

THESIS

DEVELOPMENT AND EVALUATION OF A BRIEF TREATMENT FOR CANNABIS-  
RELATED PROBLEMS

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## ABSTRACT

### DEVELOPMENT AND EVALUATION OF A BRIEF TREATMENT FOR CANNABIS-RELATED PROBLEMS

Cannabis use and related problems have shown a consistent increase among young adults in recent years despite abstinence being the predominant goal for most treatments. Research indicates that many individuals with problematic cannabis use do not seek treatment due to a desire to continue using. Whereas abstinence assumes any use to be problematic, harm reduction offers a comparably effective alternative that is conducive to reductions in use or problems as the primary goal of treatment. However, research exploring harm reduction as a standalone treatment for cannabis is underdeveloped. Another challenge facing cannabis treatment is the wide variability in training procedures and evaluation of therapist adherence to intervention protocol reported in the relatively few cannabis-specific treatment studies conducted to date. The current study addressed these disparate treatment concerns through the development of a harm reduction treatment for cannabis, establishment of a standardized approach for therapist training and evaluation, and testing the feasibility of this intervention against a healthy stress management (HSM) control condition. **Methods.** Prior treatment studies were used to inform the selection of intervention components for the cannabis-specific treatment (CST). The HSM condition was adapted from a web-based version where it also served as a control condition. Study therapists were trained on the CST and HSM protocols using manual review, didactic training, and role plays. Adherence to treatment protocols was assessed using fidelity checklists developed for use with each unique study condition. The analytical sample ( $n = 16$ ) consisted of community

members interested in treatment and undergraduate students participating for research credit. A 2x2 ANCOVA tested for intervention effects on cannabis-related problems while controlling for sex. Descriptive statistics and clinical significance were used to assess therapist training and fidelity, as well as selected participant outcomes. **Results.** Therapist training showed high rates of attrition, with fewer than half of therapists completing all stages. Among therapists who completed all stages of training, fidelity checks indicated high protocol adherence rates across study conditions. Although no treatment effect for reduction of cannabis-related problems was detected, several participants reported clinically significant increases or decreases on measures of distress, dependence, use frequency, and goal attainment. **Discussion.** Findings suggest that use of a standardized, multimethod training paradigm facilitates high rates of therapist adherence to manualized treatment protocol. The potential for the present study to be used as a template for development of a therapist training model in future work is discussed. Though preliminary analyses did not support the CST as efficacious for cannabis-related problem reduction, there was a trend toward higher goal attainment for participants who received the CST. Goal type endorsement also aligned with prior findings that alternatives to abstinence-based programming for cannabis are needed.

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## INTRODUCTION

Young adults (i.e., 19-30 years old) are shown to have consistently higher rates of both daily and past 30-day cannabis use compared to all other age groups (Schulenberg et al., 2017). Additionally, research has shown that individuals who report frequent and/or heavy use patterns are more likely to have higher endorsement of cannabis-related problems (Dvorak & Day, 2014). Most currently available treatments prioritize abstinence from cannabis use as the goal of treatment (Gates, Sabioni, Copeland, Le Foll, & Gowing, 2016). However, relatively little research has focused on reducing cannabis-related problems as a primary outcome.

The notion of reducing cannabis-related problems as the primary focus of treatment stems from the harm reduction literature for alcohol. Early studies which employed harm reduction focused on controlling drinking and decreasing negative consequences instead of abstinence (Sobell & Sobell, 1973; Heather & Robertson, 1983). Although this approach still allows for abstinence as a goal, it assumes the perspective of the treatment seeker, and therefore does not assume abstinence will be desired or attained by the client (Marlatt, 1996). Interventions based on harm reduction have been demonstrated to be equally effective as abstinence approaches in reducing alcohol related consequences (Marlatt & Witkiewitz, 2002), however similar application of this approach for cannabis is less developed.

### **Intervention Literature**

Motivational Interviewing (MI) was developed as a form of substance use treatment which helps clients to identify the positive and negative aspects of their substance use which led them to treatment (Miller, 1983). Since its inception, MI has undergone several changes and

expansions to be more encompassing of the personal change process. Current applications of MI rely on four processes: engaging, focusing, evoking, and planning (Miller & Rollnick, 2013).

According to Miller and Rollnick (2013), engaging is a necessary first step in the process of change, and includes clinical skills such as listening, core interviewing skills (e.g., open-questions, reflections, etc.), and exploration of values and goals. The combination of these skills serves to establish a strong therapeutic relationship, which has been consistently reported as vital to success in therapy regardless of treatment modality (Duncan, Miller, Wampold, & Hubble, 2010). Part of the approach to this which is unique to MI is through the specific use of Open-ended questions, Affirmations, Reflections, and Summaries (Miller & Rollnick, 2002). Commonly referred to as OARS, these skills represent the client-centered spirit of MI and are used throughout the course of therapy (Miller & Rollnick, 2002). The use of these skills leads into the second process of MI, which is focusing.

The purpose of focusing within MI is to establish an ongoing, strategic direction in which the therapist and client can pursue to refine treatment goals (Miller & Rollnick, 2013). This direction can be provided from three sources: the client, the setting, and through clinical expertise (Miller & Rollnick, 2013). Most commonly, clients seek treatment for a specific problem, however the setting may provide direction based on the services offered (Miller & Rollnick, 2013). For example, clients may seek help in reducing their cannabis use, representing a client-driven focus, whereas the provider may specialize in substance-related problems, indicating a setting-driven focus.

