

Psychological Distress and Marijuana Use Before and After Treatment: Testing Cognitive-  
Behavioral Hypotheses

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## Abstract

Adult marijuana users seeking treatment ( $N = 291$ ) were randomly assigned to 3 treatment conditions: 1) a cognitive-behavioral relapse prevention support group (RPSG), 2) individualized assessment and advice group, and 3) delayed treatment control group. The purpose of this study was to examine the relationship between psychological distress, self-efficacy, and marijuana use. Measures of marijuana use, psychological distress, situational self-efficacy, coping self-efficacy, temptation to use, and frequency of encountering situations were used. Only a portion of the hypotheses were supported. Psychologically distressed individuals had lower self-efficacy for psychologically distressing (PD) situations as opposed to non-psychologically distressing (NPD) situations. Participants had lower self-efficacy for NPD situations than PD situations. The RPSG condition did not have the hypothesized effect on self-efficacy for PD situations.

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## Psychological Distress and Marijuana Use Before and After Treatment: Testing Cognitive-Behavioral Hypotheses

Several studies note the epidemiology of comorbid drug use and psychological distress (Anthony and Helzer, 1991; Kessler, Nelson, McGonagle, Edlund, Frank and Leaf, 1996; Grant, 1995). Many theories have been proposed in order to explain the relationship between psychological distress and drug use. The self-medication hypothesis postulates that some individuals are predisposed to addiction because they suffer from negative affective states and psychological distress (Khantzian, 1985). Tension reduction theory (TRT) posits that individuals who are sensitive to stress are more likely to use drugs or alcohol in order to cope than people who are not experiencing high levels of tension or stress (Greeley and Oei, 1999). Cognitive-behavioral models focus on the use of drugs to cope with negative affective states and the need to acquire alternative coping skills in order to reduce the likelihood of drug use (Marlatt and Gordon, 1985). Marijuana is one of the most frequently used illicit drugs in the United States (Hall, Johnston, and Donnelly, 1999) and it has been noted that the psychological effects of marijuana include anxiety reduction, sedation, and euphoria (Watson, Benson, and Joy, 2000). Yet, only recently have investigators become interested in the link between psychological distress and marijuana use (Simons and Carey, 2002). This paper will investigate the relationship between psychological distress and marijuana use before and after treatment in a sample of marijuana dependent adults.

The Epidemiological Catchment Area study (ECA) found that rates of affective disorders were between 3.5 and 10.7 times higher in people suffering from drug use disorders (Anthony and Helzer, 1991). The National Comorbidity Survey (NCS) found that comorbidity between drug abuse and dependence disorders and affective disorders ranged between 28% and 39% (Kessler et al., 1996). Collectively, these epidemiological studies show that a large part of the population that suffers from psychological distress also suffers from substance use disorders. Regarding marijuana specifically, Degenhardt, Hall, and Lynskey (2001) found a positive correlation between cannabis use and DSM-IV affective and anxiety disorders in an Australian National Survey of Mental Health and Well Being. In a longitudinal study beginning with sixth graders from an entire city school district, Milich et al. (2000) found that internalizing and externalizing disorders in the 6<sup>th</sup> grade were predictive of frequent marijuana use at age 20.

Several treatment studies have found high comorbidity between psychological distress and substance use disorders (Caetano and Weisner, 1995; Clayton, 1986; Newcomb, Vargas-Carmona, and Galaif, 1999; Ross, Glaser, and Germanson, 1988; Limbeck, Wouters, Kaplan, Geerlings, and Alem, 1992; Kleinman et al., 1990). Copeland, Swift, and Rees (2001) found a great deal of comorbid psychological distress with marijuana dependent treatment seeking adults (84.5% of men and 77% of women) and reported that the most commonly cited reasons for cannabis use was stress relief. Similarly, Stephens, Roffman, and Simpson (1993) reported that a significant portion of marijuana dependent adults who were seeking treatment had clinically elevated levels of psychological distress. Further, after treatment negative emotional states were the most frequently cited reason for relapse to marijuana use (Stephens, Curtin, Simpson, and Roffman, 1994). In a recent study by Simons and Carey (2002), undergraduate marijuana users completed a series of self-report questionnaires that included measures of marijuana use, marijuana related problems and psychological distress/affect deregulation. Findings of the study show that psychological distress or affect dysregulation and substance use behaviors are positively correlated with one another.

It appears that the presence of psychological distress is positively related to drug use and that marijuana use disorders are often comorbid with psychological distress. Although the direction of the effect between psychological distress and drug use is not always clear, several studies support the notion that negative affect precedes drug use as evidenced by statements that marijuana is used in order to cope when psychological distress is experienced. Additionally, longitudinal studies with adolescents have found that psychological distress precedes drug use, offering support that drug use sometimes occurs as a symptom rather than a cause of psychological distress (Tschann, Alder, Irwin, Millstein, Turner, and Kegeles, 1994; Shedler and Block, 1990).

One theory that attempts to explain the reasons why people engage in drug use is Khantzian's self-medication hypothesis (Khantzian, 1985). This theory states that drugs that addicts choose to use are not selected randomly, but rather the drug of choice is the result of the interaction between the drugs psychopharmacological action and the type of psychological distress that is present. Khantzian's hypothesis leads to the conclusion that people suffering from psychological distress and negative affect states may be more susceptible to use drugs or alcohol as a way of self-medicating their distress when compared to people who are not suffering from

such distress. Laboratory studies have found mixed results regarding the hypothesis that drug of choice is specific to the type of psychological distress experienced (Chutuape and de Wit, 1995; Castaneda, 1994; Khantzian, 1985). However, most drugs of abuse have the common effect of increasing dopamine in the brain that leads to positive reward feelings (Blum et al., 2000). This would explain Weiss, Griffin, and Mirin's (1992) finding that people often used drugs in order to improve their mood regardless of the type of drug. The self-medication hypothesis may be overly specific by stating that people with different types of psychological distress will search out the drug that will relieve them of their specific type of psychological distress.

Another theoretical formulation that is often offered when discussing reasons for drug and alcohol use is the tension-reduction theory (TRT). The tension reduction hypothesis views the use of drugs of abuse as functional behavior aimed at reducing tension and stress (Greeley and Oei, 1999; Colder, 2001). The model, which has mainly been tested in alcohol studies, postulates that drinking or drug use can reduce tension and people learn to use drugs and/or alcohol to avoid or reduce unpleasant stress. The literature to date on the topic of tension reduction theory has mixed findings (Corcoran 1994; Brady and Lydiard, 1993; Young, Oei, and Knight, 1990; Kalodner, Delucia, and Ursprung, 1989, Cappell and Greeley, 1987; Higgins and Marlatt, 1975). It may be that constructs such as self-efficacy for coping or different expectancies for drug effects moderate the relationship between psychological distress and use.

CBT theorists come from a social learning perspective that addictive behaviors are bad habits or maladaptive coping strategies that the drug users have developed over time (Marlatt and Gordon, 1985; Longabaugh and Morgenstern, 1999; Monti, Kadden, Rohsenow, Cooney, and Abrams, 2002). Many addictive behaviors, especially drug use, result in the experience of immediate gratification that may include relief of stress. In contrast, the negative consequences of the drug use are delayed and therefore not immediately focused on by drug users. A central tenet of social learning explanations of substance abuse is that the immediate reinforcing effects of substance use may interact with psychological or behavioral coping deficits in certain individuals to produce escalation of substance use and eventually dependence (Maisto, Carey, and Bradizza, 1999; Abrams and Niaura, 1987). This perspective makes predictions similar to the self-medication hypothesis when individuals with chronic psychological distress are considered. The psychological distress leads individuals to search for ways to cope and relieve their distress and, if substance use has worked in the past to relieve these negative affect states, it

may be relied on in the future. It has been found, for instance, that negative affect is one of the most common precipitants to relapse to drug abuse (Marlatt and Gordon, 1985), including relapse to marijuana (Stephens et al., 1994).

Individuals who have learned to use marijuana as a way of coping and have therefore not developed more positive ways of coping are thought to have chronic coping deficits that create a cycle of distress and use that is repeatedly reinforced by marijuana's distress alleviating effects. CBT postulates that new, positive coping skills can be learned in order to help people deal with psychologically distressing situations that in turn should increase self-efficacy for avoiding substance use in distressing situations in the future. CBT has been found to be efficacious in the treatment of a variety of substance problems (Stephens, Roffman, and Curtin, 2000; Carroll, 1999, Project Match, 1997; Stephens, Wertz, and Roffman, 1995) although it has not always been clear that its effects were mediated by increases in coping skills (Morgenstern and Longabaugh, 2000). These studies have not looked specifically at how the acquisition of coping skills contributes to treatment outcomes. Kadden, Cooney, Getter, and Litt (1989) found that coping skills therapy was more effective than a more interpersonally based interactional therapy for people with alcohol dependence and higher levels of psychological distress. Therefore it is possible that the effect of treatment on those in with high levels of psychological distress is mediated by the acquisition of coping skills for coping with psychological distress, and in turn the increase in self-efficacy that results from being able to use positive coping strategies.

In this paper the role of psychological distress and marijuana use was examined in a population of treatment seeking adults. A cognitive behavioral relapse prevention therapy (RPSG), that has shown to be effective in decreasing marijuana use (Stephens et al., 2000), was compared to an assessment and advice (IAI) and a delayed treatment control (DTC) condition. The data for this study were originally collected in order to examine the differential effects of the treatment conditions on marijuana cessation. The current investigator used the existing data to examine hypotheses related to the role of psychological distress in marijuana treatment. Stephens et al. (2000) found that both the RPSG and IAI treatment conditions were effective at reducing marijuana use at the 4-month follow-up compared to the DTC condition. Additionally, while the two treatment conditions were effective at reducing marijuana use, there were no significant differences between the RSPG and IAI conditions on outcomes at any of the follow-ups.



However, hypotheses involving the role of psychological distress in reductions of marijuana had not been examined prior to the current study.

### Hypotheses

In the present paper, the relationships between self-efficacy, psychological distress, and marijuana use were examined in a sample of adult marijuana users who received treatment to help them stop using. The following hypotheses are offered:

- 1) Prior to treatment, individuals who report clinically significant levels of psychological distress will report less confidence in resisting marijuana use and using coping skills in psychologically distressing situations than in non-psychologically distressing situations.
  - Corollary 1: Prior to treatment, individuals who report clinically significant levels of psychological distress will be more tempted to use marijuana in psychologically distressing situations compared to non-psychologically distressing situations.
- 2) Prior to treatment, individuals that experience clinically significant levels of psychological distress will be less confident about their ability to resist marijuana in psychologically distressing situations than those who experience lower levels of psychological distress.
  - Corollary 1: Prior to treatment, individuals who report clinically significant levels of psychological distress will encounter negative mood states more often than those with lower levels of psychological distress.
  - Corollary 2: Prior to treatment, individuals who report clinically significant levels of psychological distress will be more tempted to use marijuana when they encounter negative mood states than those who report lower levels of psychological distress.
- 3) Participation in cognitive-behavioral treatment, rather than motivational enhancement therapy or a delayed treatment control condition, will have a greater positive effect on self-efficacy in psychologically distressing situations, and therefore reductions in overall marijuana use, for individuals with clinically significant levels of psychological distress compared to individuals with lower levels of psychological distress.

- Corollary 1: After participation in cognitive-behavioral treatment, increased self-efficacy and coping will lead to lower reports of encountering negative affect situations. This effect will be greater for individuals who reported clinically significant levels of psychological distress prior to treatment than for those who reported lower levels of psychological distress prior to treatment.
- Corollary 2: After participation in cognitive-behavioral treatment, increased self-efficacy and coping will lead to lower rates of feeling tempted to use in negative affect situations. This effect will be greater for individuals who reported clinically significant levels of psychological distress prior to treatment than for those who reported lower levels of psychological distress prior to treatment.

## **Method**

### ***Participants***

Participants were recruited for this study through news stories, media announcements, and paid advertisements on radio stations in the greater Seattle, Washington area. The National Institute on Drug Abuse Grant 2 R01 DA03586-04 supported this research. Two-hundred ninety-one adult marijuana users out of the 601 that were screened and seeking treatment for their marijuana use were enrolled in a study that examined differences in treatment outcome between an extended 14-session cognitive behavioral group treatment and a brief individual 2-session treatment using motivational interviewing techniques. Eligibility for the actual study was determined based upon self-report measures. Eligible participants had smoked 50 times or more in the last 90 days, had not abused alcohol or other drugs in the last 90 days, did not report severe psychological distress, were not involved in other formal treatment for marijuana abuse, and completed the pretreatment research protocol and assessment procedures. Of the 601 potential participants that were screened 24 were ineligible because they had not smoked at least 50 out of the last 90 days, 149 participants had abused alcohol or other drugs in the previous 90 days, 8 reported severe psychological distress and 2 were involved in other formal treatments for marijuana use. Of the 418 participants that were eligible after screening, 127 were excluded because they did not complete the pretreatment assessment.

