip to number 17.*

*If Yes, How many days per week were you smoking marijuana during the period of reduced use? \_\_\_\_\_ days*

17) **Did you reduce the number of times you smoked per day?**

Code 0 = No 1 = Yes \_\_\_\_\_

*If No, skip to number 18.*

*If Yes, How many times per day did you smoke during your period of reduced use? \_\_\_\_\_ times*

SITUATIONAL MARIJUANA USE

18) **Did you restrict your use to certain times of the day during the period of reduced use?**

Code 0 = No 1 = Yes \_\_\_\_\_

If No, skip to number 20.

If Yes, **During what time periods during the day did you smoke during the period of reduced use?**

⌚ ⌚ <b>6 AM → 12 Noon</b> <b>Morning</b>	⌚ ⌚ <b>12 Noon → 6</b> <b>PM</b> <b>Afternoon</b>	⌚ ⌚ <b>6 PM → 12</b> <b>Midnight</b> <b>Evening</b>	⌚ ⌚ <b>12 Midnight 6 AM</b> <b>Night</b>
19a)	19b)	19c)	19d)

For items 19a to 19d code 0 = No 1 = Yes

20) **During this period of reduced use, did you reduce how “high” you got when you smoked?**

Code 0 = No 1 = Yes \_\_\_\_\_

If No, go to TUQ.

If Yes, **How did you go about reducing how “high” you got?** \_\_\_\_\_

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SITUATIONAL MARIJUANA USE

TLFB Calendar Anchor Date (90 days prior to baseline): \_\_\_/\_\_\_/\_\_\_

**TLFB Tally Form-Baseline**

<b>**FOR THE 90 DAYS PRIOR TO BASELINE**</b>								
<b>Week</b>	<b># of days in week</b>	<b># of Days of MJ use</b>	<b>MJ Uses Q1</b>	<b>MJ Uses Q2</b>	<b>MJ Uses Q3</b>	<b>MJ Uses Q4</b>	<b># Alcohol Uses</b>	<b># Drug Uses</b>
1								
2	7							
3	7							
4	7							
5	7							
6	7							
7	7							
8	7							
9	7							
10	7							
11	7							
12	7							
13	7							
14								
<b>Total</b>								



**APPENDIX G: MPS**

Following are different types of problems you may have experienced as a result of smoking **marijuana**. Please circle the number that indicates whether this has been a problem for you in the **past 90 days**.

<b>Has <u>Marijuana</u> use caused you:</b>	<b>No Problem</b>	<b>Minor Problem</b>	<b>Serious Problem</b>
1. Problems between you and your partner	0	1	2
2. Problems in your family	0	1	2
3. To neglect your family	0	1	2
4. Problems between you and your friends	0	1	2
5. To miss days at work or miss classes	0	1	2
6. To lose a job	0	1	2
7. To have lower productivity	0	1	2
8. Medical problems	0	1	2
9. Withdrawal symptoms	0	1	2
10. Blackouts or flashbacks	0	1	2
11. Memory loss	0	1	2
12. Difficulty sleeping	0	1	2
13. Financial difficulties	0	1	2
14. Legal problems	0	1	2
15. To have lower energy level	0	1	2
16. To feel bad about your use	0	1	2
17. Lowered self-esteem	0	1	2
18. To procrastinate	0	1	2
19. To lack self-confidence	0	1	2

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**APPENDIX G: SCID  
Marijuana Module**

\_\_\_\_/\_\_\_\_/\_\_\_\_ Anchor Date (**Looking at a calendar, place your finger on yesterday. Count back exactly 13 weeks staying on the same day of the week. When you get back 13 weeks, cross out (X) that day and the day after. The following day is your starting day for the 90-day period.**)

**Warm Up: Before we get started on some very specific questions regarding your marijuana use, why don't you tell me a little bit about your pot use?** (*probe, reflect, engage with potential participant*)

*Marijuana Abuse*

*A maladaptive pattern of marijuana use leading to clinically significant impairment or distress, as manifested by one (or more) of the following:*

**Now I am going to ask you several questions about your MJ use for the past 90 days, that is since (give anchor date).**