Lastly, clinical expertise is seen when the treatment provider identifies goals the client has not identified (Miller & Rollnick, 2013). This is illustrated when the treatment provider uncovers additional changes necessary for their client to meet their identified goal. Miller and



Rollnick (2002) specify that the goal of this is not for the treatment provider to problem-solve, or attempt to “fix” the client, which is a common tendency they describe as the expert trap. Instead, the spirit of MI maintains the client is the expert on their own life, making them the most qualified to determine how change can be introduced (Miller & Rollnick, 2002). Though the goals of the client may differ from those of the setting and/or clinician, collaboration has been consistently identified as a vital element within the MI literature (Miller & Rollnick, 2002, 2013; Moyers, Miller, & Hendrickson, 2005). It follows that the process of focusing involves leading and following on the part of the clinician, allowing the client to elucidate their own reasons for change.

This leads to the third process in MI, known as evoking. According to Miller and Rollnick (2013), this process is intended to elicit change talk from the client by evoking the client’s motivation for change. This is accomplished by exploring and resolving ambivalence within the client about changing the target behavior, which allows them to examine the perceived positive and negative aspects of change (Miller & Rollnick, 2002). Ambivalence is most commonly recognized through the presence of both change talk (statements in favor of change) and sustain talk (statements in favor of the status quo) (Miller & Rollnick, 2013).

Contrary to previous editions detailing MI theory, the current version places added emphasis on the role of the treatment provider when discord arises in the therapeutic relationship (Miller & Rollnick, 2013). This departure from prior theory, which described sustain talk as “resistance” (Miller & Rollnick, 2002), is more in line with the spirit of MI. That is, a collaborative, strong therapeutic alliance which discourages labelling of clients (e.g., “resistant”) is established as the foremost priority of the treatment provider. In doing so, change talk can be

more effectively supported, and sustain talk is regarded as naturally occurring in the change process.

Once the desire for change has been fostered, the client moves to planning as the final process in MI. As stated by Miller and Rollnick (2013), planning is the necessary progression from collaborating about change to implementing it through commitment to a specific plan. Notably, three key features identified by the theory are collaboration, commitment, and specificity in developing the plan. These three concepts underscore the fundamental processes outlined. Moreover, in a large analysis of individual MI sessions, Moyers and colleagues (2005) found that clinicians who adhered closely to the processes and spirit of MI had superior outcomes compared to others who were rated as having lower treatment fidelity. Their findings suggest that MI provides clinicians with a resource for client engagement that assists them in navigating complex interpersonal relationships throughout the change process.

Although effective at eliciting motivation for change, MI is not a structured technique best delivered in a manualized fashion (Miller & Rollnick, 2009). In response to this, Motivational Enhancement Therapy (MET) was developed for treatment of substance abuse (Miller, 1995). As noted by Drapkin et al. (2016) MET utilizes a combination of personalized assessment feedback and MI to inspire change behaviors in clients. A key distinction between MET and MI is the inclusion of assessment feedback in MET, which is not required for MI (Miller & Rollnick, 2009). MET uses assessment feedback, planning and goal setting, and reinforcement of motivation to encourage the client to utilize their available resources to change (Miller, 1995).

A meta-analysis revealed extensive literature support for MET as significantly more effective than traditional MI (i.e., no assessment feedback) when targeting a specific behavior

changes (e.g., reducing cannabis-related problems) (Lundahl, Kunz, Brownell, Tollefson, & Burke, 2010). In sum, this body of research suggests MET is generally more beneficial and capable of producing desired outcomes (i.e., problem reduction, decreased use) than a traditional MI framework.

Complementary to this, CBT utilizes skill building (i.e., cognitive, emotional, behavioral) and collaboration with the client to address maladaptive thought and belief patterns with the goal of regulating emotional reactions and subsequent self-defeating behaviors (Beck, Wright, Newman, & Liese, 1993). According to Beck (2011), the cognitive model posits that client emotions and behaviors are influenced by their automatic thoughts which stem from core beliefs about themselves, others, and the world around them. Since all components of this model are interconnected, a change to any part is believed to influence the rest (Beck, 2011). Therefore, a change in behavior should alter the emotional response to a situation, allowing the person to challenge his or her automatic thoughts, ultimately adjusting his or her core beliefs. This method of therapy is intended to teach the client to serve as his or her own therapist by recognizing automatic thoughts, behaviors, emotions, or physiological responses, to prevent relapse (Beck, 2011).

Another hallmark of CBT is the inclusion of psychoeducation, in which the therapist explains the cognitive model to the client, using examples from the client's life when possible (Beck, 2011). In the context of substance use treatment, providing the client with an understanding of addiction, and how it is treated, is a fundamental part of the early stages of therapy (Beck et al., 1993).

CBT has been used in many cannabis treatment studies and has consistently demonstrated effectiveness in reducing cannabis use in multiple domains, such as frequency and quantity of

use (McRae, Budney, & Brady, 2003; Gates et al., 2016). One early intervention study found both single session and 6-session CBT for cannabis use generally more effective than delayed treatment, although findings were more robust for participants in the 6-session condition (Copeland, Swift, Roffman, & Stephens, 2001). Similar findings were also reported by Hoch et al. (2012), such that participants who received a 10-session CBT intervention demonstrated significant improvements in primary outcomes (e.g., reduction in use) and most secondary outcomes (e.g., addiction severity) relative to control participants. However, Beck and colleagues (1993) discuss the common tendency for CBT-based treatments to follow abstinence-based disease-models of addiction (i.e., Alcoholics/Narcotics Anonymous). Recent meta-analysis of treatment research has shown this to be the predominant trend within the field (Gates et al., 2016).