This paper focuses on the 291 who met all eligibility criteria, completed the pretreatment assessment, and were randomly assigned to treatment (see Stephens and colleagues (2000) for a more complete report of the study methodology and analyses focused on treatment efficacy in

the full sample). They were mainly Caucasian (95%), male (77%), employed full time (76%), and single (55%). The sample had a mean age of 34 ( $SD = 6.85$ ) years. Table 1 contains baseline means and standard deviations on measures of marijuana use, psychological distress, self-efficacy, coping and temptation to use.

In order to examine whether random assignment to treatment condition was successful and to determine that participants did not complete the 4-month follow-up differentially by condition, 3 (Condition: RPSG vs. IAI vs. DTC)  $\times$  2 (Follow-up Attendance Status: Yes vs. No) univariate ANOVAs were conducted on continuous demographic and dependent measures. Comparable chi-square analyses were conducted on categorical demographic variables. Demographic variables included sex, age, race, highest degree earned, marital status, employment status, and legal status. Dependent measures included marijuana use information, and mean scale scores on the dependent and independent variables in Table 1. No differences by Condition or by Attendance Status were found for any of the demographic or dependent variables except for those mentioned in the following paragraphs.

For the demographic variables, significant differences were found among participants who did not attend the follow-up in the areas of education level and legal status. For level of education completed there was a significant difference ( $\chi^2 (1, n = 41) = 3.94, p < .05$ ) indicating that participants who did not attend follow-up (14.2%) were less likely to have completed post-high school education (10.4%). For legal status there was a significant difference ( $\chi^2 (1, n = 42) = 5.34, p < .05$ ) indicating that more of the participants who did not attend the follow-up (14.5%) were dealing with legal problems (12.8%).

For frequency of marijuana use there was a significant difference ( $F (1, 285) = 4.48, p < .05$ ) for people who did attend follow up ( $M = 73.62, SD = 19.31$ ) and those who did not ( $M = 80.69, SD = 11.48$ ) with people who did not attend smoking marijuana on significantly more during the 90 days prior to baseline.

For the TQ-PD there was a significant interaction for Condition by Attendance Status ( $F (2, 285) = 7.92, p < .05$ ) and a main effect for Condition ( $F (2, 285) = 4.32, p < .05$ ). Because the interaction was found a series of univariate ANOVA's were conducted separately for each of the treatment conditions. It was found that only the difference for the IAI condition was significant ( $F (1, 86) = 11.86, p < .05$ ) where those who did not attend the follow-up were less tempted ( $M = 2.16, SD = 1.07$ ) by PD situations at baseline than those who attended ( $M = 3.61, SD = 1.44$ ). ).

For the TQ-NPD there was also a significant interaction for Condition by Attendance Status ( $F(2, 285) = 3.14, p < .05$ ). It was found that only the difference for the IAI condition was significant ( $F(1, 86) = 4.25, p < .05$ ). Again those who did not attend the follow-up in the IAI condition were less tempted ( $M = 4.74, SD = 1.47$ ) by NPD situation than those who did attend ( $M = 5.50, SD = 1.18$ ).

### ***Design***

Participants were randomly assigned to one of the two treatment conditions, or to a delayed treatment condition. One treatment condition was labeled relapse prevention support groups (RPSG) and consisted of 14 group therapy sessions that used cognitive-behavioral therapy techniques and social support processes to decrease marijuana use. The other active treatment condition was labeled individualized assessment and intervention (IAI) and consisted of two individual treatment sessions that used motivational enhancement strategies and change planning that were modeled after the Drinker's Check-Up (Miller, Benefield and Tonigan, 1993; Miller and Sovereign, 1989). Stephens et al. (2000) offer a detailed description of ethical concerns regarding having a delayed treatment condition for people who were seeking treatment to help them stop using marijuana. Follow-up assessments were conducted 1, 4, 7, 13, and 16 months after the start of treatment so that assessment points would correspond to the end of each treatment condition, and then 3 and 12 months post-treatment for each condition.

### ***Procedures***

The screening process began with the interested callers being screen for age appropriateness. People who were at least 18 years of age and wanting help quitting marijuana were then asked to come in for an orientation process (either individually or in small groups). Those who were interested in joining the study went over an informed consent and also were asked to leave a \$60 deposit that would be refunded to them in part at each follow-up assessment that they attended. They were also asked to identify a collateral that could be contacted at each of the follow-up assessments. Confidentiality was explained to each of the potential participants and they were told that a Certificate of Confidentiality from the U.S. Department of Health and Human Services also protected their confidentiality.

After completion of the orientation process and the signing of the consent form, eligible participants were asked to complete a series of self-report questionnaires that assessed sociodemographic information and other psychosocial constructs. While the baseline assessment

took place in person, the follow-up assessment questionnaires were mailed to participants at each of the follow-up points. Follow-up assessments involved administration of many of the same sociodemographic measures, measures of marijuana use, and measures of other various psychosocial constructs (e.g., psychological distress).

### ***Treatment Conditions***

As described in Stephens et al. (2000), the RPSG condition consisted of 14-2 hour group sessions that took place over a period of 4 months. The first 10 sessions took place weekly, while the last 4 sessions took place every other week. Content of these group sessions included building motivation for change (weeks 1-4), building coping skills (weeks 5-10), and relapse prevention (weeks 11-14). Motivation for change was addressed through having participants list reasons for quitting, discuss consequences of use, and discuss advantages of stopping use. A quit session was conducted for everyone in the RPSG condition during the fourth week (the target quit date). The building of coping skills was addressed in five sessions through various exercises and role-plays. High-risk situations for relapse to marijuana use were identified and alternative strategies for handling these situations were a focus of treatment. It was encouraged that participants learn to anticipate high-risk situations and plan alternatives for coping for these situations in advance. Ten of the sessions included a debriefing of high-risk situations in which members of the group were given the opportunity to share their coping experiences. Sessions targeted both coping for psychologically distressing situations (i.e., stress and anger management) and non-psychologically distressing situations (i.e., coping with urges in general).

As mentioned previously, the IAI condition was modeled after the Drinker's Check Up (Miller et al., 1993). This condition consisted of two 90-minute individual sessions that were scheduled one month apart. In the first session, therapists provided an individual assessment report based on each participant's information that they provided in the pretreatment assessment questionnaires (i.e., frequency of marijuana use, problems related to use). Therapists for this condition provided feedback, used motivational interviewing techniques, provided an educational booklet on facts about marijuana, offered suggestions on self-monitoring of marijuana use, and suggested cognitive behavioral techniques for avoiding marijuana use in specific high-risk situations (via an individualized mailed letter).

## **Measures**

*Demographic Information.* Demographic information was collected from each participant in the study prior to treatment. Information asked included items such as age, gender, race, marital status, level of education completed, employment status, and legal status (see Appendix A).

*Marijuana use.* Marijuana use during the past 90 days was assessed at baseline and at each of the follow-up interviews (see Appendix B). Both frequency (the number of days that they used marijuana) and daily quantity (number of times of use on a typical day) were asked and serve as the primary measures of marijuana use. Validity for this measure has been shown by correlating self-reports with both collateral reports and with urine screens (Stephens et al., 1995; Stephens et al., 2000).

*Temptation Questionnaire (TQ).* The TQ (Appendix C) is an 18-item measure that was used both prior to and after completion of treatment that asks participants to rate on a 7-point scale how tempted they would be to use marijuana in specific situations. The stem for each question reads, “How tempted would you be to use marijuana if you were...” and then there are 18 situations that follow (e.g., if they were drinking alcohol or if they were feeling angry about something or someone). For the purpose of the current study 7 of the 18 items (see items in bold in Appendix C) were chosen a priori to represent situations specific to psychological distress (e.g., feeling depressed or worried, feeling embarrassed). A principal component analysis with varimax rotation performed on the 18 items suggested a two-factor solution. At baseline, one of the factors was defined by the same 7 items representing psychologically distressing situations. These 7 items were averaged to create an index of temptation to use marijuana in psychologically distressing situations (TQ-PD). The 7 items have an alpha or internal consistency equal to 0.83 at the baseline assessment and 0.88 at follow-up. Of the 11 items that remained three were dropped that did not load on to either factor well (e.g., using other drugs recreationally, drinking alcohol, and having to do some monotonous work). The eight items that make up the second factor are defined by temptation in non-psychologically distressing situations (TQ-NPD) (e.g., at a party where other people are using marijuana, with a spouse or close friend who was using marijuana). The second factor has internal consistency equal to .81 at baseline and .91 at follow-up.

*Frequency Questionnaire (FQ).* The FQ was used both prior to and after completion of treatment and asks participants to rate on a 7-point scale approximately how often they encounter the same situations listed in the TQ, with 1 = not having experienced that situation in the last year and 7 = having experienced it at least once daily during the past month (see items in bold in Appendix D). A principal component analysis with varimax rotation performed on the 18 frequency items suggested a two-factor solution and one of the factors was defined by the same 7 items representing psychologically distressing situations. These 7 items were averaged to create an index of frequency of encountering psychologically distressing situations (FQ-PD). The 7 items have an alpha or internal consistency equal to 0.85 at the baseline assessment and 0.88 at follow-up. Of the 11 items that remained three were dropped that did not load on to either factor well (e.g., using other drugs recreationally, drinking alcohol, and having to do some monotonous work). The eight items that make up the second factor are defined by temptation in non-psychologically distressing situations (FQ-NPD) (e.g., at a party where other people are using marijuana, with a spouse or close friend who was using marijuana). The second factor has internal consistency equal to .65 at baseline and .75 at follow-up.

*Situational Self-Efficacy Scale (SSES).* The SSES is an 18-item measure that was used both prior to and after completion of treatment that asks participants to rate on a 7-point scale how confident they are in their ability to resist marijuana in several different high-risk situations. The situations listed are identical to the situations listed in the TQ and FQ, but the beginning stem reads, “How confident are you that you could resist the temptation to use marijuana if you were...”. For the purpose of the current study 7 of the 18 items (see items in bold in Appendix E) were chosen a priori to represent a factor specific to psychological distress (e.g., feeling depressed or worried, feeling embarrassed). A principal component analysis with varimax rotation performed on the 18 items suggested a two-factor solution. One of the factors is defined by the same 7 items representing psychologically distressing situations. These 7 items were averaged to create an index of self-efficacy for being able to resist marijuana when psychologically distressed (SSES-PD). The 7 items have an alpha or internal consistency equal to 0.87 at the baseline assessment and 0.89 at follow-up. Of the 11 items that remained three were dropped that did not load on to either factor well (e.g., using other drugs recreationally, drinking alcohol, and having to do some monotonous work). The eight items that make up the second factor are defined by temptation in non-psychologically distressing situations (SSES-

NPD) (e.g., at a party where other people are using marijuana, with a spouse or close friend who was using marijuana). The second factor has internal consistency equal to .88 at baseline and .93 at follow-up.

*Coping Self-Efficacy Scale (CSES).* The CSES is a 33-item set of questions that was used both prior to and after completion of treatment that asks participants how confident they are that they could use various strategies to resist marijuana use when they are in three different types of high-risk situations (see Appendix F). The first situation involves feeling depressed or worried (e.g., If I was feeling depressed or worried I would be able to relax, exercise, take a hot bath, or do something else that would make me feel good.), the second situation addresses situations in that the person is with a close friend or spouse who is using (e.g., If I were with my spouse or close friend that was using marijuana I would be able to remember to think about the effect of my using on other people.), and the third situations addresses if the person felt like celebrating (e.g., If I was feeling like celebrating some good news or accomplishment I would be able to remind myself how much I had achieved by not using marijuana and that I didn't want to spoil it.). For each situation, the participant responds to the same 11 coping strategies on a 5-point scale with higher scores indicating greater confidence in the ability to use each strategy. The 11 items for the depressed/worried scale will be averaged to create an index of coping confidence in psychologically distressing situations (CSES-PD; ALPHA = .87 at baseline and .90 at follow-up). The 22 items assessing coping in social or celebratory situations will be averaged to create an index of coping confidence not specific to psychological distress (CSES-NPD; ALPHA = .94 at baseline and .97 at follow-up). While the SSES is also a measure of confidence to resist marijuana use, the SSES is a more global measure of coping, while the CSES was designed specifically to assess confidence in the use of coping strategies taught during the RPSG treatment.