<p><b>(1) In the past 90 days have you missed work or school because you were high or very hung over? What about doing a bad job at work or failing courses at school because of your MJ use?</b></p> <p>(0) = No (1) = Yes</p> <p><i>IF NO, What about not keeping your house clean or not taking proper care of your children because of your use of MJ?</i></p> <p>(0) = No (1) = Yes</p> <p><b>IF YES TO EITHER, How often did this occur?</b></p> <p>_____ times</p>	<p>? 1 2 3</p>	<p><i>(1) Recurrent (2 or more times) marijuana use resulting in a failure to fulfill major role obligations at work, school, or home (e.g., repeated absences or poor work performance related to marijuana use; marijuana related absences, suspensions, or expulsions from school; neglect of children or household).</i></p>
	<p>Does mj use delay in getting household tasks done (2) vs. preventing them from being done at all (3)?</p>	

SITUATIONAL MARIJUANA USE

<p><b>(2) In the past 90 days, did you use MJ in a situation in which it might have been dangerous to be using it at all?</b></p> <p>(0) = No (1) = Yes</p> <p><b>(Did you drive while you were really too high to drive?)</b></p> <p>(0) = No (1) = Yes</p> <p><b>IF YES TO EITHER, How often did this occur?</b></p> <p>_____ times</p>	<p>? 1 2 3</p>	<p><i>(2) Recurrent (2 or more times) marijuana use in situations in which it is physically hazardous (e.g., driving any vehicle such as an automobile, motorcycle, boat, or operating dangerous equipment like a lawnmower, chain saw, stove, gun, tractor, snow cat, or even skiing, swimming, biking, or taking care of children, etc. when impaired by marijuana use).</i></p>
<p><b>(3) Has your use of MJ gotten you into trouble with the law during the past 90 days?</b></p> <p>(0) = No (1) = Yes</p> <p><b>IF YES, How often did this occur?</b></p> <p>_____ times</p>	<p>? 1 2 3</p>	<p><i>(3) Recurrent (2 or more times) marijuana-related legal problems (e.g., arrests for marijuana-related disorderly conduct).</i></p>



SITUATIONAL MARIJUANA USE

<p><b>(4) Has your use of MJ ever caused you problems with other people, such as with family members, friends, or people at work? (Have you gotten into physical fights or had bad arguments about your MJ use?</b></p> <p>(0) = No (1) = Yes</p> <p><b>IF YES, Have you experienced these problems during the past 90 days?</b></p> <p>(0) = No (1) = Yes</p> <p><b>IF YES, Did you keep on using MJ anyway?</b></p> <p>(0) = No (1) = Yes</p>	<p style="text-align: center;">?   1   2   3</p>	<p><i>(4) Continued use despite having persistent or recurrent social or interpersonal problems caused or exacerbated by the effects of the drug (e.g., arguments with spouse about consequences of intoxication, physical fights).</i></p>
<p><b>(5) RECORD THE TOTAL NUMBER OF ITEMS (1-4) CODED "3" FROM PREVIOUS SECTION FOR PAST 90 DAYS:</b></p>	<p><i>Code Abuse for the past 90 days.</i></p> <p><i>Total # "3's"</i></p> <p style="text-align: center;">_____</p>	<div style="border: 1px solid black; padding: 5px;"> <p>If no abuse item (1-4) is coded 3," go to next page.</p> <p>If 1 or more items (1-4) are coded as <b>"3,"</b> participant meets DSM-IV diagnosis of Marijuana Abuse.</p> <p style="text-align: center;">Go to next page.</p> </div>

SITUATIONAL MARIJUANA USE

Now I'm going to ask you some more specific questions about your use of MJ during the past 90 days.