Despite its effectiveness, progress within the CBT model of addiction treatment relies heavily on client readiness for change (Beck et al., 1993). The Transtheoretical Model (TTM) has been a consistently used classification for this readiness for many years (Prochaska, DiClemente, & Norcross, 1992; Norcross, Krebs, & Prochaska, 2011). This model classifies problematic substance users into five stages of change: (1) precontemplation, (2) contemplation, (3) preparation, (4) action, (5) maintenance (Prochaska et al., 1992). In the early stages of the model (e.g., precontemplation and contemplation), users typically have little or no motivation to change and may not endorse problems, whereas later stages (e.g., preparation, action, and maintenance) are characterized by increased engagement with therapy (Prochaska et al., 1992). DiClemente and Velasquez (2002) provide support for the use of motivational interventions as being necessary for early stages, and beneficial in all stages. When operating within a traditional

CBT framework, reduction in substance use is a goal designed to help ambivalent clients engage in change, but strong emphasis is placed on encouraging abstinence (Beck et al., 1993).

Despite its historically popular use, several issues with the TTM have been introduced in recent years. Specifically, reviews of the model have noted the TTM oversimplifies the change process (De Biaze Vilela, Jungerman, Laranjeira, & Callaghan, 2009), provides a description of the ideal change process instead of a realistic change (De Biaze Vilela et al., 2009; Mossière & Serin, 2014), and provides weak results when applied to substance use behaviors (Sharma, 2015). Moreover, when the TTM was evaluated in a recent cannabis use intervention study, no significant mediating effect of the model was found, and only some of the stages of change (e.g., contemplation, action) were associated with changes in cannabis use (Dupont, Candel, Lemmens, Kaplan, van de Mheen, & De Vries, 2017). The mounting criticisms of the TTM suggest it may better serve as a descriptive tool for understanding change rather than a clinical tool. As such, the interactive model provided by MET appears more appropriate in treatment settings.

### **Combined Interventions**

Simply increasing motivation for change has been shown to be inconsistent in providing lasting effects (Gates et al., 2016). As noted by Miller and Rollnick (2009), MI does not provide clients with new skills or knowledge necessary to sustain lasting change. Further, research has shown motivational interventions (e.g., MET) to be less effective at sustaining long-term behavior change compared to those involving a CBT component (Stephens, Roffman, Fearer, Williams, & Burke, 2007; Hoch et al., 2014). Thus, additional intervention components, such as assessment feedback and CBT, should be incorporated into treatment.

An approach to this that is supported by the literature is for MI-based interventions (e.g., MET) to be paired with others, such as CBT (Miller & Rollnick, 2002; Naar & Safren, 2017). Moyers and Houck (2011) reported that substance use interventions which combined MI and CBT were generally found to be more effective than MI alone. Given the similarities between MI and MET, and the superior outcomes associated with MET interventions, it is logical to expect a combination of MET with CBT to provide treatment outcomes greater than or equal to MI with CBT interventions. In sum, MET serves to build the client's intrinsic motivation to change and CBT provides the client with the knowledge and skills needed to affect change.

Treatment studies have shown the combination of MET with CBT to be effective at influencing cannabis-related outcomes (e.g., reductions in use/problems; Banes, Stephens, Blevins, Walker, & Roffman, 2014; MTPRG, 2004), and that the inclusion of CBT can significantly bolster MET effects during treatment (MTPRG, 2004). Further, the sustainment of treatment effects has been consistently attributed to the use of CBT (Budney, Moore, Rocha, & Higgins, 2006; Carroll & Kiluk, 2017). Thus, effective treatments utilize the motivation elicited through MET in combination with the skills and information gained from CBT to prepare clients to initiate and maintain change.

### **Current Treatments**

In a recent review, Gates and colleagues (2016) reported that treatments involving CBT, MET, and combinations of these two treatments are effective in producing reductions or facilitating abstinence in cannabis use. Since the components of the most effective cannabis treatments have been consistently shown to include both MET and CBT, a closer look at what makes these effective is warranted.

The most effective interventions identified in Gates et al.'s (2016) review of cannabis interventions were longer (i.e., a minimum of four sessions or total treatment duration of at least one-month), and were delivered in person, either individually or in group sessions. Out of 23 interventions included in the review, six were shown to significantly reduce cannabis related problems (Gates et al., 2016). One study, conducted by Roffman, Stephens, Simpson and Whitaker (1988), found two differences in cannabis-related problems between social skills (SS) and relapse prevention (RP) conditions, both of which consisted of 10-sessions of group therapy. Specifically, participants in the SS condition reported being able to sleep more easily than those in the RP condition, and RP participants endorsed remembering and using information from treatment to avoid negative consequences while the SS participants did not (Roffman et al., 1988). In short, results indicated significant differences between groups for two indicators of cannabis-related problems, however the two conditions appeared to have similar impact on this treatment outcome. Further, a subsequent study of the same design (e.g., 10-sessions of group-based RP and SS) failed to replicate these findings (Stephens, Roffman, & Simpson, 1994). The remaining five studies included in the review which significantly reduced cannabis-related problems utilized CBT, MET, or a combination of the two (Gates et al., 2016). Given the lack of dependable evidence for either RP or SS, and the effectiveness of studies which employ MET and/or CBT in reducing cannabis-related problems, only MET, CBT, or combined MET and CBT interventions are further considered.