*Brief Symptom Inventory (BSI).* The BSI (see Appendix G) was developed from a longer parent instrument, the SCL-90-R. It is a 53 item self-report questionnaire that is broken down into nine subscales (Somatization, Obsessive-Compulsive, Interpersonal Sensitivity, Depression, Anxiety, Hostility, Phobic Anxiety, Paranoid Ideation, and Psychoticism), and three larger summary scales (General Severity Index (GSI), Positive Symptom Distress Index, and Positive Symptom Total) that measure levels of current (last seven days) levels of psychological distress. The BSI is a commonly used assessment measure that has been shown to have good test-retest



reliability, internal consistency, convergent validity, discriminant validity, construct validity, and predictive validity (Derogatis, 1993; Derogatis and Melisaratos, 1983). The BSI was administered prior to treatment, after the initial completion of treatment, and at later follow-up assessment points as well.

The Global Severity Index (GSI), a subscale available from the BSI will be the primary measure used to indicate levels of psychological distress in the current study. The GSI is a measure of current levels of psychological distress and combines information on the number of symptoms and the intensity of perceived distress by the participant across all symptom scales. Based on GSI score, two subgroups were created. The psychologically distressed (PD) group had t-scores of 63 or above on the GSI and the not psychologically distressed (NPD) group had GSI t-scores lower than 63. The t-score of 63 was chosen to separate the two groups because prior research comparing GSI scores with other measures indicates that this score represents a clinically significant level of psychological distress (Derogatis, 1993). Overall, 57.3% (n=165) of the sample fell into the PD group and 42.7% (n=123) fell into the NPD group. A chi-square test shows that there is no significant difference between treatment conditions in the proportion of participants in each subgroup. Within the RPSG condition, 61.7% (n=71) fell into the PD group while 38.3% (n=44) fell into the NPD group. Within the IAI condition, 54% (n=47) fell into the PD group while 46% (n=40) fell into the NPD group. For the wait-list control (WLC) group, 54.7% (n=47) fell into the PD group while 45.3% (n=39) fell into the NPD group.

## **Results**

### Hypothesis 1 and 2

In order to inform the first and second hypotheses a 2 (Group: PD vs. NPD) x 2 (Situation: PD vs. NPD) mixed-model ANOVA was performed separately on the SSSES, CSES, TQ, and FQ scales. Group is the between-subjects factor formed by dividing the sample into PD and NPD sub-samples on GSI scores as described above. Situation is the within-subjects factor created by comparing scales for PD situations with scales for NPD situations on each measure. The first hypothesis predicted that a significant interaction of Group and Situation type would show that only PD individuals have significantly lower confidence in their ability to resist marijuana use (SSSES) and to use coping skills (CSES) in PD situations when compared to NPD situations, and that PD participants would be more tempted (TQ) to use marijuana by PD situations than NPD situations. The second hypothesis predicted lower mean scores for PD

compared to NPD participants on scales measuring self-efficacy in PD situations (SSES-PD and CSES-PD). For scales measuring frequency of encountering PD situations (FQ-PD) and temptation to use in those situations (TQ-PD), higher mean scores were expected for PD compared to NPD participants. Means and standard deviations are presented in Table 2.

SSES. For the SSES, there was a significant Group by Situation interaction ( $F(1, 286) = 12.59, p < .01, \eta^2 = .04$ ) that qualified significant main effects for Group ( $F(1, 286) = 17.03, p < .01, \eta^2 = .06$ ) and Situation type ( $F(1, 286) = 314.38, p < .01, \eta^2 = .52$ ). Contrary to the first hypothesis that PD individuals would have lower situational self-efficacy for PD situations compared to NPD situations, planned post hoc tests of means following the significant interaction indicated that both PD ( $t(164) = 10.41, p < .01$ ) and NPD ( $t(122) = 14.96, p < .01$ ) groups had higher situational self-efficacy for PD situations when compared to NPD situations. However, in support of Hypothesis 2, PD situations were rated differently by PD and NPD participants ( $t(286) = 5.58, p < .01$ ), with NPD participants having higher situational self-efficacy when it comes to resisting marijuana use in PD situations. There was no significant difference found for NPD situations ( $t(286) = 1.84, p > .05$ ) suggesting that both PD and NPD people have a similar level of situational self-efficacy when it comes to resisting marijuana use in NPD situations. Therefore, there was support for Hypothesis 2 that PD participants would have lower situational self-efficacy for resisting marijuana use in PD situations when compared to NPD participants.

CSES. The pattern of means for CSES was similar to that of the SSES, but no significant interaction effect was found for Group x Situation ( $F(1, 286) = 2.16, p > .05, \eta^2 = .01$ ). There was a significant main effect for situation type ( $F(1, 286) = 25.58; p < .00; \eta^2 = .08$ ), but no significant main effect for group ( $F(1, 286) = 2.61, p > .05, \eta^2 = .01$ ). Contrary to Hypothesis 1, mean coping self-efficacy was significantly higher for resisting marijuana use in PD situations ( $M = 3.58; SD = .77$ ) than in NPD situations ( $M = 3.45; SD = .80$ ) for all participants. Also, coping self-efficacy for PD situations was not rated differently by PD versus NPD participants. Therefore, there was no support for either hypothesis 1 or 2 because coping self-efficacy was greater for PD situations than NPD situations, and there were no differences in PD and NPD participants for PD situations.

TQ. For the TQ no significant interaction effect was found ( $F(1, 286) = .85, p > .05, \eta^2 = .00$ ). There was a significant main effect for situation type ( $F(1, 286) = 631.15; p < .01; \eta^2 =$

.69), but no main effect for group ( $F(1, 286) = .01, p > .05, \eta^2 = .00$ ). The main effect for situation indicated that both PD and NPD participants rated themselves as being more tempted to use marijuana in NPD ( $M = 5.41, SD = 1.17$ ) situations than in PD situations ( $M = 3.39, SD = 1.36$ ) and there was no difference in ratings of PD situations by PD versus NPD participants. Again, neither hypothesis 1 or 2 was supported.

FQ. For the FQ there was no significant interaction for Group x Situation ( $F(1, 286) = .05, p > .05, \eta^2 = .00$ ) nor main effects found for situation type ( $F(1, 286) = .15, p > .05, \eta^2 = .00$ ) or group ( $F(1, 286) = .20, p > .05, \eta^2 = .00$ ). Therefore, the second hypothesis that PD participants would indicate that they encountered PD situations more frequently than NPD participants was not supported. Instead, both PD and NPD participants indicated that they encountered NPD and PD situations at the same rate.

### Hypotheses 3

In order to examine the third hypothesis that participation in cognitive-behavioral treatment had a greater positive effect on self-efficacy in PD situations, and hence marijuana use, for PD participants compared to NPD participants, 3 (Condition: RPSG vs. IAI vs. DTC) x 2 (Group: PD vs. NPD) x 2 (Time: Pre-treatment vs. 4-month Follow-up) ANOVAs were conducted on measures of marijuana use, self-efficacy, coping efficacy, frequency of encountering PD situations, and temptation to use in those situations. In each analysis, a three-way interaction was expected such that PD participants in the RPSG condition would increase situational self-confidence for PD situations and reduce marijuana use more than NPD participants in the RPSG condition and more than both groups of participants in the IAI and DTC conditions. When a 3-way interaction was found, a series of 2 (Group: PD vs. NPD) x 2 (Time: Pre-treatment x 4-Month Follow-up) ANOVAs were performed separately for participants in each of the three treatment conditions. It was expected that only the analysis performed on RPSG participants would show the predicted interaction of Group x Time on measures of situational self-efficacy (SSES-PD), coping self-efficacy (CSES-PD), frequency of psychologically distressing situations (FQ-PD), and temptation to use in those situations (TQ-PD). Planned post hoc tests of means were conducted in order to show whether mean differences were in the direction expected for PD participants on each scale.

SSES. Results of the 3 x 2 x 2 ANOVA for PD situations did not detect a significant 3-way interaction ( $F(2, 204) = 1.27, p > .05, \eta^2 = .01$ ), nor were there significant 2-way

interactions for Time x Condition ( $F(2, 204) = 2.83, p > .05, \eta^2 = .03$ ), Time x Group ( $F(1, 204) = 1.63, p > .05, \eta^2 = .01$ ), or Treatment x Group ( $F(2, 204) = .04, p > .05, \eta^2 = .00$ ). There was a significant main effect for Time ( $F(1, 204) = 14.61, p < .01, \eta^2 = .07$ ) with situational self-efficacy for PD situations being higher at follow-up ( $M = 5.39, SD = 1.39$ ) than at baseline ( $M = 5.00, SD = 1.33$ ). There was also a significant main effect for Group ( $F(1, 204) = 22.05, p < .01, \eta^2 = .10$ ) with situational self-efficacy for PD situations being higher for NPD ( $M = 5.57, SD = .99$ ) participants than PD participants ( $M = 4.86, SD = 1.17$ ). There was no significant main effect found for Condition ( $F(2, 204) = 1.03, p > .05, \eta^2 = .01$ ). See Table 3 for means and standard deviations relating to this measure.

CSES. Results of the 3 x 2 x 2 ANOVA for PD situations also did not reveal a significant 3-way interaction ( $F(2, 203) = .88, p > .05, \eta^2 = .01$ ), nor significant 2-way interactions for Time x Condition ( $F(2, 203) = .92, p > .05, \eta^2 = .01$ ), Time x Group ( $F(1, 203) = .07, p > .05, \eta^2 = .00$ ), or Treatment x Group ( $F(2, 203) = .29, p > .05, \eta^2 = .00$ ). There were also no main effects present for Time ( $F(1, 203) = 1.13, p > .05, \eta^2 = .01$ ), Group ( $F(1, 203) = .94, p > .05, \eta^2 = .01$ ), or Condition ( $F(2, 203) = 1.49, p > .05, \eta^2 = .01$ ). See Table 4 for means and standard deviations relating to this measure.

IQ. Results of the 3 x 2 x 2 ANOVA for PD situations revealed a significant 3-way interaction ( $F(2, 206) = 3.47, p < .05, \eta^2 = .03$ ), and a significant 2-way interaction for Time x Condition ( $F(2, 206) = 5.20, p < .01, \eta^2 = .05$ ). There was no significant 2-way interaction found for Time x Group ( $F(1, 206) = 2.21, p > .05, \eta^2 = .01$ ) or Treatment x Group ( $F(2, 206) = .16, p > .05, \eta^2 = .00$ ). There were significant main effects present for Time ( $F(1, 206) = 28.99, p < .01, \eta^2 = .12$ ), Group ( $F(1, 206) = 13.34, p < .01, \eta^2 = .06$ ), and Condition ( $F(2, 206) = 6.02, p < .01, \eta^2 = .06$ ). See Table 5 for means and standard deviations relating to this measure.

Because a 3-way interaction was found, a series of 2 (Group: PD vs. NPD) x 2 (Time: Pre-treatment x 4-Month Follow-up) ANOVAs were performed separately for participants in each of the three treatment conditions. It was expected that only the analysis performed on RPSG participants would show the predicted interaction of Group x Time for PD situations. There was no significant interaction effect for Group x Time for the RPSG condition or the IAI treatment condition (RPSG:  $F(1, 78) = .06, p > .05, \eta^2 = .00$ ; IAI:  $F(1, 60) = .41, p > .05, \eta^2 = .01$ ). However, there were significant time effects for both active treatment conditions (RPSG:  $F(1,$

78) = 13.42,  $p < .01$ ,  $\eta^2 = .15$ ; IAI:  $F(1, 60) = 31.54$ ,  $p < .01$ ,  $\eta^2 = .35$ ) with means that indicated that temptation to use in PD situations for both PD and NPD participants decreased at follow-up (RPSG:  $M = 2.54$ ,  $SD = 1.38$ ; IAI:  $M = 2.18$ ,  $SD = 1.06$ ) as compared to baseline (RPSG:  $M = 3.28$ ,  $SD = 1.26$ ; IAI:  $M = 3.44$ ,  $SD = 1.41$ ). There was also a significant main effect for Group for the IAI condition ( $F(1, 60) = 4.47$ ,  $p > .05$ ,  $\eta^2 = .07$ ) with means that indicated that that NPD participants ( $M = 2.57$ ,  $SD = .82$ ) in this condition were less tempted to use in PD situations when compared to PD participants ( $M = 3.03$ ,  $SD = .90$ ).