<p><b>(6) During the past 90 days have you often found that when you started using MJ you ended up smoking much more of it than you were planning to?</b></p> <p>(0) = No (1) = Yes</p> <p><i>IF NO, What about using it over a much longer period of time than you were planning to?</i></p> <p>(0) = No (1) = Yes</p>	<p>? 1 2 3</p>	<p><i>(6) Marijuana often taken in larger amounts OR over a longer period of time than the person intended.</i></p>
<p><b>(7) During the past 90 days, did you try to cut down or stop using MJ?</b></p> <p>(0) = No (1) = Yes</p> <p><i>IF YES, During the past 90 days, did you actually ever cut down or stop using MJ altogether? (How many times did you try to cut down or stop altogether?)</i></p> <p>(0) = No (1) = Yes</p> <p><i>IF NO, Did you have a desire to cut down?</i></p> <p>(0) = No (1) = Yes</p> <p><i>IF YES, Is this something you kept worrying about?</i></p> <p>(0) = No (1) = Yes</p>	<p>? 1 2 3</p> <p>What were goals in cutting back/stopping? Were these goals met? Is ppt. happy with current level of use?</p>	<p><i>(7) Persistent desire or one or more unsuccessful attempts to cut down or control marijuana use.</i></p>

SITUATIONAL MARIJUANA USE

<p><b>(8) During the past 90 days did you spend a lot of time using MJ or doing whatever you had to do to get it?</b></p> <p>(0) = No (1) = Yes</p> <p><b>Did it take you a long time to get back to normal or recover from its effects the next day? (How much time? As long as several hours?)</b></p> <p>(0) = No (1) = Yes</p>	<p>? 1 2 3</p>	<p><i>(8) A great deal of time spent in activities necessary to get marijuana, spent focused on smoking marijuana or recovering from its effects.</i></p>
<p><b>(9) During the past 90 days did you use MJ so often that you used it instead of working or spending time at hobbies or with your family or friends?</b></p> <p>(0) = No (1) = Yes</p>	<p>? 1 2 3</p>	<p><i>(9) Important social, occupational, or recreational activities given up or reduced because of marijuana use.</i></p>

SITUATIONAL MARIJUANA USE

<p><b>(10) Has MJ ever caused you psychological problems, such as decreasing your motivation, making you depressed or anxious, decreasing your concentration or memory abilities?</b></p> <p>(0) = No (1) = Yes</p> <p><b>Has MJ ever caused you physical problems such as difficulty breathing, many colds, a chronic cough or made a physical problem worse?</b></p> <p>(0) = No (1) = Yes</p> <p><b>IF YES TO EITHER, Have you experienced these difficulties during the past 90 days?</b></p> <p>(0) = No (1) = Yes</p> <p><b>IF YES, Did you keep on using MJ anyway?</b></p> <p>(0) = No (1) = Yes</p>	<p style="text-align: center;">? 1 2 3</p> <p>Includes problems due to acute intoxication or chronic use</p>	<p><i>(10) Continued marijuana use despite knowledge of having a persistent or recurrent psychological or physical problem that is likely to have been caused or exacerbated by the use of marijuana (e.g., recurrent marijuana use despite recognition of smoking related cough).</i></p>
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<p><b>(11) Have you found that you currently (in the last 90 days) need to use a lot more MJ in order to get high than you did when you first started using it regularly (3 or more times a week)?</b></p> <p>(0) = No (1) = Yes</p> <p><b>IF YES, How much more?</b></p> <p><b>IF NO, What about finding that when you use the same amount now (in the past 90 days), it has much less effect than when you first started using regularly?</b></p> <p>(0) = No (1) = Yes</p>	<p>? 1 2 3</p> <p>Disregarding the differing quality and strength of mj, is the quantity you're using now more than when you started?</p>	<p><i>(11) Marked tolerance: need for markedly increased amounts of marijuana (at least 50% increase) in order to achieve intoxication or desired effect OR markedly diminished effect with continued use of the same amount.</i></p>
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SITUATIONAL MARIJUANA USE