Consistent evidence across five studies included in the review emerged supporting MET and/or CBT interventions as being effective in reducing cannabis-related problems in addition to other outcome variables (e.g., reductions in use frequency; Gates et al., 2016). The intervention components for these studies are described below with special attention focused on active

ingredients and mechanisms of change. Since some studies included more than one type of treatment (e.g. MET+CBT, MET-only, CBT-only), results from each study are considered individually instead of being clustered by treatment type. Lastly, effect sizes for significant reductions in cannabis-related problems are reported when provided in the study results.

The Marijuana Treatment Project Research Group (MTPRG, 2004) performed a multi-site study comparing a 2-session MET condition and a 9-session MET with CBT condition to a delayed treatment control (DTC). Their findings indicated a significant reduction in cannabis-related problems for the MET with CBT condition relative to both the MET-only and DTC conditions (MTPRG, 2004). Significant reductions in cannabis use frequency variables were reported for MET with CBT ( $d = .91$ ) and MET-only ( $d = .60$ ), however only the MET with CBT condition significantly reduced cannabis-related problems ( $d = .53$ ; MTPRG, 2004). Findings suggest the inclusion of CBT may contribute to the likelihood of reductions in problems associated with use.

Second, Lee and colleagues (2013) conducted a multi-site clinical trial among college students testing a single session MET intervention against a DTC. Participants in the MET condition reported a significant reduction in quantity (e.g., joints smoked per week) but not in frequency (e.g., days smoked per week) of use, as well as a 10% reduction in cannabis-related problems, however no effect sizes were reported (Lee et al., 2013). Notably, intervention effects were seen at a 3-month follow-up, but none were present at 6-months (Lee et al., 2013).

A third multi-site randomized controlled trial compared a 10-session MET, CBT, and problem-solving intervention to a DTC (Hoch et al., 2014). The treatment condition reported significantly higher rates of cannabis abstinence ( $d = .70$ ), as well as lower rates of dependence symptoms ( $d = 1.80$ ), and fewer cannabis-related problems ( $d = 1.30$ ; Hoch et al., 2014).



Although abstinence rates decreased substantially from post-assessment to 3-month follow-up, all effects of the intervention remained significant at 6-month follow-up (Hoch et al., 2014). The large effect sizes observed across multiple study outcomes provides strong support for the combination of MET and CBT as being the most effective treatments currently available in cannabis treatment.

Fourth, Copeland and colleagues (2001) tested the relative effects of 6-session CBT and 1-session CBT with a DTC. Results indicated both the 1-session and 6-session CBT interventions significantly reduced number of cannabis related problems compared to the DTC, and that the two interventions did not differ significantly from one another (Copeland et al., 2001). Effect sizes for the 1-session ( $d = .74$ ) and 6-session ( $d = .96$ ) conditions were both large (Copeland et al., 2001) suggesting that a single session of CBT can produce substantial reductions in cannabis-related problems.

Fifth, Stephens, Roffman, and Curtin, (2000) compared a 14-session CBT/social support treatment, two sessions of MI which incorporated cognitive-behavioral techniques, and a DTC. Results indicated significant reductions in frequency of use, dependence symptoms, and number of cannabis-related problems for both the 14-session and 2-session treatments over DTC participants (Stephens et al., 2000). In addition, no differences were seen between the 14-session and 2-session conditions on any measures (Stephens et al., 2000), suggesting the brief treatments can yield a similar level of effectiveness as longer ones. Moreover, effect sizes for reductions in cannabis-related problems were comparable for the 14-session condition ( $d = 1.04$ ) and 2-session condition ( $d = 1.13$ ) compared to the DTC condition at 4-month follow-up (Stephens et al., 2000). The similarity in outcomes for both treatment conditions is indicative of common benefits for treatments incorporating CBT.

Worth noting are the commonalities across these five studies. For all studies, participants ranged from late-twenties to mid-thirties (Copeland et al., 2001; Hoch, 2014; MTPRG, 2004; Stephens et al., 2000) except one which was conducted with a college sample (Lee, 2013). Additionally, all studies reported most participants being male (Copeland et al., 2001; Hoch, 2014; MTPRG, 2004; Stephens et al., 2000; Lee, 2013), and white Caucasian (MTPRG, 2004; Stephens et al., 2000; Lee, 2013) or did not include demographic data on race/ethnicity (Copeland et al., 2001; Hoch, 2014).

Additionally, a later study by Stephens and colleagues (2007) compared MI and personalized feedback (PF), multimedia feedback (MMF), and a delayed feedback control (DFC) conditions among cannabis users who were ambivalent about change. Participants in the PF condition reported significant reductions in cannabis use frequency and dependence measures compared to those in the MMF and DFC conditions, however no significant reduction in problems was detected (Stephens et al., 2007). Further, the PF intervention effects were inconsistent in maintaining significant benefits for outcome variables compared to the MMF condition across long-term follow-ups (Stephens et al., 2007).