Unexpectedly, there was a significant interaction effect for the DTC condition for Group x Time ( $F(1, 68) = 6.86$ ,  $p < .05$ ,  $\eta^2 = .10$ ) and a significant main effect for group ( $F(1, 68) = 6.29$ ,  $p < .05$ ,  $\eta^2 = .09$ ). There was no significant main effect for Time ( $F(1, 68) = .40$ ,  $p > .05$ ,  $\eta^2 = .01$ ). Planned post hoc tests indicated that there was evidence for change in temptation ( $t(33) = 2.41$ ,  $p < .05$ ) with means that indicated NPD participants were less tempted to use in PD situations at follow-up ( $M = 2.61$ ,  $SD = 1.18$ ) than at baseline ( $M = 3.47$ ,  $SD = 1.41$ ). There was no evidence of change in temptation among PD participants in the DTC condition ( $t(35) = -1.35$ ,  $p > .05$ ).

FQ. Results of the 3 x 2 x 2 ANOVA for PD situations did not find a significant 3-way interaction ( $F(2, 203) = .14$ ,  $p > .05$ ,  $\eta^2 = .00$ ). There was a significant 2-way interaction for Time x Group ( $F(1, 203) = 5.60$ ,  $p < .05$ ,  $\eta^2 = .03$ ). There were no significant 2-way interactions for Time x Condition ( $F(2, 203) = .31$ ,  $p > .05$ ,  $\eta^2 = .00$ ) or Treatment x Group ( $F(2, 203) = 1.06$ ,  $p > .05$ ,  $\eta^2 = .01$ ). There was a significant main effect present for Time ( $F(1, 203) = 11.74$ ,  $p < .01$ ,  $\eta^2 = .06$ ), but not for Group ( $F(1, 203) = 1.00$ ,  $p > .05$ ,  $\eta^2 = .01$ ), or Condition ( $F(2, 203) = .77$ ,  $p > .05$ ,  $\eta^2 = .01$ ). Test of means for the Time x Group interaction revealed that NPD participants stated that they encountered PD situations less frequently at follow-up ( $M = 3.43$ ,  $SD = .99$ ) than at baseline ( $M = 4.06$ ,  $SD = 1.11$ ) ( $t(99) = 4.29$ ,  $p < .01$ ). No evidence of change in frequency of encountering PD situations was present for PD participants ( $t(108) = .71$ ,  $p > .05$ ). See Table 6 for means and standard deviations relating to this measure.

Marijuana Use. Results of the 3 (Condition: RPSG vs. IAI vs. DTC) x 2 (Group: PD vs. NPD) x 2 (Time: Pre-treatment vs. 4-month Follow-up) ANOVA performed on the frequency of marijuana use did not detect the predicted 3-way interaction ( $F(2, 239) = .68$ ,  $p < .05$ ). There was a significant 2-way interaction ( $F(2, 239) = 23.71$ ,  $p < .05$ ) for Time by Condition, as well as a significant main effect present for Time ( $F(1, 239) = 413.85$ ,  $p < .05$ ). In order to

investigate the Time x Condition interaction, paired samples t-tests compared baseline and follow-up marijuana use for each of the conditions separately. T-tests revealed that there was a significant decrease in the frequency of marijuana use from baseline to follow-up for all treatment conditions (all  $ps < .05$ ). One-way ANOVAs revealed that at baseline there were no differences in frequency of marijuana use for the 3 different treatment conditions ( $F(2, 288) = .85, p > .05$ ), but that there were differences for the 3 treatment conditions at follow-up ( $F(2, 245) = 24.15, p < .05$ ). Post hoc LSD tests showed that the RPSG and IAI (RPSG:  $M = 20.05, SD = 29.62$ ; IAI:  $M = 23.63, SD = 32.93$ ) condition participants reported a significantly lower frequency of marijuana use at follow-up compared to DTC condition participants ( $M = 51.28, SD = 32.19$ ).

### Exploratory Analyses-Part 1

In order to examine the effects of the three different treatment conditions for non-psychologically distressing situations  $3$  (Condition: RPSG vs. IAI vs. DTC)  $\times$   $2$  (Group: PD vs. NPD)  $\times$   $2$  (Time: Pre-treatment vs. 4-month Follow-up) ANOVAs were conducted on measures of self-efficacy, coping efficacy, frequency of encountering NPD situations, and temptation to use in those situations.

SSSES. Results of the  $3 \times 2 \times 2$  ANOVA for NPD situations did not reveal a significant 3-way interaction ( $F(2, 204) = .75, p > .05, \eta^2 = .01$ ), nor significant 2-way interactions for Time  $\times$  Condition ( $F(2, 204) = 1.55, p > .05, \eta^2 = .02$ ), Time  $\times$  Group ( $F(1, 204) = .26, p > .05, \eta^2 = .00$ ), or Treatment  $\times$  Group ( $F(2, 204) = .57, p > .05, \eta^2 = .01$ ). There was a significant main effect for Time ( $F(1, 204) = 6.04, p < .05, \eta^2 = .03$ ) with means that indicated that situational self-efficacy for resisting marijuana use in NPD situations was higher at follow-up ( $M = 3.86, SD = 1.70$ ) than at baseline ( $M = 3.58, SD = 1.42$ ). There were no significant main effects for Group ( $F(1, 204) = 2.19, p > .05, \eta^2 = .01$ ) or for Condition ( $F(2, 204) = .79, p > .05, \eta^2 = .01$ ). See Table 3 for means and standard deviations relating to this measure.

CSES. Results of the  $3 \times 2 \times 2$  ANOVA for NPD situations did not reveal a significant 3-way interaction ( $F(2, 203) = 1.14, p > .05, \eta^2 = .01$ ), nor significant 2-way interactions for Time  $\times$  Condition ( $F(2, 203) = 1.18, p > .05, \eta^2 = .01$ ), Time  $\times$  Group ( $F(1, 203) = .36, p > .05, \eta^2 = .00$ ), or Treatment  $\times$  Group ( $F(2, 203) = .00, p > .05, \eta^2 = .00$ ). There was a main effect present for Time ( $F(1, 203) = 4.67, p < .05, \eta^2 = .02$ ) with means that indicated that coping self-efficacy for NPD situations was lower at follow-up ( $M = 3.29, SD = 1.00$ ) than at baseline ( $M = 3.44, SD$

= .78). This pattern of means was the opposite of the pattern that was found for situational self-efficacy. It is possible that this was a chance finding because this was not found for the CSES-PD scale. It may be that the inconsistency related to general comments made later in the discussion section regarding this measure. There was no significant main effect for Group ( $F(1, 203) = .03, p > .05, \eta^2 = .00$ ) or Condition ( $F(2, 203) = 2.57, p > .05, \eta^2 = .03$ ). See Table 4 for means and standard deviations relating to this measure.

TQ. Results of the 3 x 2 x 2 ANOVA for NPD situations did not reveal a significant 3-way interaction ( $F(2, 205) = .20, p > .05, \eta^2 = .00$ ). There was a significant 2-way interaction for Time x Condition ( $F(2, 205) = 9.44, p < .01, \eta^2 = .09$ ). There were no significant 2-way interactions for Time x Group ( $F(1, 205) = .25, p > .05, \eta^2 = .00$ ) or Treatment x Group ( $F(2, 205) = .59, p > .05, \eta^2 = .01$ ). There was a main effect present for Time ( $F(1, 205) = 31.81, p < .01, \eta^2 = .13$ ) and for Condition ( $F(2, 205) = 7.63, p < .01, \eta^2 = .07$ ), but not for Group ( $F(1, 205) = .08, p > .05, \eta^2 = .00$ ). Paired samples t-tests for RPSG condition showed that there was a significant difference in temptation to use marijuana in NPD situations ( $t(79) = 3.73, p < .01$ ) with temptation being lower at follow up ( $M = 4.57, SD = 1.65$ ) than at baseline ( $M = 5.45, SD = 1.65$ ). The same pattern of results were present for the IAI condition ( $t(62) = 5.64, p < .01$ ) with temptation to use in NPD situations being lower at follow-up ( $M = 3.98, SD = 1.70$ ) than at baseline ( $M = 5.41, SD = 1.21$ ). There was no significant difference from baseline to follow-up for the DTC condition ( $t(68) = -.21, p > .05$ ). A 1-way ANOVA revealed that at baseline there were no differences in level of temptation to use in NPD situations for the 3 different treatment conditions ( $F(2, 288) = .02, p > .05$ ), but that there were differences for the 3 treatment conditions at follow-up ( $F(2, 209) = 13.76, p < .01$ ). Post hoc LSD tests showed that all 3 treatment conditions were significantly different from one another (all  $p$ 's  $< .05$ ). The mean for the IAI condition at follow-up was 3.98 ( $SD = 1.70$ ), the mean for the RPSG condition was 4.57 ( $SD = 1.65$ ), and the mean for the DTC condition was 5.39 ( $SD = 1.27$ ). Overall, findings show that temptation to use marijuana decreased significantly in both the active treatment conditions, but not in the delayed treatment control condition. From the mean differences present at follow-up it is apparent that the greatest reduction in temptation occurred in the IAI condition, followed by the RPSG condition and then finally the DTC conditions. See Table 5 for means and standard deviations.

FQ. Results of the 3 x 2 x 2 ANOVA for NPD situations did not detect a significant 3-way interaction ( $F(2, 203) = .08, p > .05, \eta^2 = .00$ ). There was a significant 2-way interaction for Time x Condition ( $F(2, 203) = 4.50, p < .05, \eta^2 = .04$ ). There were no significant 2-way interactions for Time x Group ( $F(1, 203) = .32, p > .05, \eta^2 = .00$ ) or Treatment x Group ( $F(2, 203) = .14, p > .05, \eta^2 = .00$ ). There was a main effect present for Time ( $F(1, 203) = 18.37, p < .01, \eta^2 = .03$ ) and for Group ( $F(1, 203) = 4.16, p < .05, \eta^2 = .02$ ), but not for Condition ( $F(2, 203) = .19, p > .05, \eta^2 = .00$ ). In order to investigate the Time x Condition interaction, paired samples t-tests compared baseline and follow-up scores for each of the conditions separately. For the RPSG condition there was a significant difference in frequency of encountering NPD situations ( $t(77) = 3.32, p < .01$ ) with frequency being lower at follow up ( $M = 3.61, SD = .92$ ) than at baseline ( $M = 4.03, SD = .81$ ). The same pattern of results were present for the IAI condition ( $t(62) = 3.94, p < .01$ ) with frequency of encountering NPD situations being lower at follow-up ( $M = 3.44, SD = .82$ ) than at baseline ( $M = 4.09, SD = .85$ ). There was no significant difference from baseline to follow-up for the DTC condition ( $t(68) = .14, p > .05$ ). A 1-way ANOVA revealed that at baseline there were no differences in level of frequency of encountering NPD situations for the 3 different treatment conditions ( $F(2, 288) = .92, p > .05$ ), but that there were differences for the 3 treatment conditions at follow-up ( $F(2, 207) = 3.53, p < .05$ ). Post hoc LSD tests showed that the IAI condition participants reported a significantly lower frequency of encountering NPD situations ( $M = 3.44, SD = .82$ ) than DTC participants ( $M = 3.84, SD = .82$ ). The RPSG condition mean did not differ significantly from the IAI or DTC conditions (both  $p$ 's  $> .05$ ), but the mean fell between the other treatment conditions ( $M = 3.61, SD = .92$ ). Overall, findings show that frequency of encountering NPD situations decreased significantly in both the active treatment conditions, but not in the delayed treatment control condition. From the means it is apparent that the greatest reduction in frequency of encountering NPD situations occurred in the IAI condition, but that the amount of reduction was only significantly different than the reduction in the DTC condition and not significantly different than the reduction in the RPSG condition. See Table 6 for means and standard deviations.

#### Exploratory Analyses-Part 2

Although the predicted superiority of CBT for psychologically distressed individuals (Hypothesis 3) was not found, exploratory analyses were conducted to investigate the relationship between changes in frequency of marijuana use and changes in situational self-



efficacy and coping self-efficacy for the full sample in both PD and NPD situations. Change scores were computed by subtracting the score at baseline from the score at follow-up (e.g. marijuana use at baseline was subtracted from marijuana use at follow-up, situational self-efficacy for PD situations at baseline was subtracted from situational self-efficacy for PD situations at follow-up). Change scores were then correlated and tests of significant differences between correlation coefficients were conducted using Fisher's  $z$  transformation.

