

The Effect of Goal Setting on Marijuana Treatment Outcomes: the Role of Self-Efficacy

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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 investigate the role of self-efficacy in goal setting and treatment outcomes based on self-stated goals (abstinence or moderation) for marijuana use. Measures of marijuana use, treatment goal, and self-efficacy for achieving one's goal were used. Goal choice was shown to influence treatment outcome such that, participants were more likely to achieve outcomes consistent with their treatment goal. The findings suggest that self-efficacy for goal achievement is more strongly related to outcomes for those with abstinence treatment goals, but appears to exert some effect across both goal types.

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While there is a long history of research investigating treatment goals and outcomes in the alcohol literature, there has been little or no focus on these issues in relation to other drugs of abuse. The present study attempts to fill this gap in the literature by extending research on self-selected treatment outcome goals to illicit drugs. The focus will be on the determinants of treatment goal choice (abstinence or moderation) and treatment outcomes for marijuana use based on treatment goal choice. Additionally, the social cognitive theory construct of self-efficacy will assist in understanding changes in goals as they relate to treatment outcomes. What follows is a brief description of the history associated with moderate drinking and the importance of goals in substance abuse treatment. Subsequently, a review of the literature on treatment goals in the alcohol field will be presented as a basis for understanding treatment goal issues regarding marijuana use.

Traditionally, professionals aligning with a disease conceptualization of alcoholism have emphasized permanent loss of control over drinking as a hallmark characteristic of persons addicted to alcohol (Marlatt, 1983). According to this view, total abstinence from alcohol is the only viable treatment for alcoholism. The landmark work of Jellinek and Davies in the early 1960s challenged this view and generated scientific inquiry into the potential for some persons diagnosed as alcoholic to engage in periods of moderate drinking (Miller, 1983; Davies, 1962; Jellinek, 1960).

Today, most professionals and researchers in the field acknowledge the occurrence of moderate drinking by some alcoholics; however, there still remains uncertainty regarding consistent predictors of controlled use outcomes. Currently, much of the controversy revolves around whether there is justification for explicitly providing persons a choice regarding the outcome goals and methods of treatment that support moderation (Rosenberg & Davis, 1994). Understandably, the debate over these issues has had implications for how mental health professionals conduct substance abuse treatment. Specifically, mental health professionals may have differing views on appropriate treatment approaches and goals for treatment based on their conceptualization of substance dependence.

In an attempt to address issues regarding appropriate substance abuse treatment goals, some authors have emphasized the importance of matching clients to outcome goals that are consistent with their abilities and beliefs (Marlatt, 1983; Miller, 1985;

Rosenberg, 1993). Accordingly, the provision of goal choice and goal setting are thought to be factors that serve to increase motivation for behavior change (Miller, 1985). This perspective relies on aspects of social cognitive theory, which predict that persons will be more motivated to achieve goals that they select rather than goals imposed by others (Sobell, Sobell, Bogardis, Leo, & Skinner, 1992; Bandura, 1986).

Research on goals in alcohol treatment has mainly taken three forms. One group of studies, referred to as randomized controlled trials, involves random assignment of participants to one of two goal conditions. Randomized controlled trials can provide an assessment of treatment outcome as a function of assigned goals; however, they do not provide an understanding of factors associated with an individual's treatment goal preference. A second group of studies focuses solely on identifying individual characteristics associated with those who choose either abstinence or moderation treatment goals. Finally, there are studies that investigate treatment outcome as a function of goal choice. What follows is a review of the literature in each of these domains.

As noted earlier, some researchers have attempted to uncover the impact of goals on treatment outcome by conducting studies in which individuals are randomly assigned to one of two goal conditions, abstinence or controlled drinking. Whereas Maisto et al. (1980) reported that assignment to a controlled drinking goal was associated with more controlled drinking days at a 2-year follow-up, Sanchez-Craig, Annis, Bornet, and MacDonald (1984) failed to find any significant differences between abstinent or controlled drinking treatment groups at follow-up. It appears that although participants assigned to an abstinent goal had more severe abuse during the initial treatment phase, both treatment groups were equally successful in achieving moderate levels of drinking during the 2-year follow-up period (Sanchez-Craig et al. 1984; Sanchez-Craig, 1980).

A possible source of discrepancy between these studies may be that in the study by Sanchez-Craig and colleagues (1984) the majority of participants assigned to the abstinence treatment group rejected an abstinence goal (23 out of 35). This may have been an indication that some participants maintained "personal goals" for controlled drinking, not abstinence, which may assist in explaining the similar drinking patterns of the two treatment groups. The fact that some individuals reject assigned treatment goals raises the importance of understanding that individuals may select personal goals regardless of treatment orientation. Furthermore, it underscores the need for a better

understanding of factors associated with goal choice and the implications of goal choice on treatment outcomes. Perhaps this is an indication that some individuals would fare better in programs in which they could choose their treatment goal.

As mentioned earlier, researchers have attempted to discover individual characteristics predictive of preferences for either abstinence or moderation treatment goals. Kilpatrick et al. (1978) failed to identify any differences among participants as a function of their treatment goal choice. However, other studies have reported that, compared with individuals choosing an abstinent goal or having successful abstinent outcomes, controlled drinkers are characterized as being younger (Hodgins, Leigh, Milne, & Gerrish, 1997; Booth, Dale, & Ansari, 1984; Heather & Robertson, 1981), having lower level of physical dependence and severity of problems (Adamson & Sellman, 2001; Hodgins et al., 1997; Ojehagen & Berglund, 1989; Finney & Moos, 1981; Heather & Robertson, 1981), having less chronicity of alcohol problems (Maisto, Sobell, & Sobell, 1980; Pachman et al., 1978), and having a personal belief that controlled drinking is possible (Pachman et al., 1978).

Furthermore, individuals who choose controlled drinking goals or who have successful controlled drinking outcomes have also been characterized as being more psychologically and socially stable (Nordstrom & Berglund, 1987), having lower motivation to change (Adamson & Sellman, 2001), unlikely to have attempted a period of total abstinence or have had briefer periods of abstinence (Elal-Lawrence, Slade, & Dewey, 1986), and having less contact with Alcoholics Anonymous or other treatment services (Hodgins et al., 1997; Ojehagen & Berglund, 1989; Elal-Lawrence, Slade, & Dewey, 1987; Elal-Lawrence et al., 1986; Booth et al., 1984; Finney & Moos, 1981; Heather & Robertson, 1981).

From this review it becomes apparent that attempts to distinguish characteristics of individuals choosing either an abstinent or moderation goal have resulted in a wealth of descriptors, but there remains some uncertainty as to which are consistently predictive. In general, it appears that factors such as lower level of physical dependence and severity of negative consequences, less chronicity of alcohol problems, and limited exposure to treatment services or previous attempts at abstinence, are most consistently associated with a controlled drinking goal choice and successful controlled drinking outcomes. In fact, a review by Heather and Robertson (1981) noted that these same conditions were

reliably associated with controlled drinking. However, it should be noted that some researchers have reported that measures of severity of dependence were not associated with outcome (Elal-Lawrence et al., 1986; Maisto et al., 1980) and that age failed to predict controlled drinking outcomes (Nordstrom & Berglund, 1987).

With respect to treatment outcome there have been inconsistent findings regarding the influence of goal choice. Booth et al. (1984) found that although there were no significant outcome differences between controlled drinking and abstinence choosers, goal choice at discharge was predictive of successful achievement of that goal one year later. Likewise, Elal-Lawrence et al. (1986, 1987) found that initial goal choice was not related to outcome, but goal choice at discharge predicted outcomes during follow-up.

Ojehagen and Berglund (1989) failed to find significant differences in the number of heavy drinking days during a 2-year outpatient program as a function of goal choice. However, patients with a stable abstinence goal drank more during heavy drinking days than patients with controlled drinking goals. Two additional studies (Adamson & Sellman, 2001; Booth, Dale, Slade, & Dewey, 1992) failed to discover any differences in treatment outcome as a function of goal choice. In contrast to studies that did not find differential outcomes, Hodgins et al. (1997) reported improved outcomes for individuals with a final goal choice of abstinence. Those choosing abstinence over moderation reported fewer intoxicated days, more nonproblem days (abstinent or fewer than 4 drinks), and were more often placed in the abstinent and successful outcome categories at 6 and 12-month follow-up. Unfortunately, as Adamson and Sellman (2001) point out, the data from Hodgins et al. (1997) do not allow for interpretation of rates of successful moderate drinking as distinct from abstinence.

Comparison across these studies is made difficult given the methodological differences among them. While one study found that participants choosing abstinence over moderation had more favorable outcomes (Hodgins et al., 1997), another study reported that individuals with a stable abstinent goal drank more during heavy drinking days than patients with controlled drinking goals (Ojehagen & Berglund, 1989). Despite a lack of evidence clearly supporting either abstinence or moderation as a superior treatment goal, a number of studies have indicated an association between treatment goal and subsequent achievement of that goal (Maisto et al., 1980; Booth et al., 1984; Elal-Lawrence et al., 1986, 1987). Unfortunately, all the research concerning treatment goal

preferences and outcomes has centered on alcohol use and therefore, limits our progress in understanding the nature and treatment of other drugs of abuse.