<p><b>(12) During the past 90 days have you had withdrawal symptoms, that is, felt sick when you cut down or stopped using?</b></p> <p>(0) = No (1) = Yes</p> <p><b>IF YES, What symptoms did you have?</b></p> <p>1. _____</p> <p>2. _____</p> <p>3. _____</p> <p>4. _____</p> <p><b>IF NO, After not using MJ for a few hours or more have you often used it to keep yourself from getting sick (WITHDRAWAL SXS)?</b></p> <p>(0) = No (1) = Yes</p>	<p style="text-align: center;">? 1 2 3</p> <p>5. _____</p> <p>6. _____</p> <p>7. _____</p> <p>8. _____</p>	<p><i>(12) Characteristic withdrawal symptoms as manifested by either of the following:</i></p> <p><i>(a) the characteristic withdrawal syndrome for marijuana</i></p> <p><i>For MJ, withdrawal symptoms might include:</i></p> <ul style="list-style-type: none"> <li>• <i>Appetite disturbance</i></li> <li>• <i>Sleep disturbance (vivid dreams)</i></li> <li>• <i>Night sweats</i></li> <li>• <i>Headaches</i></li> <li>• <i>Irritability</i></li> <li>• <i>Restlessness</i></li> </ul> <p><i>(b) marijuana is taken to relieve or avoid withdrawal symptoms.</i></p>
<p><b>(13) RECORD THE TOTAL NUMBER OF ITEMS (6-12) CODED "3" FROM DEPENDENCE SECTION FOR THE PAST 90 DAYS.</b></p>	<p><i>Code Dependence for the past 90 days.</i></p> <p><i>Total # "3's"</i></p> <p style="text-align: center;">_____</p>	<div style="border: 1px solid black; padding: 5px; width: fit-content; margin: auto;"> <p>If 3 or more items (6-12) are coded as "3," participant meets DSM-IV diagnosis of Marijuana Dependence.</p> </div>

**APPENDIX H: PRN QUICK SCREEN SUMMARY FORM**

The column to the left marked "Include" should be checked if the caller meets the inclusion criteria. The right column "Exclude" should be checked if the caller should be excluded from the study.

<b>Criterion</b>	<b>Include (1)</b>	<b>Exclude (2)</b>
1) <b>At least 18 years old</b>		
2) <b>Has access to transportation and is within 60 miles of the research site.</b>		
3) <b>Has residential stability, not planning to move.</b> <ul style="list-style-type: none"> <li>• Callers who have no fixed address (e.g. live in halfway house or shelter) and will not be locatable within the next 12 months should be excluded.</li> <li>• Callers who are planning on moving out of the 60 mile radius of the research site within the next 12 months should be excluded.</li> </ul>		
4) <b>Has smoked cannabis on at least 50 of the past 90 days.</b>		
5) <b>Not dependent on alcohol.</b> <ul style="list-style-type: none"> <li>• Callers who drank 6 or more drinks per day on 10 or more of the last 30 days should be excluded.</li> </ul>		
6) <b>Not dependent on illicit drugs other than marijuana</b> <ul style="list-style-type: none"> <li>• Callers who have used any other drug on 10 or more of the past 30 days should be excluded.</li> </ul>		
7) <b>Not involved in <u>therapy or treatment</u> related to marijuana, alcohol, or other drug use in the past 30 days.</b>		
8) <b>Not involved in 12-Step meetings related to marijuana, alcohol, or other drug use in the past 30 days.</b> <ul style="list-style-type: none"> <li>• <b>Exception:</b> If caller attended <u>only 1 meeting</u> and is <u>definitely not planning to go back</u>, caller is eligible.</li> </ul>		
9) <b>Not currently enrolled in MCU2 or TMCU.</b>		
10) <b>Does not live with anyone enrolled in the project.</b>		
11) <b>No evidence of medical or psychiatric difficulties that may interfere with participation.</b>		

**APPENDIX I: Basic Demographic Sheet**

1. *Take a few minutes to engage in dialogue with the potential participant. Thanks so much for coming in. How did you find out about the MTP? (Check only one)*

Specific advertisement for MTP

- (1) The Stranger
- (2) The Seattle Weekly
- (3) KZOK
- (4) Other \_\_\_\_\_

Outreach

- (5) Flyer/Brochure (where picked up \_\_\_\_\_)
- (6) Event (specify \_\_\_\_\_)
- (7) Agency (specify \_\_\_\_\_)
- (8) Website (received address from \_\_\_\_\_)
- (9) Family/friend/relative
- (10) Medical doctor / Practitioner (non-MD) (specify \_\_\_\_\_)
- (11) Other
- (12) Don't Know