When comparing Stephens et al. (2000) and Stephens et al. (2007), the magnitude of changes in shared outcome variables (e.g., frequency of use, dependence symptoms) was markedly lower when CBT was not included in the intervention (Gates et al., 2016). For example, effect sizes for outcome variables when CBT was not included in interventions were moderate ( $d = .42-.47$  for use frequency,  $d = .48-.58$  for dependence symptoms; Stephens et al., 2007) whereas when CBT was included, large effects were found ( $d = .85-1.01$  for use frequency,  $d = 1.00-1.01$  for dependence symptoms) when comparing treatment to control conditions at 4-month follow-up (Stephens et al., 2000). Since no significant reductions for

cannabis-related problems were present in one of these studies (Stephens et al., 2007), no similar comparison can be drawn.

In addition to differences in treatment outcomes, substantial variability was reported for therapist training and credentials. Broad categories of therapist training identified in the review by Gates and colleagues (2016) included manual review, didactic training, and role play practice. Across all 23 studies in the review, four reported using all three categories in the training of therapists, seven reported a combination of two categories, another seven reported using one category, and five did not provide information on how therapists were trained (Gates et al., 2016). The most common training method was manual review (14 studies), followed by didactic training (11 studies), and role play practice (8 studies; Gates et al., 2016).

Therapist credentials reported across studies were generally limited in detail and primarily based on the degree(s) held by therapists. Degree levels of therapists in the studies were reported as doctorate (5 studies), masters or a combination of masters and doctorate (13 studies), bachelors through doctorate (2 studies), bachelors or lower (1 study), or were not reported (2 studies; Gates et al., 2016). Seven studies provided further detail on whether therapists were trained in a specific modality. Among these, three indicated formal training in CBT (Edwards et al., 2006; Hoch et al., 2014; Madigan et al., 2013), another three indicated that therapists were experienced with behavior therapy (Hoch et al., 2012; MTPRG, 2004; Stephens et al., 2007), and one noted “clinical experience with CBT” (Litt, Kadden, & Petry, 2013). Collectively, these differences in therapist training and credentials create potential for confounds in how treatment outcomes are interpreted.

## **Additional Treatment Considerations**

Barriers to treatment for substance abuse vary widely, however not wanting to stop using (i.e., abstinence) and fear of stigma associated with treatment have been consistently identified as reasons for not pursuing currently available treatment options (No et al., 2004; Gates et al., 2012). According to Miller (1983), one of the key principles of motivation for substance misuse treatment is de-emphasizing labeling. Stigma associated with being labeled as a drug user has been consistently identified as one of the most common barriers to cannabis treatment (Gates, Copeland, Swift & Martin, 2012; Gates & Copeland, 2017). It follows that by removing the emphasis on labeling, this barrier is effectively reduced because it counteracts stigma. More recently, surveys of current cannabis users indicate that many prefer to pursue changes in their use without ongoing assistance (Kerridge et al., 2017; Gates & Copeland, 2017).

Facilitators of treatment have also been identified in the literature. Gates and colleagues (2012) reported that cannabis-specific treatments and streamlined admission processes both significantly increase the likelihood of treatment engagement for cannabis users. However, even for those admitted into treatment programs, attrition continues to present challenges. Studies have shown a retention rate of 65% in longer courses of treatment (i.e., 10 sessions across 14 weeks) (Hoch et al., 2014). When treatment lasted two sessions, retention was increased to 86% (Stephens et al., 2000). Taken together, the evidence points to a growing need for a brief, cannabis-specific intervention that can be easily accessed by treatment seekers.

Recent research has begun investigating the impact of sex differences on cannabis use. Even though men are disproportionately represented in cannabis treatment studies (Gates et al., 2016), women may be significantly more susceptible to developing CUD (Cooper & Haney, 2014). Not only do women report the effects of cannabis use as “good” more than men and

endorse higher likelihood of re-engaging in cannabis use than men (Cooper & Haney, 2014), they also report more severe withdrawal symptoms compared to men (Herrmann, Weerts, & Vandrey, 2015; Sherman et al., 2017). The combination of these factors suggests potential for men and women to respond differentially to treatment, resulting in differences in reported outcomes.

A final consideration was the type of comparison group to be used in the present study. A review by Karlsson and Bergmark (2015) reported a great deal of variation in the types of control conditions being used in substance use research (e.g., no treatment, treatment as usual, other psychosocial treatment), and the common tendency for studies to omit rationale for their chosen design. Wampold (2001) outlined the importance of control condition type, stating that the use of a no treatment control group prevents discrimination between intervention effects and general effects of therapy (e.g., common factors). Therefore, the present study utilized an active comparison condition which bears no similarity to the experimental treatment except for the common factors. One such treatment, originally developed for use in a web-based treatment for cannabis, is known as healthy stress management (HSM), which involves mindfulness and breathing exercises (Riggs, Conner, Parnes, Prince, Shillington, & George, 2018).

The purpose of the present study was threefold: (1) to develop a single-session, harm reduction intervention aimed at reducing cannabis-related problems, (2) to establish a uniform protocol for therapist training and treatment fidelity, and (3) to test the efficacy of this intervention approach. The treatment design was intended to incorporate the most effective practices (i.e., treatment modalities) while addressing gaps in current intervention literature in five ways. First, it centered the attention of treatment on reducing negative consequences associated with cannabis use. Individuals who receive treatment for a cannabis use disorder

(CUD) are much more likely to have a more severe addiction (Kerridge et al., 2017) which puts them at a higher likelihood of experiencing negative consequences (Dvorak & Day, 2014). The current study proposed that maintaining focus on reducing negative consequences, instead of promoting abstinence, more closely aligned with the client's reasons for being in treatment. Therefore, recruitment efforts were tailored toward individuals with an interest in evaluating their cannabis use patterns. Frequency and quantity of use were secondary to problem reduction, which was unique in relation to other cannabis treatment designs.