In recent years researchers have been interested in investigating the utility of self-efficacy or subjects' perceived ability to avoid or reduce substance use. According to social cognitive theory (Bandura, 1986), self-efficacy judgments presumably take into account previous attempts in modifying behavior, situation barriers to change, social supports for change, and the influence of the individual's current emotional state on their ability to change behavior. Studies have demonstrated the utility of (posttreatment) self-efficacy judgments to predict outcomes during a follow-up period for cigarette smoking (Baer, Holt, & Lichtenstein, 1986; Condiotte & Lichtenstein, 1981; Gooding & Glasglow, 1985), alcohol consumption (Sitharthan & Kavanagh, 1990), and pre- and posttreatment self-efficacy for marijuana smoking (Stephens, Wertz, & Roffman, 1995; Stephens, Wertz, & Roffman, 1993).

Another area of interest with respect to self-efficacy is that of goal systems and performance motivation. One source of cognitive motivation proposed by Bandura (1977) originates from internal standards and self-evaluations of one's performance in relation to those standards. However, the self-evaluative process via internal comparison requires both personal standards and knowledge of the level of one's performance (Bandura & Cervone, 1983). Depending on one's perception of his/her efficacy to achieve a set goal, negative discrepancies can either be motivating or discouraging. It is believed that individuals with low self-efficacy will more likely become discouraged in response to failure, whereas those with greater confidence in their ability to achieve their goal would be more likely to intensify their efforts (Bandura & Cervone, 1983).

Of particular relevance here is the influence of self-efficacy on goal setting and the effects of perceived performance on subsequent self-efficacy judgments and goal setting. To the extent that persons perceive their performance to be falling markedly short of their goal and subsequently judge the goal to be beyond their capabilities, they will be more likely to lower their standard and demand less of themselves (Bandura & Cervone, 1983). Similarly, perceptions of one's performance as exceeding a goal are likely to bolster self-efficacy and lead to increments in goal setting.

Despite studies investigating the effects of self-efficacy on goal systems and performance (Bandura & Cervone, 1983), and the role of self-efficacy in predicting

substance use outcomes (Stephens et al., 1995; Stephens et al., 1993; Sitharthan & Kavanagh, 1990; Baer et al., 1986; Gooding & Glasglow, 1985; Condiotte & Lichtenstein, 1981), there have not been any studies focusing on the influence of self-efficacy and goal achievement on changes in treatment goals. The current study will investigate predictions from self-efficacy theory as they pertain to revision of treatment goals during the treatment period.

There is reason to believe that many of the findings from the alcohol literature should extend to other drug use given the commonalities of use, treatment methods, and overall similar treatment outcomes across substances (Marlatt & Gordon, 1985). To the author's knowledge there are no studies that have investigated treatment goals and outcomes for illicit drug use. Thus, there is a need to extend this research from the alcohol field to illicit drugs and empirically determine which treatment goals are appropriate for which individuals.

There has been limited empirical research on treatment of marijuana use disorders, which is surprising given that marijuana has long been the most frequently used illicit drug in the United States. According to the 2002 National Survey on Drug Use and Health (NSDUH) there were 14.6 million marijuana users, aged 12 years or older, who smoked in the past month and of those 4.8 million individuals reported smoking marijuana on 20 or more days in the past month (SAMHSA 2002). Lastly, of persons using marijuana in the past year, about 12.2 percent used it on a daily or almost daily basis in the past 12 months (SAMHSA, 2002). These findings illustrate that while there appears to be a subgroup of heavy marijuana users, there are many more persons who use marijuana moderately.

Given the potential for dependence on marijuana and its classification as an illicit drug, it is reasonable to expect controversy surrounding the practice of offering moderation as a viable treatment goal. It should be noted that despite the legal issues surrounding marijuana there remain a considerable number of individuals who continue to use marijuana. Furthermore, data from the most recent NSDUH indicate that many individuals who use marijuana are moderate users. Anecdotally, many marijuana users approaching treatment would prefer a moderation goal, or to have a choice regarding treatment goals. For these reasons it seems reasonable to explore the potential of moderation as a treatment option; however, exploration into the determinants of goals

choice and the effect of goals on treatment outcome is needed to assess the merits of this approach.

While there is variability in the way in which moderate alcohol consumption has been defined in the literature, most studies typically specify certain quantified limits per drinking occasion and stipulate that use results in no identifiable negative consequences (Sobell & Sobell, 1987). In general, studies have defined moderate drinking as 4 or fewer standard drinks per day (e.g. Hodgins et al., 1997; Sitharthan & Kavanagh, 1990; Ojehagen & Berglund, 1989; Nordstrom & Berglund, 1987) and drinking on no more than 3-4 days each week (Sitharthan & Kavanagh, 1990), or not more than 6 drinks per day if the drinking was occasional (1-2 days) (Nordstrom & Berglund, 1987).

There is considerably more difficulty in arriving at a definition for moderate marijuana use, in part, because of the varying levels of toxicity found in marijuana and due to the nature of marijuana intoxication. Whereas one may ingest certain amounts of alcohol (e.g. 1-2 drinks per day) without experiencing acute effects of intoxication, marijuana consumption is such that acute effects of intoxication are generally experienced on each occasion of use. Therefore, in the current study we use data from users seeking treatment who wanted to reduce their use but did not want to become abstinent to inform our definition of moderation.

The present study has several objectives. The first objective is to extend findings from the alcohol literature to marijuana treatment by identifying individual characteristics of persons who choose either abstinence or moderation as their treatment goal. The second objective is to determine the impact of these chosen goals on treatment outcomes for marijuana use. Several studies on alcohol have indicated an association between treatment goal selection and subsequent achievement of that goal, particularly for treatment goals at discharge. The third objective is to identify individual characteristics that are predictive of abstinence or moderation outcomes. The fourth objective is to investigate the role of a social cognitive construct in the prediction of successful treatment outcomes based on goal choice. The final objective is to understand changes in goals across treatment and follow-up as they relate to success in modifying drug use and a theoretically predictive social cognitive construct. To the author's knowledge there have not been any previous studies that have investigated this association and while theory guides the hypothesis, much of this last inquiry is exploratory.

Hypothesis 1

On the basis of research with alcohol abusers, it is hypothesized that individuals with less chronicity of regular marijuana use, lower physical dependence, lower severity of negative consequences due their marijuana use, and few or no previous contacts with treatment services, will be more likely to choose moderation than abstinence as their initial treatment goal. Similarly, individuals who have had few or no previous attempts at quitting or have had only brief periods of abstinence in the past may be more likely to select an initial moderation goal.

Hypothesis 2

In terms of the influence of goal choice on treatment outcome, it is hypothesized that individuals who choose abstinence will be more likely to achieve abstinence than those who choose a moderation goal. Conversely, it is hypothesized that individuals who choose moderation will be more likely to have successful moderation outcomes than those who choose an abstinence goal. Given that a treatment period provides an opportunity to test one's ability to meet a specified goal and subsequently adjust one's behavior or goal, it is hypothesized that treatment goals chosen at the conclusion of treatment will be more influential on follow-up treatment outcome than initial goal choice.

Hypothesis 3

Embedded in this logic is the hypothesis that determinants of who chooses moderation as their treatment goal (i.e. less chronicity of regular marijuana use, lower physical dependence, lower severity of negative consequences due their marijuana use, few or no previous contact with treatment services, and limited attempts at quitting) will also be predictive of successful moderation outcomes.

Hypothesis 4

It is hypothesized that a critical factor for successful outcomes in general is the degree of one's self-efficacy for achieving the goal. Thus, a person who has higher self-efficacy for achieving the goal will be more likely to achieve that goal than someone who has lower self-efficacy for achieving the goal.

Hypothesis 5

Regarding inquiry into changes in treatment goals, it is hypothesized that participants will adjust their treatment goals as a function of their self-efficacy judgments

and based on recent performance, such that, individuals with low self-efficacy for achieving abstinence will change their goal from abstinence to moderation or non-moderation in response to a failed attempt at abstinence, whereas those with high self-efficacy will maintain their abstinence goal and increase their efforts to achieve this goal. Additionally, it is hypothesized that individuals with low self-efficacy for achieving moderation will change their goal from moderation to non-moderation in response to a failed attempt at moderation, whereas those with high self-efficacy will maintain their moderation goal and increase their efforts to achieve this goal.

Method

Participants

This paper is based on secondary analyses of a previously published treatment outcome study comparing an extended 14-session cognitive-behavioral group treatment and a brief 2-session individual motivational treatment for marijuana dependent adults (Stephens et al., 2000). Recruitment of participants was achieved through news stories, media announcements, and paid advertisements in local newspapers and on radio stations in the greater Seattle, Washington area. These recruitment efforts were intended to target adult marijuana users who wanted help quitting. Of the 601 treatment seeking respondents who were screened for participation, 183 were deemed ineligible for the following reasons: used marijuana less than 50 times in the last 90 days ($n = 24$), abused alcohol or other drugs in the past 90 days ($n = 149$), reported severe psychological distress ($n = 8$), or were involved in other formal treatment for marijuana abuse ($n = 2$). Of the 418 eligible participants, 127 were excluded because they did not complete pretreatment assessment and research protocols.

The final sample for this paper consists of the 291 participants who met eligibility criteria and completed the pretreatment assessment. These participants were mostly male (77%), Caucasian (95%), employed full-time (76%), and single (55%). They averaged 34.0 years of age ($SD = 6.85$) and had completed 14 years of education. At baseline they smoked marijuana on 75 ($SD = 18.54$) of the last 90 days and 94% met criteria for cannabis dependence based on responses to a checklist of dependence criteria (3rd ed., rev.; *DSM-III-R*; American Psychiatric Association, 1987).