2. **What is your current employment status?** *If ppt has dual roles, ask which is primary and code 2a and 2b.*

**2a. Primary Role**

- (0) employed full time
- (1) employed part time
- (2) homemaker
- (3) full time student
- (4) part time student
- (5) unemployed
- (6) disabled and not working
- (7) self-employed
- (8) retired

**2b. Secondary Role (skip if no secondary role)**

- (0) employed full time
- (1) employed part time
- (2) homemaker
- (3) full time student
- (4) part time student
- (5) unemployed
- (6) disabled and not working
- (7) self-employed
- (8) retired

3. *If employed – How long have you been at your present job? (If less than two weeks code 0 months; If 3 to 4 weeks, code 1 month)*

\_\_\_\_ / \_\_\_\_ Years



SITUATIONAL MARIJUANA USE

\_\_\_\_/\_\_\_\_ Months

4. *If employed* – **Are you subject to drug testing at your workplace?**

- \_\_\_\_ (0) No
- \_\_\_\_ Yes  
*If yes, probe if*
- \_\_\_\_ (1) random screening
- \_\_\_\_ (2) targeted screening, Explain\_\_\_\_\_

5. **Are you planning to change your employment situation within the next twelve months?**

- \_\_\_\_ (0) No
- \_\_\_\_ (1) Yes, Explain (e.g., going to full-time or part-time, going back to school, quitting job)  
\_\_\_\_\_
- \_\_\_\_ (2) Don't know

6. **Do you currently have any legal problems such as being on probation or parole, awaiting sentencing, awaiting trial?**

- \_\_\_\_ (0) No
- \_\_\_\_ (1) Yes
- \_\_\_\_ (2) Don't Know

*If Yes, which one?*

- \_\_\_\_ On probation or parole (explain) \_\_\_\_\_
- \_\_\_\_ Awaiting sentencing (explain) \_\_\_\_\_
- \_\_\_\_ Awaiting trial (explain) \_\_\_\_\_

*If caller is on probation or parole ask the following:*

7. **Is mandatory drug testing a condition of your legal situation?**

- \_\_\_\_ (0) No
- \_\_\_\_ (1) Yes (explain) \_\_\_\_\_
- \_\_\_\_ (2) Don't Know

8. **Participation in the study requires that you be randomly assigned to one of the two conditions. Are you willing to be randomized?**

- \_\_\_\_ (0) No (Explain) \_\_\_\_\_
- \_\_\_\_ (1) Yes
- \_\_\_\_ (2) Don't Know (Explain) \_\_\_\_\_

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9. Does the individual seem fluent in English?

- \_\_\_ (0) No (Explain) \_\_\_\_\_
- \_\_\_ (1) Yes
- \_\_\_ (2) Not sure, could be a problem, (Explain) \_\_\_\_\_

10. **In the past 90 days have you used marijuana to treat a diagnosed medical or psychological condition?** (*Indicate that marijuana did not have to be prescribed, they simply have to use marijuana to cope with a diagnosed physical or psychological condition*)

- \_\_\_ (0) No (*If "No", end BDS here*)
- \_\_\_ (1) Yes (explain) \_\_\_\_\_

12. *If yes to #11,* **Has your physician given you signed and valid documentation for you to use marijuana to treat a diagnosed medical or psychological condition?**