For the SSES-PD there was a significant negative correlation between changes in use and changes in situational self-efficacy for PD participants ( $r(109) = -.43, p < .01$ ), and for NPD participants ( $r(100) = -.25, p < .01$ ). On the CSES-PD there was a significant negative correlation present for PD participants ( $r(108) = -.42, p < .01$ ) but not for NPD participants ( $r(100) = -.19, p > .05$ ). Therefore, changes in marijuana use were related to changes in self-efficacy in PD situations in the expected direction, but Fisher's  $z$  transformation did not detect a significant difference between the magnitude of the correlations for PD versus NPD participants for either the SSES ( $z = 1.50, p > .05$ ), or the CSES ( $z = 1.83, p > .05$ ).

Similarly, for the SSES-NPD there was a significant negative correlation between changes in use and changes in situational self-efficacy for PD participants ( $r(109) = -.37, p < .01$ ), and for NPD participants ( $r(100) = -.27, p < .01$ ). On the CSES-NPD there was a significant negative correlation present for PD participants ( $r(108) = -.43, p < .01$ ) and NPD participants ( $r(100) = -.27, p < .01$ ). Again, Fisher's  $z$  transformation did not reveal differences between the correlations for PD and NPD participants the SSES ( $z = .79, p > .05$ ) or the CSES ( $z = 1.48, p > .05$ ).

## Discussion

The present study investigated the relationship of psychological distress, self-efficacy, and marijuana use in a sample of treatment seeking adults. At baseline there was evidence that psychologically distressed individuals reported lower situational self-efficacy for resisting marijuana use in psychologically distressing situations compared to non-psychologically distressed individuals. However, psychologically distressed individuals did not have lower coping self-efficacy for and were not more tempted by these psychologically distressing situations compared to non-psychologically distressing situations. After treatment, it was found that situational self-efficacy increased and temptation to use and reports of encountering negative affect situations decreased for both psychologically distressing and non-psychologically

distressing situations. Coping self-efficacy at follow-up for psychologically distressing situations did not change over time and actually decreased over time for non-psychologically distressing situations. It was also found that decreases in marijuana use were comparable for PD and NPD participants in the RPSG and IAI conditions. Thus, participation in cognitive behavioral therapy did not have the predicted effect of leading to the greatest reductions in marijuana use for PD participants through increases in situational and coping self-efficacy in PD situations. Each of the findings is discussed in turn with possible explanations for the findings offered.

The first hypothesis predicted that, at baseline, individuals with psychological distress would report lower situational and coping self-efficacy and higher temptation to use in psychologically distressing situations compared to non-psychologically distressing situations. There was no support found for this hypothesis. Psychologically distressed individuals had lower situational self-efficacy and higher temptation ratings for non-psychologically distressing situations compared to psychologically distressing situations. No differences were detected for coping self-efficacy when comparing psychologically distressing and non-psychologically distressing situations. These patterns suggest that even for psychologically distressed participants, non-psychologically distressing situations may constitute a greater risk for marijuana use than psychologically distressing situations.

The second hypothesis predicted that at baseline psychologically distressed individuals would be less confident about their ability to resist marijuana and use coping skills in psychologically distressing situations compared to non-psychologically distressed participants. Similarly, it was predicted that psychologically distressed individuals would report being more tempted to use in psychologically distressing situations and would report that they encountered psychologically distressing situations more often than non-psychologically distressed participants. In line with predictions it was found that non-psychologically distressed participants had higher situational self-efficacy for resisting marijuana use in psychologically distressing situations than did psychologically distressed participants. These results imply that dealing with psychologically distressing situations is not the same for every participant, and that psychologically distressed participants actually have lower self-efficacy for resisting marijuana in psychologically distressing situations than do non-psychologically distressed participants.

However, unlike the findings for situational self-efficacy, findings of coping self-efficacy and temptation levels did not support the second hypothesis. There were no differences in coping

self-efficacy or level of temptation for psychologically distressing situations based on level of psychological distress at baseline. Thus, it is not clear why situational self-efficacy would be lower. Also contrary to prediction, PD participants did not report that they encountered psychologically distressing situations more than NPD participants. The absence of this latter effect calls into question the validity of the FQ measure because those with high levels of psychological distress should be encountering psychologically distressing situations more often. Perhaps the types of psychologically distressing situations on the FQ do not match well with the type of distress detected by the GSI.

Overall, the baseline data provided limited support for the notion that individuals with high levels of psychological distress are at particular risk of relapse to marijuana use in psychologically distressing situations. Only the results for situational self-efficacy were in line with this hypothesis. More research has been conducted with situational self-efficacy as compared to coping self-efficacy or situational temptation and the SSES has more validity evidence than the CSES, TQ or FQ. One of the only studies examining the predictive validity of measures of these constructs found that situational self-efficacy was more strongly related to future marijuana use (Stephens et al, 1995). Thus, the current finding of reduced self-efficacy in psychologically distressing situations for psychologically distressed individuals suggests that treatment geared towards increasing self-efficacy in psychologically distressed participants for psychologically distressing situations might contribute to improved treatment outcomes.

The third hypothesis predicted that participation in cognitive-behavioral treatment (RPSG), rather than the assessment and advice (IAI) or a delayed treatment control (DTC) conditions, would have a greater positive effect on situational and coping self-efficacy in psychologically distressing situations for psychologically distressed individuals compared to non-psychologically distressed individuals. It was found that situational self-efficacy in psychologically distressing situations did increase from baseline to follow-up, however treatment condition did not make a difference as predicted. Also, situational self-efficacy for psychologically distressing situations was still higher at follow-up for non-psychologically distressed individuals than psychologically distressed individuals regardless of treatment condition. This implies that, even with treatment, psychologically distressed participants continue to have lower situational self-efficacy compared to non-psychologically distressed individuals. For coping self-efficacy there was no increase found at follow-up.

Further, hypothesis 3 predicted that participation in the RPSG condition would lead to lower reports of encountering psychologically distressing situations and lower temptation ratings of psychologically distressing situations. While temptation to use in psychologically distressing situations decreased from baseline to follow-up for both the RPSG and IAI conditions, there was no support for the hypothesis that cognitive behavioral treatment would lead to the greatest decreases in temptation. Unexpectedly, the non-psychologically distressed participants in the DTC condition also had a decrease in their level of temptation for psychologically distressing situations from baseline to follow-up. This decrease in temptation was not present for psychologically distressed participants in the DTC condition. Regarding frequency of encountering non-psychologically distressing situations, non-psychologically distressed participants stated that they encountered psychologically distressing situations less frequently at follow-up than at baseline regardless of treatment condition. There was no change in the frequency of encountering psychologically distressing situations reported by psychologically distressed participants as hypothesis 3 predicted.

Most importantly, hypothesis 3 predicted that the RPSG condition would have the greatest effect on reductions in marijuana use for psychologically distressed individuals. Reductions in marijuana use occurred from baseline to follow-up with the IAI and RPSG conditions having greater reductions than the DTC condition. However, the hypothesis that the RPSG condition would have the greatest effect on psychologically distressed participants was not supported.

One possible reason for the lack of support for Hypothesis 3 might be that participants were overconfident at the time of the pretreatment assessment and therefore gave inflated self-efficacy ratings at the beginning. Bandura (1997) notes that overconfidence, rather than underconfidence, is a common error in self-appraisals. This may be because substances users are unaware of the difficulty they will encounter when trying to reduce their use and this may lead to an unintentional overconfidence at pretreatment assessment (such as overconfidence in situational and coping self-efficacy ratings). It is likely that once substance users have attempted to abstain that they will learn more about themselves and the situations that are difficult for them and therefore have more accurate self-efficacy ratings later. Stephens et al. (1995) also found evidence for increased awareness brought about by treatment leading to differential ratings of self-efficacy (see also Cooney, Gillespie, Baker, & Kaplan, 1987). In particular, Stephens et al.

(1995) found the strength of the relationship between recent marijuana use and self-efficacy for avoiding use was substantially stronger after treatment. Therefore, in the current study it is possible that overconfidence at baseline led to inflated self-efficacy ratings that in turn reduced the increase in self-efficacy that might have otherwise been found at follow-up.

Exploratory analyses were conducted in order to examine the relationship of self-efficacy, temptation to use, and reports of encountering situations for NPD situations. Although not specific to the focus of the current study, cognitive-behavioral treatment might be expected to increase self-efficacy in non-psychologically distressing situations more than the IAI or DTC conditions, but the effect would not be different based on level of psychological distress. Situational self-efficacy in NPD situations increased for all participants from baseline to follow-up. However, the cognitive behavioral treatment did not lead to a greater increase in situational self-efficacy compared to the IAI and DTC conditions. Results indicated that there was actually a decrease in coping self-efficacy from baseline to follow-up and again, there was no evidence coping self-efficacy was affected differentially by the different treatment conditions. Also, there was a decrease in encountering non-psychologically distressing situations and temptation to use in those situations for both active treatment conditions, but not for the control condition.

Exploratory analyses also examined the relationship of changes in self-efficacy and changes in marijuana use. Correlational analyses provided evidence that increases in situational self-efficacy for psychologically distressing situations were significantly related to decreases in marijuana use for both psychologically distressed and non-psychologically distressed participants. Increases in coping self-efficacy for psychologically distressing situations were only significantly related to decreases in marijuana for psychologically distressed participants. These findings provide evidence for a relationship between increases in self-efficacy and decreases in marijuana use.

There are several possible explanations as to why the hypotheses of this paper were not entirely supported. First of all, it is possible that the predicted relationship between psychological distress and marijuana use does not exist. However, there are several other reasons that could account for the lack of relationship including: 1) problems with correctly identifying psychologically distressed participants, 2) problems with measures used to assess coping self-efficacy and other constructs 3) treatment aimed at coping skills may not have had the desired effect, and finally 4) having treatment conditions that are not specifically designed to target

coping deficits in psychologically distressed participants. Each of these possible explanations and potential weaknesses of the current study are discussed in turn and alternatives for future studies are offered.

It is possible that the Brief Symptom Inventory's Global Severity Index was not the ideal measure to use in order to identify psychologically distressed individuals. It may be that while the cutoff used to identify psychologically distressed individuals is thought to represent a clinical level of distress, the level of distress is not high enough. Future studies that look at the relationship between psychological distress and marijuana use may want to use different criteria for identifying people suffering from psychological distress such as DSM-IV-TR (American Psychiatric Association, 2000) criteria for Axis 1 or Axis 2 disorders instead of a cutoff from a self-report based measure. More stringent criteria for psychological distress may lead to a more accurate identification of the population of interest.

A second reason that may account for the lack of findings may be that some measures did not do an adequate job of assessing the constructs of interest. The CSES, FQ, and TQ are not standardized measures and have not been validated. It is recommended that future studies take care to ensure the construct validity of these types of measures. Inadequate construct validity may have led to an inability to detect changes that took place in the current study.

A third explanation that may account for the lack of findings is that coping skills were never acquired as a result of the RPSG treatment. Longabaugh and Morgenstern (1999) found that it is not clear what part of CBT therapy actually leads to increases in coping skills and that acquisition of coping skills may not occur in CBT treatments (also for a review see Morgenstern and Longabaugh, 2000). Additionally, CBT treatments for substance abuse are not any more effective than other treatments when cognitive behavioral coping skills therapy is used as a stand alone treatment (see also Kallmen, Sjoberg, and Wennberg, 2003). It is possible that in the current study the RPSG condition did not lead to an increase in coping skills and that may account for the lack of predicted findings.

Finally, although treatment included coping skills training, it did not target coping deficits unique to psychologically distressed participants. Treatment took place in a group setting that included both psychologically distressed and non-psychologically distressed individuals and did not focus on issues of psychological distress. It has been shown that when psychological distress and substance use disorders co-occur, therapy targeted at one or the other problem does

not solve the problem that was not targeted (Kelly, McKellar, and Moos, 2003; Riggs and Davies, 2002), and therefore tailored treatments that address both issues should be used when working with people who have co-occurring psychological distress with substance use disorders. Research has shown that treatment outcomes for dually-diagnosed individuals are improved when treatment targets psychological distress as well as substance use (Brown and Ramsey, 2000; Siegfried, 1998).