Design

Participants were randomly assigned to one of three conditions. One condition, relapse prevention support groups (RPSGs; $n = 117$), was akin to a comprehensive outpatient treatment approach to marijuana cessation using cognitive-behavioral and social support processes. In a second condition, individualized assessment and advice (IAI; $n = 88$), therapists utilized motivational interviewing techniques and provided advice on cognitive-behavioral techniques for stopping marijuana use. This condition was modeled after the Drinker's Check-Up (Miller, Benefield, & Tonigan, 1993; Miller & Sovereign, 1989). A final condition was a delayed treatment control (DTC; $n = 86$). Stephens et al. (2000) address ethical concerns regarding a delayed treatment condition for persons seeking help in stopping their marijuana use. In the initial study participants were followed-up at 1, 4, 7, 13, and 16 months after random assignment. In doing so, RPSG and IAI participants were assessed at the end of treatment, 3 months posttreatment, and 12 months posttreatment allowing for comparison between the two conditions at common reference points. DTC participants were followed-up only at 4 months, which allowed for a no treatment comparison corresponding to the end of treatment for RPSG participants and 3 months posttreatment for IAI participants. The analyses for this paper will focus on data from baseline assessment and the 4-, 7-, -13, and 16-month follow-ups.

Procedures

Respondents to the media announcements, advertisements, or other recruitment sources were screened via telephone for age appropriateness, after which an orientation session was scheduled either in a small group or individual context. The orientation session involved a review of an informed consent form, which briefly described the treatment conditions and the nature of random assignment, the requirement of a \$60 deposit that would be refunded gradually at each follow-up and the request for a collateral informant who would be contacted at each of the follow-up assessments. Participants were informed that a Certificate of Confidentiality from the U.S. Department of Health and Human Services protected the confidentiality of their records.

Once participants signed the consent form they were asked to complete self-report questionnaires that assessed sociodemographic characteristics, drug use, psychiatric symptoms and psychological distress, and other psychosocial variables. The information from these questionnaires was used to determine eligibility. Eligible participants were

asked to return for a second session in which they completed additional self-report questionnaires assessing personal goals for future marijuana use, self-efficacy for avoiding marijuana use, and other psychosocial variables. While this baseline assessment was conducted in person, the follow-up questionnaires assessing marijuana, alcohol, other drug use and related psychosocial variables, were mailed to participants at each of the follow-up assessment points. Follow-up rates were 86%, 81%, 87 %, and 89% at the 4, 7, 13, and 16, month assessments, respectively.

Treatment Conditions

As mentioned earlier, the RPSG condition was similar to a comprehensive outpatient treatment approach to marijuana cessation utilizing cognitive-behavioral and social support processes. This condition consisted of 14 2-hour group sessions scheduled over a period of 4 months. The first 10 sessions occurred weekly, and the remaining 4 sessions took place every other week. During sessions 1-4 therapists attempted to build motivation for change by means of group discussions on consequences of use, advantages of stopping use, and listing reasons for quitting. At this point participants selected either a gradual reduction or a more abrupt quitting method, made public commitments to quit, sought support for quitting from others, and planned ways to cope with high-risk situations. A quit ceremony corresponding to the target quit date was conducted during the fourth session (i.e. fourth week) of each group. Sessions 5-10 involved building coping skills through the use of planned exercises and role-plays. Group discussion at this point focused on participants' experiences in high-risk situations and identification of alternative ways of coping with these situations. The final sessions, 11-14, used relapse prevention techniques to assist participants in identifying and coping with urges to return to use and negative attributions subsequent to a slip into marijuana use.

The IAI condition, modeled after the Drinker's Check-Up (Miller et al., 1993), consisted of two 90-minute individual sessions scheduled one month apart. In the first session the therapist provided feedback based on information collected from pretreatment questionnaires (e.g. frequency of use, problems related to use, reasons for quitting). The therapists also used motivational interviewing techniques, and provided advice regarding cognitive-behavioral techniques for stopping marijuana use. Therapists then worked with the participant to develop a plan for quitting, complete a quit contract, and identify precipitants to relapse. During the second session the therapist reviewed marijuana use

during the past month and used motivational interviewing to encourage success or rebuild motivation as needed. Additionally, the therapist and participant constructed a plan for maintaining (or working toward) abstinence.

Measures

Demographic information. Demographic information was obtained prior to treatment for each participant. This information included variables such as, age, gender, race, marital status, level of education, employment status, and legal status.

Marijuana use. Self-reported marijuana use during the past 90 days was assessed at baseline and each follow-up time point. The number of days of marijuana use during the entire period was converted to the average number of days per week for the purpose of establishing moderate use rates. Validity for this measure has been shown via correlations of self-reported use with collateral reports and urine screens (Stephens et al., 1995; Stephens et al., 2000).

Assessment of chronicity of marijuana use was achieved using three items administered at baseline which inquire about age at first marijuana use, total number of years of marijuana use, and age at first daily or near daily marijuana use.

Dependence symptoms and drug problems. Severity of drug dependence and drug problems for the past 90 days was assessed for marijuana at the baseline and each follow-up assessment. Marijuana dependence was assessed using an 11-item marijuana dependence scale (MDS) that was created based on dependence criteria in the *Diagnostic and Statistical Manual of Mental Disorders* (3rd ed., rev.; *DSM-III-R*; American Psychiatric Association, 1987). Slight changes in wording of the nine dependence criteria were necessary to improve readability when they were converted to self-report questionnaire items. The internal consistency of the MDS was adequate to excellent at all assessment points (mean alpha = .85).

Assessment of problems related to use of marijuana in the past 90 days was achieved using a list of 19 negative psychological, social, occupational, and legal consequences at each follow-up assessment. The problem list was adapted from severity instruments used for other drugs and modified based on prior research with marijuana users in treatment (Stephens et al., 1993, 1994). Endorsements of items were counted to create indices of the total number of problems (range = 0-19) for marijuana (mean alpha = .90).

Previous substance use treatment and experiences quitting. Assessment of previous substance use treatment was assessed at baseline and each follow-up time point using a list 16 items that inquired about the number of times a participant attended various types of treatment (e.g. Marijuana Anonymous, Alcoholics Anonymous) in the 12 months prior to assessment.

Assessment of previous experiences in quitting or reducing marijuana use was achieved with the use of three items administered at baseline. The items inquired about the number of previous attempts at quitting or reducing marijuana use and the duration of success in either quitting or reducing use.

Treatment goal. Treatment goal was assessed with a goal statement (GS) questionnaire administered at baseline and each of the follow-up assessments. At baseline participants were asked to specify their personal treatment goal: either “to not use marijuana at all,” or “to use marijuana only in certain ways,” at the end of the treatment program. At each follow-up assessment participants were again asked to specify their treatment goals for the period up to the next follow-up. If participants indicated a moderation goal (i.e. “to use marijuana only in certain ways”) the questionnaire directed them to specify the number of days they plan on using marijuana in an average week, number of times they will use on an average day, and how many days they will use marijuana before a period of at least one day of abstinence.

The GS contained an item that assessed self-efficacy for a participant’s stated goal. At baseline the item required participants to use a scale from 0-100 to rate how confident they feel in their ability to achieve their stated goal by the end of the treatment program, where 0 is “not at all confident” and 100 is “totally confident”. At each follow-up assessment participants were again asked to rate their confidence for achieving their treatment goal by the next follow-up.

Results

Table 1 displays percentages of participants who chose abstinence or moderation goals at each assessment. Slightly over seventy percent of the 291 participants indicated that abstinence was their goal at initial assessment. Participants choosing a goal other than abstinence were classified retrospectively as having moderation goals based on the number of days they planned on using marijuana in a given week. The definition of a moderation goal in the current study was based on the following data. Of the participants

choosing a goal other than abstinence at baseline, 96.4% defined their goal as using marijuana on no more than 3 days in a given week. Furthermore, when participants' average weekly marijuana use in the 90 days prior to baseline was compared to the weekly use specified as part of non-abstinent baseline goals it was apparent that a goal to use marijuana on no more than 3 days constituted a reduction in use for all participants with this goal. Lastly, data from another recent treatment outcome study of marijuana dependent adults indicated that those who were no longer experiencing problems after treatment were typically using 3 or fewer days per week (MTPRG). Therefore, we defined moderation based on this cutoff and participants who indicated that their goal was to use on 4 or more days per week were classified as having a non-moderation goal. The percentage of days and the number of times per day that participants planned on using marijuana in the future are listed separately in Table 1 for those who chose moderation versus non-moderation goals. Of participants choosing moderation goals consistent with using on 3 days or less per week, the vast majority further specified that they would use marijuana no more than 2 times per day. Although frequency of use per day was not incorporated in defining moderation, these data further suggest that the current definition of moderation captures reductions in the extent of daily use as well as the total numbers of days of use. It should be noted that Table 1 also shows that the percentage of participants choosing moderation and non-moderation goals increased across the follow-up period.