Second, a harm reduction approach was used. From an MI perspective, attempting to pressure a person into abstinence when they are not intrinsically motivated for it is more likely to fortify their attitude against change (Miller, 1983). Additionally, research on alcohol treatment has repeatedly demonstrated that abstinence is not a necessary goal to reduce substance use behavior (Sobell & Sobell, 1973; Sobell, Cunningham, & Sobell, 1996). Allowing for flexibility in goals (i.e., reducing problems vs quitting) was believed to facilitate a more effective intervention.

Third, the intervention was delivered in a single session. This served to address several issues identified in the current literature. Not requiring clients to return for a follow-up session ensured that anyone who attends the session would receive the full course of treatment, reducing potential for attrition. It also addressed some barriers (e.g., stigma, preference against ongoing treatment) identified in prior research (Kerridge et al., 2017; No et al., 2004). Similarly, the specificity to cannabis likely served a facilitating role (Gates et al., 2012) due to only focusing on topics relevant for the individual in treatment.

Fourth, the intervention contained both MET and CBT components. As previously discussed, there is extensive support for these modalities as being integral components of

effective treatment of problematic cannabis use (Gates et al., 2016). As such, this distilled (i.e., brief) version of treatment maintained the components known to be consistently effective in producing beneficial results for individuals who receive treatment.

Finally, the present study provided a standardized training protocol which incorporated multiple categories of training (i.e., manual review, didactic training, role play practice). As noted previously, studies report notable variability in the number and types of methods used to train therapists. Establishing a formal approach toward therapist training that incorporates all categories used in previous research reduced the potential for confounds. In turn, this may serve as a training model that can be replicated in future trials.

**Hypothesis 1:** Therapists who underwent a rigorous training protocol (i.e., multimethod including didactic training, manual review, and role play practice) would be able to demonstrate total protocol adherence and deliver a manualized intervention with a high degree of treatment fidelity.

**Hypothesis 2:** Individuals who received a brief, harm reduction, cannabis-specific, MET + CBT intervention would report experiencing significantly fewer cannabis-related problems than those in a healthy stress management (HSM) control condition.

## METHODS

### Participants

Participants ( $n = 26$ ) were recruited via on-campus advertisements, fliers, social media outlets (i.e., Facebook), and through the undergraduate research participation requirement for psychology courses at Colorado State University. Inclusion criteria were modified partway through the study to allow for a wider range of eligibility. Inclusion criteria: (1) between 18-65 years old, (2) reports current use of cannabis in any form (e.g., flower, edibles, concentrates), and (3) no mental illness or cognitive impairments that would affect ability to participate in a research study. The following criteria were removed from initial inclusion criteria but retained in the screening survey to assist in data analysis: (1) reports current, regular cannabis use in any form at least twice per week, (2) interested in reduction or cessation of cannabis use, and (3) primary substance-use concern is cannabis. Exclusion criteria: (1) current enrollment in another substance use treatment program, (2) severe mental illness diagnosis, (3) cognitive impairments that may interfere with ability to participate, (4) under 18 or over 65 years old, and (5) currently pregnant or planning to become pregnant.

Eligible participants were randomly assigned to either the CST ( $n = 13$ ) or HSM ( $n = 13$ ) intervention condition upon initiation of the baseline survey. Demographic information for the baseline sample was grouped by study condition and provided in Table 2. Participants were invited to complete a follow-up survey 4 weeks after receiving their designated intervention. A \$10 Amazon gift card, delivered via email, was offered as incentive for participation in the follow-up survey. Approximately 62% of the baseline sample were retained across time points and included in analyses. Attrition was markedly higher among participants assigned to the CST



condition than for the HSM condition. Differential attrition rates across study conditions are illustrated in Figure 1 alongside recruitment source (i.e., community or undergraduate research pool). The analytical sample ( $n = 16$ ; CST  $n = 5$ ; HSM  $n = 11$ ) were predominantly White students from the undergraduate research pool who attended their session in-person. Demographic information for the analytical sample was grouped according to study condition and presented in Table 3.

### **Measures and Materials**

The primary outcome of interest was reduction in number of self-reported cannabis-related problems. This outcome was measured using the Cannabis Problems Questionnaire (CPQ; see Appendix D). The CPQ is a 21-item self-report measure developed to assess presence of cannabis problems across social (e.g., being criticized for use), psychological (e.g., felt a lack of motivation), and physical (e.g., becoming ill after use) domains (Copeland, Gilmore, Gates, & Swift, 2005). In a clinical trial using the CPQ, regular cannabis users reported an average of 6.7 cannabis-related problems prior to treatment and 1.9 at follow-up (Hoch et al., 2014). This finding suggests the CPQ is sensitive to detecting changes in problematic use patterns.

Secondary outcomes included reduction in cannabis dependence, use frequency, and intensity. The Severity of Dependence Scale (SDS) was used to measure current cannabis dependence symptoms (see Appendix C). The SDS is a five-item scale designed to screen for psychological markers of dependence through impaired control (Swift, Copeland, & Hall, 1998). SDS scores are based on a total of 15 possible points, with three being the recommended cutoff for cannabis dependence (Swift, et al., 1998). The SDS has demonstrated reliability in detecting dependence symptoms for cannabis use regardless of participant age (Martin, Copeland, Gates, & Gilmour, 2006; Hoch et al, 2014).