Treatment in the current study was not tailored to meet the needs of psychologically distressed individuals and this may account for the lack of difference in treatment condition that was found in the current study.

Another limitation of the current study relates to how participants who attended follow-up were different than those who did not. Individuals who did not attend follow-up tended to use more marijuana at baseline, had completed less education, and had more legal problems. Therefore the results of the current study may not generalize to these types of individuals. In the case of the TQ-PD and TQ-NPD some caution should be used in interpreting results because it appears that there were differences between the people who attended and those who did not attend the follow-up by condition.

The above findings have implications for situation specific coping liabilities, treatment, and theory. It is apparent that people who suffer from psychological distress have lower self-efficacy for resisting the use of marijuana in psychologically distressing situations compared to people who do not suffer from psychological distress. This indicates that psychologically distressed individuals represent a unique group and that treatment should take this into consideration. It is apparent that substance abuse treatment for marijuana alone is not enough for individuals who experience co-occurring psychological distress.

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Table 1

*Baseline Means and Standard Deviations of Marijuana Use, SSES, CSES, TQ, FQ, and GSI for Entire Sample*

<u>Variables</u>	<u>M</u>	<u>SD</u>	<u>Variables</u>	<u>M</u>	<u>SD</u>
Days of MJ	74.64	18.54	TQ-PD	3.39	1.36
SSES-PD	4.99	1.41	TQ-NPD	5.40	1.18
SSES-NPD	3.60	1.46	FQ-PD	4.01	1.20
CSES-PD	3.58	.77	FQ-NPD	4.04	.83
CSES-NPD	3.46	.80	GSI	64.01	10.68

*Note.* N = 291 for all but GSI where N = 288. Days of MJ = Days of marijuana use out of the last 90 days at baseline, SSES-PD = Situational Self Efficacy Scale-Psychologically Distressed, SSES-NPD = Situational Self Efficacy Scale-Non-Psychologically Distressed, CSES-PD = Coping Self Efficacy Scale-Psychologically Distressed, CSES-NPD = Coping Self Efficacy Scale-Non-Psychologically Distressed, TQ-PD = Temptation Questionnaire-Psychologically Distressed, TQ-NPD = Temptation Questionnaire-Non-Psychologically Distressed, FQ-PD = Frequency Questionnaire-Psychologically Distressed, FQ-NPD = Frequency Questionnaire-Non-Psychologically Distressed, GSI = Global Severity Index.

Table 2

*Means and Standard Deviations of SSES, CSES, TQ, FQ by Level of Psychological Distress*

Variables	<u>Psychologically Distressed (n = 165)</u>		<u>Non- Psychologically Distressed (n = 123)</u>	
	<u>Baseline</u>		<u>Baseline</u>	
	<u>M</u>	<u>SD</u>	<u>M</u>	<u>SD</u>
SSES-PD	4.59	1.44	5.48	1.17
SSES-NPD	3.45	1.47	3.78	1.44
-----				
--				
CSES-PD	3.50	0.78	3.68	0.75
CSES-NPD	3.41	0.79	3.51	0.82
-----				
TQ-PD	3.43	1.36	3.34	1.37
TQ-NPD	5.38	1.21	5.44	1.11
-----				
FQ-PD	3.99	1.23	4.05	1.16
FQ-NPD	4.04	.084	4.06	0.82

*Note.* See description under Table 1 for full names of scales.

Table 3

*Means and Standard Deviations of SSES by Condition and Time*

	<u>Baseline</u>				<u>Follow-Up</u>			
	<u>PD-Situations</u>		<u>NPD-Situations</u>		<u>PD-Situations</u>		<u>NPD-Situations</u>	
<u>PD</u> n = 42	4.61	1.30	3.46	1.36	5.20	1.71	3.82	1.78
<u>RPSG</u>								
<u>NPD</u> n = 36	5.34	1.19	3.71	1.38	5.82	1.41	4.11	1.74
-----								
<u>PD</u> n = 32	4.48	1.15	3.29	1.31	5.42	1.22	3.88	1.65
<u>IAI</u>								
<u>NPD</u> n = 30	5.61	1.14	3.91	1.29	5.83	1.12	4.30	1.66
-----								
<u>PD</u> n = 36	4.71	1.60	3.68	1.75	5.11	1.46	3.43	1.61
<u>DTC</u>								
<u>NPD</u> n = 34	5.37	1.16	3.46	1.34	5.45	1.13	3.71	1.71



Table 4

*Means and Standard Deviations of CSES by Condition and Time*

	<u>Baseline</u>				<u>Follow-Up</u>			
	<u>PD-Situations</u>		<u>NPD-Situations</u>		<u>PD-Situations</u>		<u>NPD-Situations</u>	
<u>PD</u> n = 42	3.43	.83	3.25	.81	3.54	.88	3.34	1.08
<u>RPSG</u>								
<u>NPD</u> n = 36	3.59	.65	3.42	.74	3.46	.79	3.15	1.05
-----								
<u>PD</u> n = 31	3.58	.72	3.58	.66	3.56	.88	3.53	.91
<u>IAI</u>								
<u>NPD</u> n = 30	3.76	.70	3.58	.76	3.76	.80	3.50	.99
-----								
<u>PD</u> n = 36	3.59	.75	3.49	.85	3.34	.91	3.13	1.02
<u>DTC</u>								
<u>NPD</u> n = 34	3.57	.78	3.40	.85	3.44	.74	3.16	.81

Table 5

*Means and Standard Deviations of TQ by Condition and Time*

	<u>Baseline</u>				<u>Follow-Up</u>			
	<u>PD-Situations</u>		<u>NPD-Situations</u>		<u>PD-Situations</u>		<u>NPD-Situations</u>	
<u>PD</u> n = 42	3.44	1.27	5.32	1.18	2.74	1.43	4.55	1.70
<u>RPSG</u>								
<u>NPD</u> n = 38	3.11	1.24	5.59	.94	2.32	1.32	4.59	1.62
-----								
<u>PD</u> n = 32	3.73	1.50	5.39	1.17	2.33	1.20	4.14	1.63
<u>IAI</u>								
<u>NPD</u> n = 30	3.12	1.25	5.42	1.28	2.01	.89	3.91	1.73
-----								
<u>PD</u> n = 36	3.32	1.38	5.46	.98	3.85 <sup>a</sup>	1.69 <sup>a</sup>	5.45 <sup>a</sup>	1.44 <sup>a</sup>
<u>DTC</u>								
<u>NPD</u> n = 34	3.47	1.41	5.24	1.10	2.61	1.18	5.33	1.08

<sup>a</sup>n = 35.

Table 6

*Means and Standard Deviations of FQ by Condition and Time*

	<u>Baseline</u>				<u>Follow-Up</u>			
	<u>PD-Situations</u>		<u>NPD-Situations</u>		<u>PD-Situations</u>		<u>NPD-Situations</u>	
<u>PD</u> n = 42	3.77	1.18	3.97	.74	3.68	1.32	3.47	.90
<u>RPSG</u>								
<u>NPD</u> n = 36	3.99	1.22	4.10	.89	3.53	1.07	3.77	.92
-----								
<u>PD</u> n = 32	3.87	1.23	4.04	.86	3.68	1.23	3.37	.94
<u>IAI</u>								
<u>NPD</u> n = 30	4.13	1.03	4.16	.86	3.34	.97	3.58	.62
-----								
<u>PD</u> n = 35	4.11	1.34	3.80	.89	4.05	1.23	3.78	.85
<u>DTC</u>								
<u>NPD</u> n = 34	4.06	1.08	3.91	.59	3.39	.93	3.90	.81

Table 7

*Correlations for Difference in Marijuana Use from Baseline to Follow-Up and Difference in Situational Self-Efficacy and Coping Self-Efficacy from Baseline to Follow-Up*

Situation	Correlation
PD n = 109	-.43**
SSES-PD	
NPD n = 100	-.25*
<hr/>	
PD n = 109	-.37**
SSES-NPD	
NPD n = 100	-.27**
<hr/>	
PD n = 108	-.42**
CSES-PD	
NPD n = 100	-.19
<hr/>	
PD n = 108	-.43**
CSES-NPD	
NPD n = 100	-.27**

\*  $p < .05$ , \*\*  $p < .01$ .

## **Appendix A**

## Demographic Information

Please answer the following questions as completely as possible. Thank you.

1. Sex: (Please check) (1)\_\_\_Female (2)\_\_\_Male
2. Age: \_\_\_\_\_years
3. Current relationship status: (Please check)  
(1)\_\_\_Single (4)\_\_\_Divorced or separated  
(2)\_\_\_Married (5)\_\_\_Widowed  
(3)\_\_\_Living with partner
4. How many years of school have you completed?  
  
\_\_\_\_\_ years
5. Do you have (check all that apply):  
  
(1)\_\_\_GED or High School Equivalency Diploma  
(2)\_\_\_Regular High School diploma  
(3)\_\_\_Associate degree  
(4)\_\_\_College (Bachelor's) degree  
(5)\_\_\_Master's degree  
(6)\_\_\_Doctoral degree
6. Race (Please check):  
  
(1)\_\_\_White (4)\_\_\_Asian  
(2)\_\_\_Black (5)\_\_\_Hispanic  
(3)\_\_\_Native American (6)\_\_\_Other (specify)\_\_\_\_\_

7. What is your current employment status (check only one of the following categories)?

- (1) \_\_\_\_ Employed full time
- (2) \_\_\_\_ Employed part time
- (3) \_\_\_\_ Unemployed, seeking work
- (4) \_\_\_\_ Unemployed, not seeking work (homemaker, student, retired, disabled, etc.)

8. Please circle the number that best describes the type of job you currently have. If you do not have a job, circle 1.

- 1      None
- 2      professional or managerial (doctor, teacher, manager, architect, engineer, executive, etc.)
- 3      clerical or sales (bookkeeper, office worker, salesperson)
- 4      skilled or technical worker (mechanic, electrician, baker, carpenter, medical technician, etc.)
- 5      semi-skilled worker (construction, driving, general labor, etc.)
- 6      unskilled
- 7      other (please specify) \_\_\_\_\_

9. What was your family's income (to the nearest thousand dollars) over the past year?

\$ \_\_\_\_\_

10. What was your personal income (to the nearest thousand dollars) over the past year?

\$ \_\_\_\_\_

11. In the last twelve months have you fallen behind in paying your bills?

- (1) \_\_\_\_ Yes                      (2) \_\_\_\_ No

12. Check the category that best described where you presently live.

- (1)\_\_\_ own house
- (2)\_\_\_ apartment or rented house
- (3)\_\_\_ room
- (4)\_\_\_ institution
- (5)\_\_\_ no fixed address (e.g., hotels)
- (6)\_\_\_ other \_\_\_\_\_

13. Please indicate on the line below how many times you moved in the past year

\_\_\_\_\_

14. Please check the category below that best described how frequently you had contact with members of your family over the past year.

- (1)\_\_\_ Daily
- (2)\_\_\_ Weekly
- (3)\_\_\_ Monthly
- (4)\_\_\_ Less than monthly
- (5)\_\_\_ None

15. Check the response that best described whether or not you could return to love with members of your family.

- (1)\_\_\_ Does not apply
- (2)\_\_\_ Yes
- (3)\_\_\_ Uncertain
- (4)\_\_\_ No



16. Please indicate on the line below how many months you were employed full time or part time during the past year.

\_\_\_\_\_

17. Please indicate on the line below how many job changes you have made in the past year.

\_\_\_\_\_

18. Check the response that described your current legal status.

(1)\_\_\_no problems

(2)\_\_\_awaiting trial

(3)\_\_\_on probation or parole

19. Please indicate on the line below approximately how many days of work you missed over this past year due to use of alcohol or drugs. Enter 0 if none.

\_\_\_\_\_

20. Indicate on the line below how many days of the past year you spent in jail or prison. Enter 0 if none.

\_\_\_\_\_

21. Please indicate on the line below how many arrests and convictions you had for alcohol and drug offenses over the past year.

\_\_\_\_\_

## **Appendix B**

## Marijuana Use Information

In answering the following question concerning your use of drugs, please remember that your responses are protected by a Certificate of Confidentiality from the federal government.

22. How old were you when you first tried marijuana?  
\_\_\_\_\_ years
23. How many years have you used marijuana in total in your life?  
\_\_\_\_\_ years
24. Has there been a time in your life when you used marijuana on a daily or near daily basis for at least a month?  
(1)\_\_\_Yes                      (2)\_\_\_No

If you answered yes, how old were you when you first used marijuana on a daily or near daily basis for at least a month?