Hypothesis 1

In order to test the hypothesis that individual characteristics predict initial treatment goal choice, t-tests were performed comparing participants who chose abstinence versus moderation goals on baseline characteristics hypothesized to influence initial goal choice. It was hypothesized that individuals with less chronicity of regular marijuana use, lower physical dependence, lower severity of negative consequences due their marijuana use, and few or no previous contacts with treatment services, would be more likely to choose moderation than abstinence as their initial treatment goal. Similarly, it was hypothesized that individuals who have had few or no previous attempts at quitting or have had only brief periods of abstinence in the past would be more likely to select an initial moderation goal. Of the 291 participants who met eligibility criteria and completed the pretreatment baseline assessment, 282 were used in the analyses of

initial goal choice. Three participants were excluded from the analyses due to their reported goal exceeding the defined moderation cut-off of using marijuana on no more than 3 days in a given week. Six participants were excluded due to missing data on treatment goals at baseline.

As can be seen in Table 2, individuals with an initial goal of moderation reported significantly less physical dependence on marijuana and fewer problems related to marijuana use in the 90 days prior to baseline compared to those with an initial goal of abstinence. There were no significant differences on measures of chronicity of marijuana use: age of first marijuana use, years of marijuana use, and age of first daily marijuana use. Additionally, there were no significant differences on contacts with previous treatment: number of times attended AA-oriented treatment, marijuana treatment, or substance abuse treatment in general. Lastly, there were no significant differences on the number of previous quit attempts or length of quit time.

Variables from the above univariate analyses were converted to standardized z-scores and entered into a logistic regression with treatment goal at baseline as the dependent variable in order to examine multivariate prediction and whether there was a unique contribution from each variable. See Table 3 for results of all hypothesized predictors entered in the model. The logistic regression yielded a model in which severity of problems related to marijuana use in the 90 days prior to baseline was the only significant predictor of initial goal choice. Increased numbers of marijuana related problems were associated with and increased likelihood of choosing an abstinence goal. Although univariate analyses revealed that both severity of physical dependence and problems related to marijuana use were significant predictors of initial goal choice, multivariate analysis suggests that the latter is a better predictor of initial treatment goal choice.

Hypothesis 2

To test the influence of goal choice on treatment outcome at follow-up a chi-square test was performed on goal choice (abstinence or moderation) and subsequent treatment outcome (abstinent, moderate, non-moderate). Comparisons of the rates of abstinent versus moderate outcomes in the two goal choice groups were the primary focus of these comparisons. The analysis was repeated for goal choice at the assessment immediately preceding outcomes assessed at 4-, 7-, 13-, and 16-month follow-ups in

order to determine the robustness of goal choice as a predictor of outcome across the follow-up period. Only participants in the two active treatment conditions (IAI and RPSG) who had either an abstinence or moderation goals were used in these analyses; those with non-moderation goals were excluded from analyses. It was expected that a higher percentage of persons with an abstinence goal would have abstinent outcomes compared to those with a moderation goal. Similarly, a higher percentage of persons with a moderation goal were expected to have moderate outcomes compared to those with abstinence goals.

As can be seen in Table 4, results of the chi-square comparing baseline goal with 4-month treatment outcome revealed that individuals with an abstinence goal were significantly more likely to have abstinent outcomes rather than either moderate or non-moderate outcomes (47% versus 32.5% and 20.5%, respectively, $\chi^2(2, 163) = 14.25, p < .005$). Those with a moderation goal at baseline were more likely to have moderate outcomes rather than abstinent or non-moderate outcomes at the 4-month follow-up (54.3% versus 15.2% and 30.4%, respectively). Another way of looking at the data indicates that a greater percentage of individuals with an abstinence goal than those with a moderation goal were abstinent (47% versus 15.2%) at the 4-month follow-up. Conversely, a greater percentage of participants with a moderation rather than an abstinence goal at baseline achieved moderate outcomes at the 4-month follow-up (54.3% versus 32.5%). Lastly, 30.4% of individuals with a moderation goal compared to 20.5% with an abstinence goal had non-moderate outcomes at the 4-month follow-up.

The chi-square comparisons across all follow-ups revealed a similar pattern of significant results: 4-month goal compared with 7-month treatment outcome ($\chi^2(2, 120) = 22.17, p < .001$), 7-month goal compared with 13-month treatment outcome ($\chi^2(2, 105) = 29.79, p < .001$), and 13-month goal compared with 16-month treatment outcome ($\chi^2(2, 98) = 39.22, p < .001$). In general, individuals with an abstinence goal were more likely to have abstinent outcomes than moderate outcomes and those with a moderation goal were more likely to have moderate outcomes rather than abstinent outcomes. Inspection of the results across follow-up also shows that individuals with moderate goals were increasingly likely to have non-moderate outcomes compared to people with abstinent goals across the later follow-ups.

Hypothesis 3

In order to address the question of whether the individual characteristics hypothesized to influence initial treatment goal choice reliably predict outcome (abstinent, moderate, or non-moderate) at each follow-up, a oneway ANOVAs was performed comparing participants in each outcome group on measures of chronicity of regular marijuana use, level of physical dependence, severity of negative consequences due to their marijuana use, previous contact with treatment services, and prior experience in quitting marijuana use. Just as in hypothesis two, only participants in the two active treatment conditions were used in this analysis across baseline, 4-, 7-, 13-, and 16-month follow-ups. The results did not reveal significant differences between outcome groups on any of the hypothesized predictors at the 4-, 7-, 13-month follow-ups ($p > .05$). However, at the 16-month follow-up there was a significant effect for severity of physical dependence on treatment outcome ($F(2, 95) = 3.942; p < .05$). Post hoc comparison using Fisher's LSD revealed that participants in moderate outcome group at 16-months reported significantly fewer physical dependence symptoms at baseline than participants with non-moderate outcomes.

Hypothesis 4

In order to test the hypothesis that self-efficacy influences treatment outcome, participants were grouped into one of two categories based on success in meeting their treatment goals at each follow-up. Analyses were performed separately for abstinence and moderation goals in order to explore whether self-efficacy and goal importance differentially influence outcomes with respect to different types of goals. The successful abstinent group consisted of participants who had an abstinence goal and an abstinent outcome. The unsuccessful group was comprised of participants who had an abstinence goal and either a moderate or non-moderate outcome. The successful moderate group consisted of participants who had a moderation goal and a moderate outcome. The unsuccessful moderate group consisted of participants with a moderation goal and a non-moderate outcome. Participants with a moderation goal – abstinent outcome were not included in the analyses due to the small number of participants in this category at the 4- ($n = 7$), 7- ($n = 6$), 13- ($n = 0$), and 16-month ($n = 1$) follow-ups and questions about the proper classification of the outcome as successful or unsuccessful. Once participants were grouped based on success in achieving their goals for either abstinence or moderation, t-

tests were performed comparing participants who were successful versus unsuccessful in meeting their goals on measures of self-efficacy at the prior assessment point. Only participants in the two active treatment conditions who had either abstinence or moderation goals at a given assessment were used in these analyses across baseline, 4-, 7-, 13-, and 16-month follow-ups.

Table 5 presents means and standard deviation for self-efficacy for goal achievement at all assessment points. Results indicated that participants with abstinence goals and abstinent outcomes reported significantly greater efficacy for goal achievement at baseline and across follow-ups compared to those with abstinent goals and non-abstinent outcomes. Thus, there were significant effects of self-efficacy for one's goal on treatment outcomes by abstinence group: at baseline ($t(115) = -3.081, p < .005$), 4-months ($t(54.442) = -3.625, p < .005$), 7-months ($t(47.483) = -3.600, p < .005$), and 13-months ($t(21.696) = -3.731, p < .005$). Results comparing self-efficacy for those with moderation goals yielded no significant differences for those with moderate outcomes versus those with non-moderate outcomes at any assessment point; however, efficacy for goal achievement at the 13-month follow-up approached significance. Thus, there were no significant effects of self-efficacy by moderation group: at baseline ($t(37) = -.390, p > .05$), 4-months ($t(29) = -1.444, p > .05$), 7-months ($t(33) = -1.630, p > .05$), and 13-months ($t(35) = -1.857, p > .05$).

Hypothesis 5

In order to test the hypotheses regarding changes in goals, participants were grouped into one of two categories based on their goal change from one assessment point to subsequent assessment. Again, analyses were performed separately for abstinence and moderation goals for the reasons noted earlier. Regarding abstinence, the goal change group consisted of participants who changed from an abstinence goal to a moderation or non-moderation goal at the subsequent assessment point. The maintained abstinence goal group was comprised of participants who maintained an abstinence goal across the same assessment points. Regarding moderation, the goal change group consisted of participants who changed from moderation to non-moderation treatment goals at the subsequent assessment point and the maintained moderation goal group consisted of participants who maintained a moderation goal across the same assessment points. Once participants were grouped based on goal change for either abstinence or moderation goals from one

assessment to the next, t-tests were performed comparing participants who changed versus maintained their treatment goals on the measures of self-efficacy for goal attainment at the first assessment point and frequency of marijuana use during the 90 days preceding the next follow-up. Analyses included only participants in the two active treatment conditions who had either abstinence or moderation goals at a given assessment. Analyses were repeated for changes that occur between subsequent follow-ups to explore the robustness of the findings.

Table 6 presents means and standard deviations of self-efficacy at each assessment point and frequency of marijuana use during the 90 days preceding each follow-up. Although baseline self-efficacy for goal attainment was greater for participants in the maintained abstinence goal group the difference was not significant ($t(97) = 1.904, p > .05$). There were significant effects of self-efficacy by abstinence goal group at 4-months ($t(18.965) = 2.424, p < .05$), 7-months ($t(16.187) = 3.491, p < .005$), and for 13-months ($t(7.801) = 2.699, p < .05$). Participants in the maintained abstinence goal group reported significantly greater efficacy for goal achievement at each follow-up, but only approached significance at baseline.