Information regarding cannabis use patterns was collected via a Timeline Followback (TLFB) Assessment. The TLFB method was used to gather information regarding frequency and quantity of substance use, which days a person used, and amount of time spent using (Sobell & Sobell, 1992). In the present study, this was limited to cannabis use and included days and time periods of use, quantity of cannabis used, and route of administration (see Appendix B). A meta-analysis of studies using TLFB assessment found it to be a reliable measure for reported cannabis use (Hjorthøj, Hjorthøj, & Nordentoft, 2012).

The “My Contract for Change” materials developed for *CANDIS: A Marijuana Treatment Program for Youth and Adults* (Hoch et al., 2017) were used as a model for the Change Plan (CP) used in the fourth component of the present study (see Appendix I). In the “My Contract for Change” materials, Hoch and colleagues (2017) work with clients to develop a signed document containing a goal, target quit day, reasons for changing cannabis use, strategies to assist them, and rewards for meeting goals. Similarly, the CP contains at least one goal statement, a target change date, reasons and strategies for change, and reward structure for successful goal attainment. The CP did not include signatures by either the therapist or participant.

At the time of initial assessment, participants were also provided the Marijuana Decisional Balance (MDB) scale (Appendix H; Elliott, Carey, & Scott-Sheldon, 2011). This scale contains 24 items (8 pros, 16 cons) shown to reliably assess cannabis user’s perceived benefits and negative outcomes of use (Elliott et al., 2011), and has been further shown to have predictive validity for problems and dependence symptoms (Elliott, & Carey, 2013). Participant responses to items on the MDB were included in session materials provided to the therapist.

Finally, participant's subjective ratings of stress were also collected using the 10-item version of the Perceived Stress Scale (PSS; Cohen, Kamarck, & Mermelstein, 1983). The psychometric properties of the 10-item version of the PSS have shown acceptable reliability ( $\alpha > .70$  across 12 studies), particularly among samples of college students and workers, and outperform the properties of the 14-item and 4-item variants (Lee, 2012). Responses to this measure were not included in session materials reviewed by the therapist during assessment feedback with participants.

All measures were administered via Qualtrics<sup>®</sup> prior to receiving either the CST or HSM interventions to establish a baseline for all participants. Four weeks after receiving either intervention, participants were invited to complete a follow-up survey consisting of the same measures administered at baseline. The follow-up survey was also administered online through Qualtrics<sup>®</sup>.

## **Procedure**

To test the effectiveness of a brief cannabis intervention, a randomized controlled trial (RCT) was conducted using laboratory office spaces at Colorado State University (CSU) and online teleconferencing software (i.e., Zoom). Ethical approval was obtained from the CSU Institutional Review Board (IRB) for research involving human subjects. Participants were screened for eligibility prior to inclusion in the study using a questionnaire (see Appendix M). Informed consent was acquired at that time.

## **Experimental Condition**

The experimental treatment condition consisted of a combination of Motivational Enhancement and Cognitive Behavioral Therapies specific to cannabis, lasting 60-90 minutes. In this condition, participants received a manualized treatment with four components: (1)

assessment result feedback, (2) psychoeducation about cannabis, (3) a decisional balance exercise, and (4) goal setting.

### *Assessment Feedback*

In the first component, assessment feedback was presented based on participant responses to questionnaires designed to measure current cannabis use patterns (e.g., frequency and quantity), cannabis-related problems, and dependence severity (see Appendix F). Therapists provided a summary of the use pattern and asked the participant to describe how this pattern typically manifests for them. Following this, participant responses to the Severity of Dependence Scale (SDS) were reviewed. Based on the pre-determined cut-off score provided by the SDS, participants received feedback on whether they met criteria for dependence. The therapist then facilitated a discussion about the participant's reaction to hearing these results.

Next, the results of the Cannabis Problems Questionnaire (CPQ) were reviewed. The therapist began by briefly familiarizing the participant with the purpose and scope of the scale. The presentation of this section of feedback was two-fold. First, the therapist led a discussion of the overall CPQ score and how it relates with those from a previous clinical trial. Following this, the participant's scores across each subscale contained within the CPQ were used to highlight the participant's reasons for changing use in greater detail. This component was concluded with a discussion of the interaction of assessment results. Participants related their use pattern to both their SDS and CPQ scores. Specifically, scores for the SDS were discussed in relation to the CPQ.

### *Psychoeducation about Cannabis*

The second component of the experimental treatment condition provided the participant with psychoeducation about cannabis use and its impacts using the biopsychosocial model

(BPSM) of addiction (see Appendix G). The biological aspect of the BPSM was reviewed first and began by establishing an understanding of how THC impacts the brain. Although there are several compounds present in cannabis, THC is most responsible for both the pleasurable effects (i.e., feeling high) as well as negative effects (i.e., withdrawal) (Julien, Advokat, & Comaty, 2011). In relation to its known effects as an exogenous cannabinoid, THC mimics the endogenous cannabinoid anandamide, which over time leads to down-regulation of cannabinoid receptors (e.g., tolerance) and withdrawal symptoms when not used (Julien et al., 2011).

In a previous treatment study, this information was used to inform participants about cannabis dependence and the biological factors (e.g., tolerance, withdrawal) which play a role (Hoch et al., 2017). As such, in the present study the therapist discussed four biological consequences associated with cannabis use: (1) how cannabis impacts the brain, (2) tolerance, (3) dependence, and (4) withdrawal. The therapist provided participants with a basic understanding of synapses and the neurotransmitters in the brain impacted by cannabis consumption. This included discussion of endogenous and exogenous cannabinoids (i.e., anandamide and THC).