- \_\_\_\_\_ years
25. In the past 90 days, how many days did you smoke marijuana at least once?  
\_\_\_\_\_ days
26. In the past 90 days, on a typical day when you smoked marijuana, about how many time per day did you smoke?
- (0) \_\_\_\_\_ not at all
- (1) \_\_\_\_\_ 1 smoking occasion per day of use
- (2) \_\_\_\_\_ 2-3 smoking occasions per day of use
- (3) \_\_\_\_\_ 4-5 smoking occasions per day of use
- (4) \_\_\_\_\_ 6 or more smoking occasions per day of use

27. On a typical weekday when you smoke marijuana, what time of day do you usually smoke? Check as many time periods as apply.
- \_\_\_\_\_ 8:00am to noon
- \_\_\_\_\_ 12:00 noon to 5:00pm
- \_\_\_\_\_ 5:00pm to 9:00pm
- \_\_\_\_\_ 9:00pm to 12:00 midnight
- \_\_\_\_\_ 12:00 midnight to 8:00am
28. On a typical weekend day when you smoke marijuana, what time of day do you usually smoke? Check as many time periods as apply.
- \_\_\_\_\_ 8:00am to noon
- \_\_\_\_\_ 12:00 noon to 5:00pm
- \_\_\_\_\_ 5:00pm to 9:00pm
- \_\_\_\_\_ 9:00pm to 12:00 midnight
- \_\_\_\_\_ 12:00 midnight to 8:00am
29. In a typical week in the last 90 days, how often did you smoke marijuana just before or during your work hours? If you are not employed, how often did you smoke marijuana before or during the time you were carrying out other responsibilities? (Check one.)
- (0) \_\_\_\_\_ Never during work hours
- (1) \_\_\_\_\_ Once a week
- (2) \_\_\_\_\_ Two or three days a week
- (3) \_\_\_\_\_ Four or more days a week
30. How do you usually smoke marijuana? (Check one.)
- (1) \_\_\_\_\_ joints
- (2) \_\_\_\_\_ pipes
- (3) \_\_\_\_\_ both joints and pipes

31. In the past 90 days, on a typical day when you smoke marijuana, about how many joints did you smoke? If you don't smoke joints try to estimate how many average sized joints you could roll from the amount you smoked in a pipe.

\_\_\_\_\_ joints (OK to use fractions, e.g. 1/4, 1/3, 1/2, etc. )

32. In the past 90 days, how much marijuana did you smoke in terms of its weight? Use either the ounces or the grams category below.

\_\_\_\_\_ ounces

\_\_\_\_\_ grams

33. How much did lack of access to marijuana influence the amount you smoked during the past 90 days?

(1) \_\_\_\_\_ Not at all, I didn't have any trouble getting access

(2) \_\_\_\_\_ Somewhat, I would have smoked a little more if I had easier access

(3) \_\_\_\_\_ Quite a bit, I would have smoked a lot more if I had easier access

34. How much did the cost of marijuana influence the amount you smoked during the past 90 days?

(1) \_\_\_\_\_ Not at all, cost didn't keep me from smoking as much as I wanted

(2) \_\_\_\_\_ Somewhat, I would have smoked a little more if it was cheaper

(3) \_\_\_\_\_ Quite a bit, I would have smoked a lot more if it was cheaper

35. Is there urine testing program in your workplace for employees at your level?

(0) \_\_\_\_\_ Not applicable, I'm not currently employed (Skip to question #39)

(1) \_\_\_\_\_ Yes, currently

(2) \_\_\_\_\_ No, but one is going to start

(3) \_\_\_\_\_ No, there was a program but it has been discontinued

(4) \_\_\_\_\_ No

36. Has your employer ever asked you to submit a urine sample to be tested for the presence of drugs?

(1) \_\_\_\_ Yes

(2) \_\_\_\_ No

37. In the past 12 months, has your employer randomly selected employees at your level for urine tests for the presence of drugs?

(1) \_\_\_\_ Yes

(2) \_\_\_\_ No

38. To what extent does the possibility of mandatory urine testing have an influence on your marijuana use?

1

2

3

4

5

No

Moderate

Very

Strong

Influence

Influence

Influence

## **Appendix C**

## Temptation Questionnaire

A. Instructions: Below is a list of situations and feelings in which you might experience in everyday living. They are situations that may be associated with using marijuana for some people. We would like you to tell us how tempted to use marijuana you would be in each situation. You can do this by rating each item on a 7 point scale, where “1” means you would not be tempted to use marijuana at all and “7” means you would be extremely tempted to use marijuana. If a situation is unfamiliar to you, try to imagine how tempted you might be in it. You can choose any number from 1 to 7.

1 = not tempted at all    7 = extremely tempted

**How tempted would you be to use marijuana if you were:**

**Temptation  
Rating**

- |     |   |       |
|-----|---|-------|
| 1.  | Having to do some monotonous work                         | _____ |
| 2.  | <b>Wanting to feel more confident</b>                     | _____ |
| 3.  | On vacation   | _____ |
| 4.  | Seeing someone else using marijuana and enjoying it       | _____ |
| 5.  | <b>Feeling depressed or worried</b>                       | _____ |
| 6.  | Drinking alcohol  | _____ |
| 7.  | Feeling like celebrating some good news or accomplishment | _____ |
| 8.  | <b>Feeling frustrated</b>                                 | _____ |
| 9.  | <b>Wanting to feel better about yourself</b>              | _____ |
| 10. | <b>Feeling angry about something or someone</b>           | _____ |
| 11. | In a pleasant social situation                            | _____ |
| 12. | Having some time to yourself free from responsibilities   | _____ |
| 13. | Using other drugs recreationally                          | _____ |
| 14. | At a party where people were using marijuana              | _____ |
| 15. | <b>Feeling embarrassed</b>                                | _____ |
| 16. | With a spouse or close friend who was using marijuana     | _____ |
| 17. | <b>In an uncomfortable social situation</b>               | _____ |
| 18. | Offered marijuana by someone                              | _____ |



## **Appendix D**

## Frequency Questionnaire

B. Instructions: Below is a list of situations and feelings that appeared in Part A on the previous page. This time we would like you to give us an idea of how often you experience these situations or feelings. Taking this past month as an example, please rate how often you experience each situation or feeling on the following 7-point scale.

7 – experience it at least once daily during the past month

6 – have experience it several times a week during past month

5 – have experienced it once or twice a week during past month

4 – have experienced it about once a month

3 – have experienced it several times in past year, but less than once a month

2 – have experienced it once or twice in past year

1 – have not experienced it in past year

**Approximately how often:**

**Frequency  
Rating**

- |     |  |       |
|-----|--|-------|
| 1.  | Did you have to do some monotonous work                        | _____ |
| 2.  | <b>Did you want to feel more confident</b>                     | _____ |
| 3.  | Were you on vacation   | _____ |
| 4.  | Did you see someone else use marijuana and enjoy it            | _____ |
| 5.  | <b>Did you feel depressed or worried</b>                       | _____ |
| 6.  | Did you drink alcohol  | _____ |
| 7.  | Did you feel like celebrating some good news or accomplishment | _____ |
| 8.  | <b>Did you feel frustrated</b>                                 | _____ |
| 9.  | <b>Did you want to feel better about yourself</b>              | _____ |
| 10. | <b>Did you feel angry about something or someone</b>           | _____ |
| 11. | Were you in a pleasant social situation                        | _____ |
| 12. | Did you have some time to yourself free from responsibilities  | _____ |
| 13. | Did you use other drugs recreationally                         | _____ |
| 14. | Were you at a party where people were using marijuana          | _____ |
| 15. | <b>Did you feel embarrassed</b>                                | _____ |
| 16. | Were you with a spouse or close friend who was using marijuana | _____ |
| 17. | <b>Were you in an uncomfortable social situation</b>           | _____ |
| 18. | Were you offered marijuana by someone                          | _____ |

## **Appendix E**

### Situational Self-Efficacy Scale

C. Instructions: Below is a list of situations and feelings that appeared on the previous two pages. On this page, we would like you to tell us how confident you are that you could resist the temptation to use marijuana in each situation, assuming that marijuana was available to you. It is not necessary that your confidence ratings match the temptation ratings which you gave in the first section. That is, you may feel very confident that you could do something to resist that temptation. It is also possible that you could be very tempted to use marijuana in a certain situation and not feel very confident that you could resist the temptation. You can tell us how confident you are that you could resist the temptation to use marijuana in the following situation by rating each item on a 1 – 7-point scale, where “1” means you are not at all confident and “7” means you are extremely confident. 1 = not at all confident 7 = extremely confident

How confident are you that you could resist the temptation to use marijuana if you were:	Confidence Rating
1. Having to do some monotonous work	_____
2. <b>Wanting to feel more confident</b>	_____
3. On vacation	_____
4. Seeing someone else using marijuana and enjoying it	_____
5. <b>Feeling depressed or worried</b>	_____
6. Drinking alcohol	_____
7. Feeling like celebrating some good news or accomplishment	_____
8. <b>Feeling frustrated</b>	_____
9. <b>Wanting to feel better about yourself</b>	_____
10. <b>Feeling angry about something or someone</b>	_____
11. In a pleasant social situation	_____
12. Having some time to yourself free from responsibilities	_____
13. Using other drugs recreationally	_____
14. At a party where people were using marijuana	_____
15. <b>Feeling embarrassed</b>	_____
16. With a spouse or close friend who was using marijuana	_____
17. <b>In an uncomfortable social situation</b>	_____
18. Offered marijuana by someone	_____

## **Appendix F**

## Coping Self-Efficacy Scale

Instructions: People differ in how they handle situations in which they are tempted to use marijuana. Please imagine yourself in the situation below whether it applies to your habits or not. The situation is followed by a list of possible responses to being tempted to use marijuana in the situation. Using the 1-5 point scale that follows the items, we would like you to circle the number that indicates **how confident you are that you would be able to think or act as indicated by the statement.**

**If I was feeling depressed or worried I would be able to:**

1=Not at all Confident    5=Very Confident

a.	Anticipate and avoid the situation or feeling in the first place.	1	2	3	4	5
b.	Tell people I was with not to offer me marijuana or ask them to help me resist the urge to use in some other way.	1	2	3	4	5
c.	Remember to think that one joint always leads to another and I don't want to relapse.	1	2	3	4	5
d.	Relax, exercise, take a hot bath, or do something else that would make me feel good.	1	2	3	4	5
e.	Remember to think about the effect of my using marijuana on other people.	1	2	3	4	5
f.	Substitute something else for using marijuana.	1	2	3	4	5
g.	Remind myself how much I had achieved by not using marijuana and that I didn't want to spoil it	1	2	3	4	5
h.	Tell myself to use my willpower to resist the urge to use marijuana.	1	2	3	4	5
i.	Make myself leave or get out of the situation.	1	2	3	4	5
j.	Remember to think about the consequences of using marijuana on my health.	1	2	3	4	5
k.	Get involved in some other activity to distract myself.	1	2	3	4	5

Instructions: How confident are you that you would be able to engage in the responses below if you were in the following situation?

**If I was with my spouse or close friend who was using marijuana I would be able to:**

1=Not at all Confident 5=Very Confident

a.	Anticipate and avoid the situation or feeling in the first place.	1	2	3	4	5
b.	Tell people I was with not to offer me marijuana or ask them to help me resist the urge to use in some other way.	1	2	3	4	5
c.	Remember to think that one joint always leads to another and I don't want to relapse.	1	2	3	4	5
d.	Relax, exercise, take a hot bath, or do something else that would make me feel good.	1	2	3	4	5
e.	Remember to think about the effect of my using marijuana on other people.	1	2	3	4	5
f.	Substitute something else for using marijuana.	1	2	3	4	5
g.	Remind myself how much I had achieved by not using marijuana and that I didn't want to spoil it	1	2	3	4	5
h.	Tell myself to use my willpower to resist the urge to use marijuana.	1	2	3	4	5
i.	Make myself leave or get out of the situation.	1	2	3	4	5
j.	Remember to think about the consequences of using marijuana on my health.	1	2	3	4	5
k.	Get involved in some other activity to distract myself.	1	2	3	4	5

Instructions: How confident are you that you would be able to engage in the responses below if you were in the following situation?