Results from t-tests comparing frequency of marijuana use across abstinence goal groups indicated that at each follow-up participants in the maintained abstinence goal group reported using marijuana on significantly fewer days: at 4-months ($t(28.642) = -4.411, p < .001$); 7-months ($t(20.168) = -2.939, p < .01$), 13-months ($t(15.480) = -4.321, p < .005$), and 16-months ($t(7.560) = -2.746, p < .05$).

Results comparing self-efficacy for goal achievement across moderation goal groups yielded no significant differences at any assessment point. Thus, there were no significant effects of self-efficacy by moderation goal group: at baseline ($t(30) = .068, p > .05$), 4-months ($t(12.907) = 1.531, p > .05$), 7-months ($t(31) = .244, p > .05$), and 13-months ($t(25) = -.191, p > .05$). However, there were significant effects for frequency of marijuana use by moderation goal group. Participants in the maintained moderation goal group reported significantly less frequency of marijuana at 4-months ($t(30) = -6.482, p < .001$); 7-months ($t(27) = -4.399, p < .001$), 13-months ($t(31) = -3.028, p < .01$), and 16-months ($t(25) = -2.629, p < .05$).

To test whether self-efficacy and recent marijuana use interact to explain additional variance in the prediction of goal changes, regression analyses were performed

separately for abstinence and moderation goal change groups. Results of regression analyses for changes in abstinence and moderation goals are presented in Table 7. The dependent variable in the analyses for changes in abstinence goals was a dichotomous variable created to capture the presence or absence of changes in abstinence goals (i.e. abstinent – abstinent goal = 0; abstinent – moderation goal, abstinent – non-moderation goal = 1). The first predictor entered in the model was self-efficacy for achieving one's goal followed by frequency of marijuana use in the 90 days immediately preceding the follow-up, and then their interaction was entered as the third predictor in the model.

Results of the regression analysis revealed that at each assessment point the full models with self-efficacy for goal achievement, frequency of marijuana use in the 90 days prior to follow-up assessment, and their interaction were significant in predicting changes in abstinence goals: from baseline to 4-month follow-up ($F(3, 94) = 23.035; p < .001$), 4- to 7-month follow-up ($F(3, 75) = 5.727; p < .005$), 7- to 13-month follow-up ($F(3, 51) = 15.119; p < .001$), and from 13- to 16-month follow-up ($F(3, 41) = 12.353; p < .001$). Self-efficacy was a significant predictor of subsequent goal change at the 7-, 13-, and 16-month follow-ups. However, with an exception at the 7-month follow-up, it failed to add significant prediction beyond the effects of subsequent marijuana use, which consistently explained the most unique variance. The addition of the interaction terms did not provide significant independent contributions to any of the models.

Similar regression analyses were conducted to investigate changes in moderation goals. The dependent variable in these analyses was a dichotomous variable created to capture the presence or absence of changes in moderation goals (i.e. moderation – moderation goal = 0; moderation – non-moderation goal = 1). Predictors entered in the model at each follow-up were the same as in the analyses for changes in abstinence goals. At each assessment point, the full models with self-efficacy for goal achievement, frequency of marijuana use 90 days prior to follow-up assessment, and their interaction were significant in predicting changes in moderation goals: from baseline to the 4-month follow-up ($F(3, 28) = 13.636; p < .001$), from the 4- to 7-month follow-up ($F(3, 23) = 10.448; p < .001$), from the 7- to 13-month follow-up ($F(3, 29) = 3.988; p < .05$), and from the 13- to 16-month follow-up ($F(3, 23) = 3.932; p < .05$). Self-efficacy was not a significant predictor of subsequent goal change at any follow-up. Thus, it failed to add significant prediction beyond the effect of subsequent marijuana use, which consistently

explained the most unique variance. As in the analyses for changes in abstinence goals, the addition of the interaction terms did not provide significant independent contributions to any of the models.

Discussion

This study extended research on self-selected treatment goals to the field of marijuana dependence treatment. At initial assessment, the majority of individuals seeking treatment for marijuana dependence in this study chose an abstinence goal; however, there was a general trend toward non-abstinence goals across follow-up. In accordance with previous findings in the alcohol literature, participants who initially chose moderation goals were characterized as having less severity of physical dependence and problems related to marijuana use than those who chose abstinence goals. Additionally, goal choice was shown to influence treatment outcome such that participants were more likely to achieve outcomes consistent with their treatment goal. Participants with successful abstinent outcomes reported greater self-efficacy for goal achievement than those with unsuccessful abstinent outcomes. However, there were no significant differences on self-efficacy for participants with successful or unsuccessful moderate outcomes. Findings regarding changes in treatment goals suggest that for abstinence goals, but not moderation goals, greater self-efficacy for achieving one's goal was associated with maintaining that goal across follow-up. Lastly, participants who maintained either abstinence or moderation treatment goals reported less marijuana use during the preceding follow-up period.

Consistent with the hypothesis that individual characteristics predict initial treatment goal choice, participants with less physical dependence and severity of problems related to marijuana use were more likely to choose moderation than abstinence as their initial treatment goal. Multivariate results suggest that although severity of problems related to marijuana use and severity of physical dependence both relate to initial goal choice at the univariate level, the effect of physical dependence can be accounted for by the number of marijuana related problems. The explanation for the observed association between severity of problems, physical dependence, and initial goal choice is based on the notion that the greater an individual's physical dependence the less likely it is that the person will be able to moderate their use (Orford & Keddie, 1986). Given the apparent overlap with physical dependence, one can extend this logic to

individuals who have experienced more severe problems from their marijuana use. The findings regarding initial goal choice suggest that participants are often able to choose conceivably appropriate treatment goals based on their experience of physical dependence and problems related to marijuana use.

Other variables thought to discriminate those choosing abstinence or moderation goals: chronicity of marijuana use, previous treatment, and previous experiences with quitting did not predict initial goal choice. Regarding previous treatment, a possible source of discrepancy with previous findings from the alcohol literature may be due to the greater prevalence of AA-oriented treatment and alcohol treatment services in general available to persons with alcohol problems. Furthermore, chronic alcoholics may be more likely to seek services offered by these programs, whereas, chronic marijuana users may be more interested in treatment services tailored specifically to marijuana. However, the dearth of marijuana treatment services does not provide much treatment opportunities for these individuals. Lastly, the participants in the current study were screened for alcohol and drug abuse prior to entry and therefore, unlikely to attend treatment for substances other than marijuana.

The lack of differences in previous experiences quitting among those choosing abstinence or moderation goals may be due to an inability to distinguish attempts at quitting and reducing with the measure utilized in the study. Finally, it was surprising that chronicity of marijuana use did not discriminate individuals who chose abstinence from those who chose moderation treatment goals. The rationale for the proposed influence of chronicity of marijuana use is based on the notion that the longer an individual has used a substance, the more likely it is that the person would have experienced substance use problems and therefore, more likely to choose an abstinence goal. It may be that chronicity of marijuana use does not relate systematically to problems related to marijuana use and therefore does not influence one's decision regarding treatment goals.

Results indicate that goal choice influenced treatment outcome as hypothesized such that, at all follow-ups individuals with an abstinence goal were more likely to have abstinent outcomes than moderate outcomes and those with a moderation goal were more likely to have moderate outcomes rather than abstinent outcomes. These findings are consistent with reports in the alcohol literature indicating an association between treatment goal and subsequent achievement of that goal (Maisto et al., 1980; Booth et al., 1984; Elal-

Lawrence et al., 1986, 1987). Interestingly the results across follow-up also show that individuals with moderate goals were increasingly likely to have non-moderate outcomes compared to people with abstinent goals. This finding is corroborated by reports in the alcohol literature suggesting that individuals with abstinence goals have more favorable outcomes compared to those with moderation goals (Hodgins et al., 1997). The greater tendency for participants with moderation goals to slip into non-moderate use may be due to generally lower confidence in their ability to achieve the moderation goal they set relative to those with abstinence goals, resulting in a greater likelihood of using marijuana without putting limits on their use.

Analysis of whether the individual characteristics hypothesized to influence initial treatment goal choice reliably predict outcome yielded no significant effects for any of the predictor variables at any of the follow-ups, except for the 16-month follow-up. Specifically, participants with moderate outcomes at the 16-month follow-up reported significant fewer physical dependence symptoms at baseline compared to those with non-moderate outcomes. Given the observed association between goal choice and treatment outcome, it is surprising that variables shown to be associated with goal choice (i.e. physical dependence and severity of problems) were not better predictors of treatment outcome. Although physical dependence and severity of problems are associated with goal choice, there may be additional factors in conjunction with one's goal that influence treatment outcome.