- \_\_\_ (0) No
- \_\_\_ (1) Yes

13. *If no to #12,* **Will you be seeking valid documentation?**

- \_\_\_ (0) No
- \_\_\_ (1) Yes

## **APPENDIX J: Consent Form**

University of Washington  
School of Social Work

### **MARIJUANA TREATMENT PROJECT**

#### **Consent Form**

##### **Staff**

- Director: Dr. Roger Roffman, Professor, School of Social Work, 4101 15th Avenue N.E., Seattle, WA 98105, (206) 543-2312.
- Co-Director: Dr. Robert Stephens, Associate Professor, Department of Psychology, Virginia Tech, Blacksburg, VA 24060, (540) 231-6304.
- Enrollment and Assessment Coordinator: Wakana Tsuru, Innovative Programs Research Group, 909 N.E. 43d, Suite 304, Seattle, WA 98105. (206) 616-3740.
- Research Interviewers: Allison Howard and Becky Resnick, Innovative Programs Research Group, 909 N.E. 43d, Suite 304, Seattle, WA 98105. (206) 616-3740.
- Counselors: Candace Conte, Ernie McGarry, and Marc Redmon; Innovative Programs Research Group, 909 N.E. 43d, Suite 304, Seattle, WA 98105. (206) 616-3740.

##### **Researchers' Statement**

We are asking you to be in a research study. The purpose of this consent form is to give you the information you will need to help you decide whether or not to be in the study. Please read the form carefully. You may ask questions about the purpose of the research, what we would ask you to do, the possible risks and benefits, your rights as a volunteer, and anything else about the research or this form that is not clear. When all your questions have been answered, you can decide if you want to be in the study or not. This process is called "informed consent." We will give you a copy of this form for your records.

##### **Purpose and Benefits**

This project is for adults who wish to receive support in quitting marijuana use. We will evaluate two approaches to counseling, and we hope to learn how effective each of these

approaches is with 86 men and women such as you. Because we believe that both approaches will be helpful, by participating you may find that the experience will assist you in abstaining from marijuana.

### Procedures

There are three steps for participants in the Marijuana Treatment Project:

**The 1st Step: Initial Assessment.** If you agree to participate, the first step is an Initial Assessment that starts today. We will ask you questions about your background and about particular experiences you may or may not have had with marijuana, alcohol, and other drugs. Your responses will help us know whether our project is right for you and whether you are eligible to participate. This will take between 20 and 40 minutes.

If you are eligible and decide to participate, we will ask you to complete a questionnaire at home. Completing the questionnaire will take about 30 to 60 minutes.

We'll ask you to return to this office about a week from now and bring the questionnaires you completed at home. We will ask you more questions about your marijuana, alcohol, and other drug use; the positive and negative experiences you may have had in using marijuana and other substances; and attitudes you might have concerning future marijuana use. Because some of these questions will focus on illegal drug use (example: "How many times have you smoked marijuana in the last 30 days?"), they will be personal and sensitive. However, you are free not to answer any questions you do not wish to answer. That visit will take about one hour.

**The 2d Step: Counseling.** The second step involves counseling. You will be assigned to one of two possibilities. We'll make this assignment randomly (like flipping a coin).

Both of these possibilities are aimed at increasing your motivation, teaching you skills to achieve abstinence and cope with problems related to quitting marijuana use, and helping you to identify and make use of helpful community resources.

The two possibilities are:

- Meeting with a counselor for nine individual 60-90 minute sessions over a 12-week period.

or

- Meeting with a counselor for four individual 60-90 minute sessions over a 4-week period, and having the opportunity to return for brief periods of counseling, if necessary.

**The 3d Step: Follow-Up Assessment Interviews.** To help us evaluate the Marijuana Treatment Project, we'll schedule you to return for Follow-Up Assessment Interviews 4, 10, 16, 22, 28, and 34 months from now. Each of these interviews will last about 1½ hours and we will pay you \$50 for completing each one. We will again ask numerous questions about your marijuana and other drug use, as well as attitudes about the future. In summary, your total period of involvement with our project will be about 3 years.

**Urine Tests.** As part of the research evaluation, you will be asked to give samples of your urine to verify your reports regarding drug use. The first time you'll be asked to do this will be at your next visit. Then, you'll be asked to submit urine samples at each Follow-Up Assessment Interview (4, 10, 16, 22, 28, and 34 months from now). Urine samples will be tested for the presence of: amphetamines, barbiturates, benzodiazepines, cocaine, marijuana, methadone, methaqualone, opiates, phencyclidine, and propoxyphene.