**If I was feeling like celebrating some good news or accomplishment I would be able to:**

1=Not at all Confident 5=Very Confident

a.	Anticipate and avoid the situation or feeling in the first place.	1	2	3	4	5
b.	Tell people I was with not to offer me marijuana or ask them to help me resist the urge to use in some other way.	1	2	3	4	5
c.	Remember to think that one joint always leads to another and I don't want to relapse.	1	2	3	4	5
d.	Relax, exercise, take a hot bath, or do something else that would make me feel good.	1	2	3	4	5
e.	Remember to think about the effect of my using marijuana on other people.	1	2	3	4	5
f.	Substitute something else for using marijuana.	1	2	3	4	5
g.	Remind myself how much I had achieved by not using marijuana and that I didn't want to spoil it	1	2	3	4	5
h.	Tell myself to use my willpower to resist the urge to use marijuana.	1	2	3	4	5
i.	Make myself leave or get out of the situation.	1	2	3	4	5
j.	Remember to think about the consequences of using marijuana on my health.	1	2	3	4	5
k.	Get involved in some other activity to distract myself.	1	2	3	4	5



## **Appendix G**

## Brief Symptom Inventory

Instructions: Below is a list of problems that people sometimes have. Please read each one carefully, and circle the number to the right that best describes HOW MUCH THAT PROBLEM HAS DISTRESSED OR BOTHERED YOU DURING THE PAST 7 DAYS INCLUDING TODAY. Circle only one number for each problem and do not skip any items. If you change your mind, erase your first mark carefully. Read the example below before beginning, and if you have any question please ask about them.

### Example

**How much were you distressed by:**

Example	Not at all	A little bit	Moderately	Quite a bit	Extremely
How much were you distressed by:					
1. Bodyaches	0	1	2	3	4

**How much were you distressed by:**

How much were you distressed by:	Not at all	A little bit	Moderately	Quite a bit	Extremely
1. Nervousness or shakiness inside	0	1	2	3	4
2. Faintness or dizziness	0	1	2	3	4
3. The idea that someone else can control your thoughts	0	1	2	3	4
4. Feeling others are to blame for most of your troubles	0	1	2	3	4
5. Trouble remembering things	0	1	2	3	4
6. Feeling easily annoyed or irritated	0	1	2	3	4
7. Pains in heart or chest	0	1	2	3	4
8. Feeling afraid in open spaces	0	1	2	3	4
9. Thoughts of ending your life	0	1	2	3	4
10. Feeling that most people cannot be trusted	0	1	2	3	4
11. Poor appetite	0	1	2	3	4
12. Suddenly scared for no reason	0	1	2	3	4
13. Temper outbursts that you could not control	0	1	2	3	4
14. Feeling lonely even when you are with people	0	1	2	3	4
15. Feeling blocked in getting things done	0	1	2	3	4
16. Feeling lonely	0	1	2	3	4
17. Feeling blue	0	1	2	3	4
18. Feeling no interest in things	0	1	2	3	4
19. Feeling fearful	0	1	2	3	4
20. Your feelings being easily hurt	0	1	2	3	4
21. Feeling that other people are unfriendly or dislike you	0	1	2	3	4
22. Feeling inferior to others	0	1	2	3	4
23. Nausea or upset stomach	0	1	2	3	4
24. Feeling that you are watched or talked about by others	0	1	2	3	4
25. Trouble falling asleep	0	1	2	3	4

**How much were you distressed by:**

	Not at all	A little bit	Moderately	Quite a bit	Extremely
26. Having to check and double check what you do	0	1	2	3	4
27. Difficulty making decisions	0	1	2	3	4
28. Felling afraid to travel on buses, subways, or trains	0	1	2	3	4
29. Trouble getting your breath	0	1	2	3	4
30. Hot or cold spells	0	1	2	3	4
31. Having to avoid certain things, places, or activities because they frighten you	0	1	2	3	4
32. Your mind going blank	0	1	2	3	4
33. Numbness or tingling in parts of your body	0	1	2	3	4
34. The idea that you should be punished for your sins	0	1	2	3	4
35. Feeling hopeless about the future	0	1	2	3	4
36. Trouble concentrating	0	1	2	3	4
37. Feeling weak in parts of your body	0	1	2	3	4
38. Feeling tense or keyed up	0	1	2	3	4
39. Thoughts of death or dying	0	1	2	3	4
40. Having urges to beat, injure, or harm someone	0	1	2	3	4
41. Having urges to break or smash things	0	1	2	3	4
42. Feeling very self-conscious than others	0	1	2	3	4
43. Feeling uneasy in crowds	0	1	2	3	4
44. Never feeling close to another person	0	1	2	3	4
45. Spells of terror or panic	0	1	2	3	4
46. Getting into frequent arguments	0	1	2	3	4
47. Feeling nervous when you are left alone	0	1	2	3	4
48. Others not giving you proper credit for your achievements	0	1	2	3	4
49. Feeling so restless you couldn't sit still	0	1	2	3	4
50. Feelings of worthlessness	0	1	2	3	4
51. Feeling that people will take advantage of you if you let them	0	1	2	3	4
52. Feelings of guilt	0	1	2	3	4
53. The idea that something is wrong with your mind	0	1	2	3	4

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**JOSEPHINE M. DEMARCE, B.A.**

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**EDUCATION**

- 2001 – Present** Virginia Polytechnic Institute and State University,  
Blacksburg, Virginia.  
Degree expected: Doctor of Philosophy  
Program: Clinical Psychology  
Specialization: Clinical-Adult Psychology
- 1996 – 1999** Oberlin College, Oberlin, Ohio  
Bachelor of Arts in Biopsychology
- Summer 1999** George Mason University, Fairfax, Virginia
- Summer 1998** Davidson College, Davidson, North Carolina

**CLINICAL POSITIONS**

- 5/03-present** Substance Abuse Rehabilitation Treatment Program for inpatients, Salem Veteran's Affairs Medical Center, Salem, VA. Extern. Duties: Conduct therapy, conduct assessments, attend weekly treatment team meetings, and attend supervision meetings. Special assignments included:
- Facilitator of an inpatient cognitive-behavioral relapse prevention group, consisting of between three and seven individuals (open enrollment). Facilitator of a group focused on depression and another aftercare group for women.
  - Conducted various assessments, including screening for program admission, intake for general symptomatology, neuropsychological, cognitive, and symptom-focused (Obsessive-Compulsive Disorder, Bipolar Disorder, Posttraumatic Stress Disorder, thought disorder)
- Supervisors: Steven J. Lash, Ph.D. and Jennifer Burden, Ph.D.
- 8/02-5/03** Department of Psychology, Virginia Polytechnic Institute and State University, Blacksburg, VA. Graduate Clinician. Duties: Conduct therapy and attend supervision meetings with faculty supervisor and other clinicians. Special assignments included: Group therapy at Cook Counseling Center. One group was titled "Healthy Relationships" and focused on issues about abusive relationships. The second group was a general process group.
- Supervisors: Richard Eisler, Ph.D.  
Felicia Brown-Anderson, M.A.  
Christine Dennis, M.A.

- 5/02-8/02** Department of Psychology, Virginia Polytechnic Institute and State University, Blacksburg, VA. Graduate Clinician. Duties: Conduct therapy, and attend supervision meetings with faculty supervisor and other clinicians.
- Supervisor: Lee Cooper, Ph.D.
- 12/01 – 5/02** Department of Psychology, Virginia Polytechnic Institute and State University, Blacksburg, VA. Graduate Clinician. Duties: Conduct therapy, and attend supervision meetings with faculty supervisor and other clinicians.
- Supervisor: George Clum, Ph.D.
- 01/01 – 07/01** Pathways, Fairfax, VA. Mental Health Counselor/Case Manager. Duties: work in a group home setting with 8 adults males with chronic schizophrenia, attend weekly treatment team meetings, and attend weekly supervision, administration and documentation of medication, write daily progress notes, write 2 week goal updates, and write 6 month service plans, responsible for daily care issues, provide transportation, work with case managers a social center the men attend
- Supervisor: Alison Lanham, MS, Program Director
- 03/00 - 08/01** Fellowship Health Resources, Arlington, VA. Relief Mental Health Counselor. Duties: work as needed in 2 different group home settings, one house is described below, the other house had four males with various chronic mental disorders (schizophrenia, OCD), write daily progress notes, administration and documentation of medications, provide transportation, responsible for daily care issues
- Supervisor: Lyanne Trumbull, LCSW, Program Director
- 03/00 - 09/01** Fellowship Health Resources, Arlington, VA. Mental Health Counselor. Duties: work full time in a group home setting with 4 adult women with various chronic mental disorders (schizophrenia, borderline personality disorder, dependent personality disorder), attend weekly supervision, administration and documentation of medication, write daily and monthly progress notes, responsible for daily care issues, provide transportation
- Supervisor: Lyanne Trumbull, LCSW, Program Director
- 05/99 - 03/00** Northern Virginia Mental Health Institute, Fairfax, VA. Psychiatric Technician. Duties: attend treatment planning meetings, escort patients to

groups and medical appointments, assist with activities of daily living, assist occupational and recreational therapists, take vital signs, document patient progress and behavior, work with patients deemed Not Guilty by Reason of Insanity and become familiar with policies of the Forensic Review Board in Virginia.

Supervisors: Nancy MaGary, RN, Unit Supervisor  
Bethany Dusenberry, RN, Unit Supervisor

**05/98 - 08/98**

Broughton Hospital, Morganton, NC. Psychology Intern. Duties: work on an adolescent unit, write a case study on a 17-year-old patient, direct an anger management group once a week, assist a licensed clinical psychologist with group therapy sessions, attend family and individual therapy sessions, supervise outings for patients, mediate issues among patients

Supervisor: Richard Whited, Ph.D.

## **RESEARCH POSITIONS**

**8/01 – present**

Department of Psychology, Virginia Polytechnic Institute and State University, Blacksburg, VA. Research Assistant. Duties:

- Assisted in development of study protocol, manual, assessment battery, administered assessments, ran and coordinated quality assurance meetings every other week in order to review tapes. Developed data entry screens, entered data, analyzed data, and contributed to the writing of a new grant (Lash and Stephens grant).
- Assisted in development of data entry screens for the MCU2, a NIDA funded study comparing the effectiveness of a two- vs. a six-session motivational enhancement therapy. Participated in weekly then bi-weekly conference calls related to implementation of the study, provided feedback.
- Participated in research team meetings related to the development and implementation of the study (Lash and Stephens grant, MCU2, TMCU, PRN).
- Assisted in the development of study protocols for the PRN, a NIDA funded study comparing two treatments designed to aid people who wish to stop using marijuana.
- Contributed to the writing of a new grant examining marijuana use cessation in adolescents.

Supervisor: Robert S. Stephens, Ph.D.

**10/01-present**

Department of Psychology, Virginia Polytechnic Institute and State University, Blacksburg, VA. Dissertation Aid. Duties:

- Trained in the implementation of an advanced level graduate student's dissertation procedures. Ran group sessions for data collection from subjects both supervised and independently.

Supervisor: Stephanie Adams Fearer, MS

**01/99**

Oberlin College Neuroscience Department, Oberlin, OH. Undergraduate research assistant. Research area: Learning and Memory. Duties: assist in design of study, implement the study, care for rats, administer injections, collect and assist in analyzing data.

Supervisor: Albert Borroni, Ph.D.

## **TEACHING POSITIONS**

**1999-2000**

Langley School, McLean, VA. Substitute Teacher. Duties: Work with students ranging from pre-kindergarten through the eighth grade, carry out lesson plans, and supervise children.

Supervisor: Judy Harbolic, Substitute Coordinator

## **Conference Presentations**

Lash, S. J., Stephens, R. S., Burden, J. L., Grabow, S. C., Horner, R. D., Walker, N. R., DeMarce, J., Jones, M., and Lozano, B. (2002, November). Contracting, prompting, and reinforcing substance abuse aftercare attendance: Three month outcome of a VA HSR&D clinical trial. Poster session presented at the annual meeting of the Association for the Advancement of Behavior Therapy, Reno, NV.

Walker, N. R., DeMarce, J., Jones, M., Lozano, B., Stephens, R. S., Lash, S. J., and Burden, J. L. (2002 November). Development of an aftercare self-efficacy questionnaire: Validity and ability to predict aftercare attendance. Poster session presented at the annual meeting of the Association for the Advancement of Behavior Therapy, Reno, NV.

## **AWARDS**

**2002 – 2003**

Graduate Research Assistantship (full tuition waiver)

**2001 – 2002**

Graduate Research Assistantship (full tuition waiver)

**GROUP AFFILIATIONS**

**2003 – present**      Association for the Advancement of Behavior Therapy, student member