Regarding the influence of self-efficacy on treatment outcome results indicated that at each assessment point, participants with successful abstinent outcomes reported greater self-efficacy for goal achievement than those with unsuccessful abstinent outcomes. In contrast, there were no significant differences on self-efficacy for goal achievement at any assessment point between participants with successful moderate outcomes and unsuccessful moderate outcomes. However, power to detect differences was reduced due to smaller number of participants with moderation goals. Differences in mean self-efficacy between successful and unsuccessful moderate outcomes were in the hypothesized direction and generally of medium effect sizes with the exception of baseline. Closer examination of the data reveals relatively small effect sizes for self-efficacy on moderate outcomes across assessments ($d = .13 - .61$) compared to those for self-efficacy on abstinent outcomes ($d = .57 - 1.3$). Consistent with the notion that post-

treatment self-efficacy judgments should be better informed and thus more influential on subsequent treatment outcome compared to pre-treatment efficacy, there were increases in the effect size for efficacy on abstinent and moderate outcomes from baseline to the 4-month follow-up (.57 to $> .86$ and .13 to $> .53$ for abstinent and moderate outcomes, respectively). Thus, it appears that self-efficacy for goal achievement is more strongly related to outcomes for those with abstinence treatment goals, but appears to exert some effect across both goal types. It may be that the level of self-efficacy required to successfully achieve an abstinence goal is greater than that which is required to successfully achieve a moderation goal. This is based on the observation that participants in the successful abstinent group reported significantly greater self-efficacy than all other groups, whereas, participants in the successful moderate group reported similar levels of efficacy as those in the unsuccessful abstinent group.

The findings regarding changes in treatment goals suggest that for abstinence goals, but not moderation goals, greater self-efficacy for one's goal is associated with maintaining that goal across follow-up. Frequency of marijuana use during the 90 days preceding follow-up was associated with changes in both abstinence and moderation goals across follow-up such that participants who maintained their treatment goals reported less marijuana use. Tests of a possible interaction between self-efficacy for one's goal and recent marijuana use were not significant for either abstinence or moderation goals. Regression analyses indicated that of the variables in the model, frequency of marijuana use accounts for most, if not all, of the variance in predicting changes in abstinence or moderation goals. Findings regarding the influence of recent marijuana use on goal change suggest that many participants modified their treatment goal in response to failed attempts at achieving their goal, regardless of their level of efficacy for achieving the goal.

Again, self-efficacy appears to operate differentially for abstinence and moderation treatment goals. It may be that assessing one's ability for moderation is more diffuse than for abstinence goals and therefore not as related to either outcomes or future goal changes. Specifically, self-regulation around moderation goals may be more difficult because departure from an abstinence goal is clearly recognizable, whereas, the delineation of what constitutes a departure from a moderation goal is less clear. Although participants who maintained abstinence goals reported greater self-efficacy for

goal achievement, the pattern of findings in the hierarchical regression suggests that self-efficacy exerts its influence on future goals through its relationship with future frequency of use. Generally, once frequency of use is controlled, the effect of self-efficacy disappears.

As mentioned earlier participants were more likely to choose abstinence than moderation as their initial treatment goal. Interestingly, there was a decrease in the proportion of participants choosing abstinence goals starting at the 4-month follow-up and continued with a general trend toward non-moderation treatment goals across time. As noted earlier, participants in the moderation goal group had not explicitly stated that moderation was their treatment goal, but had indicated non-abstinence goals and were retrospectively categorized as moderate given that they planned to use marijuana on no more than 3 days per week. Similarly, participants who indicated having non-abstinence goals, but specified a level of marijuana use exceeding the cut-off for moderation goals, were categorized in the non-moderation goal group. In the alcohol literature, some authors have cautioned against viewing individuals who choose moderation goals as part of a homogeneous group (e.g., Adamson & Sellman, 2001). They suggest that there may be individuals who work toward moderate drinking while others set goals for drinking at reduced amounts, which may continue to be viewed as harmful. The present data indicate that the majority of participants choosing a non-abstinence goal at baseline defined their goal consistent with the cut-off for moderation in this study. Consistent with Adamson and Sellman (2001), the observed increase in non-moderation goals over time may be representative of a subgroup of individuals who aim to reduce their marijuana use but at a level that may continue to be harmful. Alternatively, these individuals may have abandoned their treatment goals altogether, thus were not working toward changing their marijuana use.

In terms of the validity of moderation goals, one should consider that participants in this study entered an abstinence oriented treatment program, yet were given the opportunity to specify their own treatment goals. Upon entering the program many participants may have held personal intentions to limit their marijuana use, but lacked a clear notion of the specifics associated with moderating one's use (e.g. number of days planned to use per week). The result may have been a relatively uniformed moderation goal. Further, neither of the active treatments directly supported moderation goals and

results may have differed if treatments had been geared toward careful specification and monitoring of progress toward moderate outcomes. Therefore, these data can only be considered as illustrative of what happens with moderate goals in abstinence-oriented treatment. Given the prevalence of abstinence as the goal of choice in most treatment programs today, the results are still relevant.

Lastly, there remains uncertainty concerning the best approach for defining moderate marijuana use. In the current study, the definition of moderation was based on participant data suggesting that use on 3 days or less was considered by most participants to constitute a moderation goal. Furthermore, previous findings have identified marijuana users who continued to use about 3 days or less, yet did not report increases in dependence or problems related to their use. Overall, the data suggests that the definition of moderation in the current study has face validity and represented a significant change from the daily multiple uses that characterized most of the sample at baseline. Although we utilized a working definition of moderate marijuana use in the current study, the issue of defining moderate marijuana use warrants further inquiry. Other approaches to defining moderation may involve a consideration of the number of times an individual uses marijuana per day, time of day that an individual uses, or some combination. It would be worthwhile to incorporate various conceptualizations of moderation goals given the multiple ways in which one may choose to define moderate use. Lastly, it would be useful to examine changes in dependence symptoms and problems related to marijuana use in relation to moderation goals.

Although the current study was novel in that it consisted of multiple follow-ups over a 1-year period from which assessment of participants' treatment goals and changes in goals were obtained, there are a number of limitations of the research design that need to be acknowledged. Most important, this study is based on secondary analyses of a previously published treatment outcomes study. Thus, the overall study design was not centered on investigating marijuana treatment goals; this is evident in the restricted nature in some of the measures used. The GS measure used to assess treatment goals and self-efficacy for achieving one's goal was limited in that it had only one item assessing efficacy. Nevertheless, the GS did require participants to specify moderation goals in terms of number of days planned to use marijuana in a given week and provided assessment of self-efficacy specific to one's treatment goal. Lastly, the generalizability of

the present findings may be limited to treatment-seeking marijuana users with similar sociodemographic characteristics.

This study was a first step in gaining an understanding of the determinants of treatment goal choice and treatment outcomes for marijuana use based on treatment goals. It is noteworthy that this is the first study to investigate treatment goals and outcomes for illicit drug use. Furthermore, this is the first study to focus on the influence of self-efficacy and goal achievement on changes in treatment goals. The lack of attention to the influence of treatment goals on marijuana treatment outcomes is disconcerting given recent data on the prevalence of marijuana dependence and the potential health concerns. Future studies should tailor the research design to more thoroughly investigate the effects of treatment goals on outcome and the nature of changes in treatment goals across time. Obtaining information directly from participants regarding their reasons for choosing a particular treatment goal and the circumstances leading to changes in their goals would assist in providing a better understanding of these processes.

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Table 1. Percentages of Abstinence, Moderation, and Non-moderation Treatment Goals, Days Planned to Use Marijuana, and Times per Day Planned to Use Marijuana

	Baseline n=285	4-month n=147	7-month n=134	13-month n=136	16-month n=141
Abstinence Goal	71.2	60.5	55.2	45.6	48.9
Moderation Goal	27.7	27.9	26.1	27.9	25.5
Non-moderation Goal	1.1	11.6	18.7	26.5	25.5
Days planned to use marijuana per week					
0	25.6	4.3	1.7	2.7	-
1	37.8	19.4	26.7	18.9	20.8
2	29.3	26.9	20.0	14.9	13.9
3	3.7	21.5	10.0	14.9	15.3
Total	96.4	72.1	58.4	51.4	50.0
4	-	7.5	15.0	10.8	11.1
5	1.2	7.5	8.3	10.8	9.7
6	-	1.1	1.7	-	1.4
7	2.4	11.8	16.7	27.0	27.8
Total	3.6	27.9	41.7	48.6	50.0
Times/day planned to use marijuana (0-3 days per week)					
0	15.2	3.1	-	-	-
1	49.4	41.5	45.7	54.1	41.7
2	24.1	38.5	31.4	24.3	27.8
3	6.3	12.3	22.9	18.9	30.6
4 or more	5.1	4.6	-	2.7	-
Times/day planned to use marijuana (4-7 days per week)					
1	66.7	30.8	25.0	30.6	22.2
2	33.3	34.6	25.0	27.8	36.1
3	-	23.1	25.0	27.8	22.2
4 or more	-	11.4	25.0	14.0	19.5

Note. The 4-, 7-, 13-, and 16-month follow-up samples are based on participants randomly assigned to the two active treatments (n = 205) who completed the follow-up assessment.

Table 2. Predictor variables for goal choice at baseline

	<u>ABS</u> n=203		<u>MOD</u> n=79		t
	M	SD	M	SD	
Marijuana dependence	5.45	1.47	4.94	1.76	2.49*
Marijuana problems	14.79	5.87	12.00	4.69	3.78**
Age of first MJ use	15.97	4.07	15.65	3.47	.607
Years of MJ use	17.53	5.31	16.69	5.02	1.198
Age of first daily MJ use	19.38	5.44	19.70	4.47	-.435
Number of times attended AA-oriented treatment	4.23	31.00	4.38	25.81	-.039
Number of times attended treatment for MJ use	1.69	8.49	0.44	1.77	1.30
Number of times attended substance abuse treatment	5.55	32.61	5.00	25.94	.135
Number of previous quit attempts	4.78	26.12	2.18	5.16	.878
Quit time in weeks	6.68	20.35	4.39	6.78	.773

ABS = Abstinent drinking goal at baseline; MOD = Moderate drinking goal at baseline.