**Collateral.** We will ask you to seek the permission from someone who knows you closely (such as a family member or friend) to be interviewed by us now (by telephone or by a mailed questionnaire) and at about the same time you're coming in for your Follow-Up Assessment Interviews. This person, called a Collateral, will be asked to describe what they know about your recent use (or non-use) of marijuana, alcohol, and other drugs. What your Collateral tells us will be kept confidential and won't be shared by us with you.

**Videotaping.** We ask that you grant us permission to videotape both your assessment and counseling sessions. The camera will be aimed only at our staff member, and your image will not be recorded. These tapes will not be stored with your name on them, and they will be kept in locked storage cabinets. The purpose of the videotapes is to assist us in determining the consistency of our planned services with each participant. The tapes will be erased within six years of today's date. Only members of this project's staff will have access to these tapes.

### **Risks, Stress, or Discomfort**

Because we will be asking you personal questions about activities that are illegal, and because we will be testing your urine, it would be risky to you if the information you share with us or the results of your urine tests were disclosed to outsiders.

However, we have taken several steps to make certain that this does not happen: (1) our staff members have pledged in writing to maintain confidentiality of everything told to us; (2) your questionnaire and interview responses will be filed separately from your name; (3) all questionnaires will be stored in locked filing cabinets; (4) all information about you that is entered in computers will be protected by passwords known only to our staff; and (5) your urine specimens will not have your name attached to them.

To help us protect your privacy, we have obtained a Certificate of Confidentiality from the National Institutes of Health. With this Certificate, we cannot be forced to disclose information that may identify you, even by a court subpoena, in any federal, state, or local civil, criminal, administrative, legislative, or other proceedings. We will use the

## SITUATIONAL MARIJUANA USE

Certificate to resist any demands for information that would identify you, except as explained below.

The Certificate cannot be used to resist a demand for information from personnel of the United States Government that is used for auditing or evaluation of Federally funded projects or for information that must be disclosed in order to meet the requirements of the federal Food and Drug Administration (FDA).

You should understand that a Certificate of Confidentiality does not prevent you or a member of your family from voluntarily releasing information about yourself or your involvement in this research. If an insurer, employer, or other person obtains your written consent to receive research information, then we may not use the Certificate to withhold that information.

The Certificate of Confidentiality does not prevent us from disclosing voluntarily, without your consent, information that would identify you as a participant in the research project under the following circumstances: (a) if you are abusing or neglecting your child(ren) or an elderly adult; (b) if you are a danger to yourself or others.

It might be stressful to answer questions about illegal drug use and your intentions about that in the future. However, we will do our best to ask questions in a sensitive manner.

### **Other Information**

The information that you provide us will be treated confidentially, and only members of the project staff will have access to information that could identify you.

We will use this information to prepare articles for publication. No participant will be identified by name in these articles. We will destroy any identifying information you provide to us within six years from today's date. Urine samples will be discarded following testing.

**Helping Us To Find You.** You will be asked to provide the name of a person ("locator") who will know your whereabouts over the next three years so that they may help us locate you if you change your address without notice. If no one knows your whereabouts, public information sources, such as telephone directories, motor vehicle records, or public access locator services may be used to locate you.

**Payments for Your Time.** No payment is offered for the Initial Assessment or the meetings you will have with your counselor. As noted above, we will pay you \$50 for your time and effort in completing each of Follow-Up Assessment Interviews 4, 10, 16, 22, 28, and 34 months from now. Thus, if you complete all six Follow-Up Assessment Interviews, we will pay you a total of \$300.

You may refuse to participate or may withdraw from the study at any time without penalty or loss of benefits to which you are otherwise entitled.

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Signature of investigator                      Date

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Typed or printed name of investigator

**Participant's Statement**

This study has been explained to me. I volunteer to take part in this research. I have had a chance to ask questions. If I have questions later about the research, I can ask one of the researchers listed above. If I have questions about my rights as a research subject, I can call the Human Subjects Division of the University of Washington at (206) 543-0098 or Virginia Tech at (540) 231-4991. I will receive a copy of this consent form.

I (do) (do not) consent to the videotaping of my assessment interviews and intervention sessions.

I (do) (do not) consent to the audiotaping of my assessment interviews and intervention sessions.

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Printed name of participant

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Signature of participant                      Date