For Quit time in weeks variable: n=165 (ABS), n=49(MOD)

*p < .05.

**p < .01.

Table 3. Results of logistic regression on predictors of initial treatment goal choice

Predictors	B	OR	95% C.I. for OR	
			Lower	Upper
Marijuana dependence	-.090	.914	.665	1.256
Marijuana problems	-.494	.610***	.426	.873
Age of first MJ use	-.373	.689	.439	1.081
Years of MJ use	-.211	.810	.613	1.070
Age of first daily MJ use	.346	1.413	.905	2.208
Number of times attended substance abuse treatment	.076	1.079	.823	1.414
Number of previous quit attempts	-.471	.624	.131	2.972

Note. Dependent variable was initial goal choice (abstinence = 0; moderation = 1)

OR = odds ratio

***p < .001.

Table 4. Percent agreement between goal choice and treatment outcome across all assessment points

Outcome at next follow-up	Assessment point							
	Baseline		4-month		7-month		13-month	
	Goal Abstinence n=117	Goal Moderation n=46	Goal Abstinence n=81	Goal Moderation n=39	Goal Abstinence n=70	Goal Moderation n=35	Goal Abstinence n=60	Goal Moderation n=38
Abstinent	47.0	15.2	53.1	15.4	54.3	0.0	66.7	2.6
Moderate	32.5	54.3	35.8	41.0	22.9	51.4	18.3	55.3
Non-moderate	20.5	30.4	11.1	43.6	22.9	48.6	15.0	42.1

Note. Percentages refer to the proportion of participants with abstinence goals and those with moderation goals having abstinent, moderate, or non-moderate outcomes.

Table 5. Means and standard deviations of self-efficacy for goal achievement in relation to treatment outcomes at the next assessment

Outcome Groups	Baseline			4-month			7-month			13-month		
	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD
Self-Efficacy for Goal Achievement												
<u>Abstinence Goal</u>												
Abstinent Outcome	55	81.42 ^a	20.82	43	93.05 ^a	14.13	30	93.30 ^a	11.24	29	95.97 ^a	10.34
Non-abstinent Outcome	62	69.10 ^b	22.25	38	75.42 ^b	26.86	31	78.39 ^b	20.04	19	72.37 ^b	26.27
<u>Moderation Goal</u>												
Moderate Outcome	25	75.96 ^a	17.20	15	75.00 ^a	20.35	18	76.11 ^a	18.52	21	71.86 ^a	20.94
Non-moderate Outcome	14	73.57 ^a	20.23	16	61.88 ^a	29.15	17	64.24 ^a	24.34	16	56.13 ^a	30.61

Note. Goals were assessed concurrent with self-efficacy judgments whereas outcomes were assessed at the next assessment point. Means in the same column with different superscripts, separately for abstinence and moderation goals, differ significantly, $p < .005$.

Table 6. Means and standard deviations of self-efficacy for goal achievement and frequency of marijuana use in relation to goal change

Goal Change Groups	Goal Change Period											
	<u>Baseline to 4-months</u>			<u>4-months to 7-months</u>			<u>7-months to 13-months</u>			<u>13-month to 16-months</u>		
	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD
Self-Efficacy for Goal Achievement												
<u>Abstinence Goal</u>												
Maintained Goal	75	79.15 ^a	20.17	62	89.47 ^a	17.88	42	90.90 ^a	14.22	37	91.97 ^a	15.62
Changed Goal	24	70.29 ^a	18.72	17	70.29 ^b	31.24	13	70.62 ^b	19.41	8	61.88 ^b	30.70
<u>Moderation Goal</u>												
Maintained Goal	23	72.61 ^a	16.98	16	80.94 ^a	15.19	20	71.75 ^a	22.73	23	69.48 ^a	26.93
Changed Goal	9	72.11 ^a	22.22	11	64.55 ^a	33.20	13	69.77 ^a	22.86	4	72.25 ^a	26.08
Frequency of Marijuana Use for Past 90 Days												
<u>Abstinence Goal</u>												
Maintained Goal	74	7.27 ^a	20.13	62	6.81 ^a	19.40	49	6.94 ^a	19.62	49	6.71 ^a	18.56
Changed Goal	24	39.00 ^b	33.32	17	28.53 ^b	28.73	14	48.57 ^b	34.49	8	44.13 ^b	37.79
<u>Moderation Goal</u>												
Maintained Goal	23	17.48 ^a	22.06	17	25.12 ^a	26.10	20	30.35 ^a	26.67	23	29.83 ^a	23.43
Changed Goal	9	73.56 ^b	21.84	12	66.25 ^b	22.78	13	58.23 ^b	24.49	4	62.50 ^b	18.93

Note. Self-efficacy was assessed concurrently with initial goal at the first assessment point in each goal change period. Frequency of use was assessed retrospectively at the subsequent assessment for the preceding 90 days and corresponds to marijuana use preceding the goal assessment at the second time-point in each goal change period.

Means in the same column with different superscripts, separately for abstinence and moderation goals, differ significantly, $p < .05$.

Table 7. Results from regression analysis on self-efficacy for goal attainment and frequency of marijuana use in relation to treatment goal change

Step and Predictor	4-month		7-month		13-month		16-month	
Change in abstinence treatment goals								
	n=98		n=79		n=55		n=45	
	β	ΔR^2	β	ΔR^2	β	ΔR^2	β	ΔR^2
Step 1								
1. Goal self-efficacy	-.173	.030	-.370**	.137**	-.374**	.140**	-.500***	.250***
Step 2								
1. Goal self-efficacy	-.087		-.263*		-.201		-.207	
2. Frequency of use	.626***	.384***	.247*	.049*	.597***	.327***	.550***	.216***
Step 3								
1. Goal self-efficacy	-.136		-.274		-.254		-.116	
2. Frequency of use	.238		.218		.318		.822*	
3. Goal SE x Freq. use	.397	.010	.029	.000	.277	.004	-.254	.008
Full model R^2		.424		.186		.471		.475
Full model adjusted R^2		.405		.154		.440		.436
Change in moderation treatment goals								
	n=32		n=27		n=33		n=27	
	β	ΔR^2	β	ΔR^2	β	ΔR^2	β	ΔR^2
Step 1								
1. Goal self-efficacy	-.012	.000	-.328	.108	-.044	.002	.038	.001
Step 2								
1. Goal self-efficacy	.050		-.019		.185		.367	
2. Frequency of use	.768***	.586***	.751***	.468***	.554**	.255**	.651**	.316**
Step 3								
1. Goal self-efficacy	.133		.031		-.145		.106	
2. Frequency of use	1.112*		.827		-.007		.292	
3. Goal SE x Freq. use	-.359	.008	-.076	.000	.553	.036	.353	.022
Full model R^2		.594		.577		.292		.339
Full model adjusted R^2		.550		.522		.219		.253

Note. At each follow-up: goal self-efficacy was assessed at the previous assessment and frequency of marijuana use was assessed for the 90 days immediately preceding follow-up
 * $p < .05$. ** $p < .01$. *** $p < .001$

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.
- _____ 8:00 am 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
Influence

Moderate
Influence

Very Strong
Influence

Appendix C

Marijuana Dependence

Please read each of the following statements and circle YES if it describes your use of **marijuana** during the past 90 days. Circle NO if the statement does not apply to you.

	During the Past <u>90 Days</u>
1. When I used marijuana, I often ended up smoking more or for a longer period of time than I intended.	YES NO
2. I frequently thought about or actually tried unsuccessfully to cut down or control my use of marijuana.	YES NO
3. I spent a great deal of time either trying to get marijuana, smoking it, or recovering from its effects.	YES NO
4. I was frequently high or recovering from being high when I was supposed to be attending to my obligations at work, school or home.	YES NO
5. I was frequently high or recovering from being high when I was doing something hazardous like driving a car.	YES NO
6. I sometimes gave up or did not participate in important occupational, social, or recreational activities because I was using marijuana.	YES NO
7. I continued using marijuana despite knowing that it was contributing to social, psychological, or physical problems in my life.	YES NO
8. I needed to smoke more marijuana than I smoked in the past to get the same effects.	YES NO
9. I noticed that I was not getting as “high” as I used to when I smoked the same amount of marijuana.	YES NO
10. I experienced withdrawal symptoms when I tried to stop using marijuana (for example, difficulty sleeping, irritability, excessive perspiration).	YES NO
11. I often used marijuana to relieve or avoid experiencing marijuana-related withdrawal symptoms.	YES NO

Appendix D

Marijuana Problems

The following items are different types of problems you may have experienced as a result of using **marijuana**. Please circle the number on the scale in the first column that indicates whether you have **ever** experienced this problem.

Then circle the number on the scale in the second column that indicates whether this has been a problem **in the past 90 days**.

0 = no problem

1 = minor problem

2 = serious problem

Has marijuana use caused:	Ever	Past 90 days
1. Problems between you and your partner	0 1 2	0 1 2
2. Problems in your family	0 1 2	0 1 2
3. You to neglect your family	0 1 2	0 1 2
4. Problems between you and your friends	0 1 2	0 1 2
5. You to miss days at work or miss classes	0 1 2	0 1 2
6. You to lose a job	0 1 2	0 1 2
7. You to have lower productivity	0 1 2	0 1 2
8. Medical problems	0 1 2	0 1 2
9. Withdrawal symptoms	0 1 2	0 1 2
10. Blackouts or flashbacks	0 1 2	0 1 2
11. Memory loss	0 1 2	0 1 2
12. Difficulty sleeping	0 1 2	0 1 2
13. Financial difficulties	0 1 2	0 1 2
14. Legal problems	0 1 2	0 1 2
15. You to have a lower energy level	0 1 2	0 1 2
16. You to feel bad about your use	0 1 2	0 1 2
17. Lowered self-esteem	0 1 2	0 1 2
18. You to procrastinate	0 1 2	0 1 2
19. You to lack self-confidence	0 1 2	0 1 2

Appendix E

Previous Treatment

In the table below and on the following page you will be asked to indicate the number of times you participated in different types of counseling during the last 12 months. Please do not list your participation in one type of counseling under more than one category. For instance, if you saw a private counselor 5 time in the last 12 months and discussed both drug use and other personal issues, place a 5 by either “outpatient counseling for drug use” or “outpatient counseling for psychological or emotional issues”, **but do not place a 5 by both of these categories.**

*Choose the **one** category that best captures the purpose of the counseling you received. If you attended more than one type of counseling (e.g. 5 sessions of outpatient psychological counseling and 10 AA meetings) those should be listed separately.

In the first column, please indicate the NUMBER OF TIMES you received help for drug, alcohol, or psychological issues during the past 12-months (e.g. the number of sessions you have attended in the past 12 months.) If none, enter a “0”. In the second column, please indicate whether you are currently receiving or attending each type of help.

	Number of times in past 12 months	Are you currently attending	
1. Attended Marijuana Anonymous (MA) Meetings	_____	Yes	No
2. Attended Alcoholics Anonymous (AA) Meetings	_____	Yes	No
3. Attended Narcotics Anonymous (NA) Meetings	_____	Yes	No
4. Attended Cocaine Anonymous (CA) Meetings	_____	Yes	No
5. Attended other self-help or support group meetings for drug or alcohol use. (Please specify group: _____)	_____	Yes	No
6. Received outpatient counseling for marijuana use (e.g. office visits to a private counselor, community treatment agency, etc.).	_____	Yes	No
7. Received outpatient counseling for alcohol use.	_____	Yes	No
8. Received outpatient counseling for other drug use.	_____	Yes	No
9. Participated in an inpatient program for marijuana use (e.g. a hospital, Care Unit, Schick, etc.). Enter the number of days in treatment.	_____	Yes	No
10. Participated in an inpatient program for alcohol use. Enter number of days in treatment.	_____	Yes	No
11. Participated in an inpatient program for other drug use. Enter the number of days in treatment.	_____	Yes	No

12. Received any other type of help or treatment for marijuana, alcohol, or drug use.
(Please specify: _____) _____ Yes No
13. Attended a self-help or support group for psychological or emotional problems _____ Yes No
14. Received outpatient counseling for psychological or emotional problems. _____ Yes No
15. Received inpatient counseling for psychological or emotional problems. Enter number of days in treatment. _____ Yes No
16. Received any other type of help or treatment for psychological or emotional problems.
(Please specify: _____) _____ Yes No

17. How long have you been considering quitting marijuana use?

- | | | | |
|---|----------------------|---------------------------|------------------------------|
| 1 | 2 | 3 | 4 |
| Only after
I heard of the
Program | For the
past year | For two to
three years | For more than
three years |

18. How many times have you seriously attempted to quit or greatly cut back marijuana use in the past 12 months? By serious we mean an attempt to quit or cut back that involved either telling others you were quitting or cutting down, getting rid of your marijuana supply or in some other way taking action to reduce your use. Please estimate the NUMBER of attempts that met this definition. If you have not attempted to quit in the past 12 months enter 0 in the blank.

_____ times

19. In all of your attempts to quit or cut back in the past 12 months, what was the longest single period of time you were successful? Do not include periods in which your smoking was limited because you could not obtain marijuana. Please indicate the NUMBER of weeks or months that you were successful. Enter 0 in the blank if you were not successful for at least a week.

_____ not applicable (I didn't try to quit)

_____ weeks

_____ months

Appendix F

Treatment Goals

As you know, the goal of this program is to help you achieve abstinence from marijuana. For research purposes, we want to know your personal goals, even if they are not consistent with the treatment goals.

Instructions: On this form describe you goal regarding abstinence or your use of marijuana at the end of the treatment program. Do you intend to not use marijuana at all, or to use it only in certain ways and under certain conditions? What is your goal now? If your goal mentions smoking marijuana, describe what you mean in terms of amount of marijuana and circumstances under which you would use marijuana and the circumstances under which you will definitely not use marijuana.

YOUR RESPONSES WILL NOT AFFECT YOUR ELIGIBILITY FOR THE STUDY.

A. At the end of this treatment program, my goal is:

1. _____ TO NOT USE MARIJUANA AT ALL (Skip to part B, next page)
2. _____ TO USE MARIJUANA ONLY IN CERTAIN WAYS
 - a. Over the course of an average week (7 days), I plan to use marijuana on no more than _____ days.
 - b. On the average day when I use marijuana, I will probably use it about _____ times during the course of that day.
 - c. Indicate on how many successive days you will use marijuana before a period of at least one day of abstinence.

I plan to use marijuana no more than _____ days in a row.

B. In the designated space below, indicated how confident you feel at this moment that you will achieve your stated goal by the end of the treatment program. In other words, what is the probability that you will achieve your goal. Use the following scale as a guide.

0%.....	50%.....	100%
Not	50/50 chance	Totally
At all	I will achieve	confident
confident	my goal	I will achieve
I will achieve		my goal
My goal		

Write your confidence rating (from 0% to 100%) here: _____

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- 2001 – present** Virginia Polytechnic Institute and State University,
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Degree expected: Doctor of Philosophy
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- 2001 – 2004** Virginia Polytechnic Institute and State University,
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CLINICAL POSITIONS

- 5/03-12/04** Substance Abuse Rehabilitation Treatment Program for inpatients,
Salem Veteran’s Affairs Medical Center, Salem, VA. Extern.
Duties: Conduct therapy, conduct assessments, attend weekly
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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.
 - Conducted various assessments, including screening for program admission, intake for general symptomatology, neuropsychological, cognitive, and symptom-focused (Obsessive-Compulsive Disorder, Mood disorders, 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: General process group therapy at Cook Counseling Center.

Supervisors: Richard Eisler, Ph.D.
Alicia Townsend, M.A.
Bob Miller, Ph.D.

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.

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, managed and coordinated data entry and data cleaning procedures. Conducted weekly standardized interview assessments with VA participants. 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.

6/99 - 8/01

Life Course and Health Research Center, Florida International University, Miami, FL. Program Assistant. Duties:

- Located, contacted, and scheduled interviews with participants
- Conducted interviews with participants
- Coded and entered data
- Trained new interviewers in appropriate procedures
- Assisted in editing questionnaire and creating forms for future study
- Performed literature searches on topics related to research study.

Supervisor: R. Jay Turner, Ph.D.

1/98 - 5/99

Department of Psychology, University of Miami, Coral Gables, FL. Undergraduate Research Assistant. Duties:

- Assisted in outpatient recruitment
- Assisted in transcribing, coding, entering, rating, and analyzing data
- Researched topics on bipolar disorder in preparation for honors thesis
- Completed senior honors thesis and submitted article for publication
- Presented paper at conferences

Supervisor: Sheri L. Johnson, Ph.D.

AWARDS & HONORS

- Graduate Dean's Fellowship
- Jay F Pearson Scholarship,
- National Dean's List,
- Honors Program,
- Provost's Honor Roll,
- Golden Key National Honor Society,

- President's Honor Roll,
- Phi Kappa Phi National Honor Society,
- General Honors,
- Departmental Honors in Psychology.

PRESENTATIONS

Lash, S. J., Stephens, R. S., Burden, J., Grambow, S., Horner, R., Walker, N. R., DeMarce, J., Jones, M., Lozano, B. (2002, November). *Contracting, Prompting, and Reinforcing Substance Abuse Aftercare Attendance: 3-month Outcomes of a VA HSR&D Funded Clinical Trial*. Poster presentation at the Association for the Advancement of Behavioral Therapy, Reno, Nevada.

Walker, N. R., DeMarce, J., Jones, M., Lozano, B., Stephens, R. S., Lash, S. J., Burden, J. (2002, November). *Development of an Aftercare Self-Efficacy Questionnaire: Validity and Ability to Predict Aftercare Attendance*. Poster presentation at the Association for the Advancement of Behavioral Therapy, Reno, Nevada.

Lozano, B.E., & Johnson, S.L. (1999, November). *Personality traits as predictors of mania and depression*. Poster presentation at the Association for the Advancement of Behavioral Therapy, Toronto, Canada.

Lozano, B.E., & Johnson, S.L. (1999, April). *The influence of personality traits on the course of bipolar disorder*. Paper presented at the 1999 Carolinas Psychology Conference, Raleigh, NC.

Lozano, B.E., & Johnson, S.L. (1998, October). *The influence of personality traits on the course of bipolar disorder*. Poster presentation at the Second Annual University of Miami Undergraduate Research Day, Coral Gables, FL.

PUBLICATIONS

Lozano, B.E., & Johnson, S.L. (2001). Can personality traits predict increases in manic and depressive symptoms? *Journal of Affective Disorders* 63, 103-111.