Next, the therapist related the concept of tolerance to receptor down-regulation. This provided participants with an understanding of how tolerance occurs at the synaptic level. After this, the therapist built on what was already discussed with information about dependence. By relating this information back to previous points (i.e., tolerance), the participant gained a procedural understanding of how dependence develops. The therapist then concluded the biological psychoeducation with information on withdrawal. At this time, the participant gained knowledge on common symptoms associated with reduction (or cessation) of cannabis use.

Additionally, a timeline detailing typical withdrawal symptom onset and duration was discussed with the participant to prime them to consider anticipated challenges.

Following this, the psychological component of the BPSM was covered. This emphasized how classical conditioning creates learned expectations for use. Robbins, Ersche, and Everitt (2008) reported that drug use is often a conditioned behavior, such that seeing paraphernalia associated with use can be triggering. Conversely, exposure to an environment without the presence of triggering items has been shown to diminish the likelihood of use (Kaplan, Heinrichs, & Carey, 2011). Therefore, participants were encouraged to consider removing any potentially triggering items (i.e., bongs, wrapping papers) which may be present in their home.

The social element of the BPSM was used to conclude the psychoeducation piece and transition into the remaining components of the intervention. Epidemiological studies of social influence have consistently revealed that peer networks have a significant impact on cannabis use (Galea, Nandi, & Vlahov, 2004). To relate with these findings, the participant was encouraged to evaluate the social influences commensurate with use. During discussion of each BPSM component, information was linked back to the participant's use pattern to connect the concepts to experiences which are salient for them.

#### *Reasons for Change and Sustainment*

The third component of the intervention included an exploration of reasons for change and reasons for sustainment and their salience. As noted by Miller and Rose (2015), the decisional balance (DB) exercise is an established method for weighing pros and cons of substance use. Despite being commonly viewed as a 2x2 table comparing changes and status quo with positive and negative aspects of use (Miller & Rose, 2015), research supports the use of a scaled version (see Appendix H; Elliott et al., 2011).

Participant responses to scale items were reviewed with the therapist during this component of the intervention. Given the tendency for DB to be more effective when used directionally (e.g., focused on reasons for change; Miller & Rose, 2015), endorsement of reasons in support of change were emphasized over reasons for sustaining the status quo. In doing so, the therapist began to transition the participant into consideration of goals.

### *Goal Setting*

The final component of the intervention assisted the participant in establishing short- and/or long-term goals relating to their use. Goals for which people are intrinsically motivated have been shown to be more likely to be attained (Kasser & Ryan, 2001). Moreover, research has demonstrated that establishing clear goals is predictive of reaching desired treatment outcomes (e.g., moderation or abstinence) for cannabis dependence (Lozano, Stephens, & Roffman, 2006). Thus, goal setting in this study was informed by the participant's reasons for change as indicators of intrinsic motivation, and were distilled into brief, measurable statements. A common approach to this is developing SMART goals (specific, measurable, achievable, realistic, and timed), which have been consistently shown to contribute to goal attainment in substance use treatment (Schut & Stam, 1994; Bovend'Eerd, Botell, & Wade, 2009).

The first item included on the CP was SMART goal development. In addition, the participant and therapist also established a target date for change implementation. Further, a brief list (e.g., 3-4 items) of salient reasons to change were compiled along with at least one strategy to assist the participant in reaching their goal. To conclude goal setting, ways in which the participant can reward themselves when meeting their goals were discussed.

## **Control Condition**

Participants in the control condition received a session reviewing Healthy Stress Management (HSM). The HSM materials were originally developed for use as a comparison condition in a web-based cannabis treatment study (Riggs et al., 2018). All materials for the HSM condition in the present study were adapted from this previously developed HSM intervention. An in-person version of the HSM materials used by Riggs and colleagues (2018) was delivered over the course of a 60-minute session consisting of three components, each lasting for approximately 20 minutes.

The first component was a review of the levels of stress. Therapists discussed the differences between the levels of stress (e.g., low, moderate, and high) and solicited feedback from the participant for when they have experienced each in their own life. Low levels of stress were characterized as healthy and not typically noticed. Moderate stress was described as potentially positive or negative. Therapists described positive moderate stress as potentially motivating for task completion, and negative moderate stress described as overwhelming. Finally, high levels of stress were characterized as unhealthy and commonly associated health complications, such as sleep and appetite disturbances.

The second component addressed ways to cope with stress by introducing the “Four A’s” (e.g., avoid, alter, accept, adapt) and how they can be used for stress management. First, the strategy to Avoid was explained as the tendency for an individual to prevent themselves from entering a situation they deem too stressful. Next, Alter was described as an approach to developing alternatives. For example, if the source of stress is an excessive workload, an alternative is re-evaluating time management to accomplish the task. Third, the therapist reviewed Accept as the ability to recognize a stressful situation, accept that the feelings of stress



are expected, and allowing time or space to deal more effectively with it. Lastly, therapists described Adapt as the ability to redefine personal expectations to more effectively cope with stress. During each of the “Four A’s”, participants were provided a list of example strategies from which to choose. Therapists facilitated a discussion of at least one example strategy for each of the “Four A’s” and solicited examples from the participant for how it may relate with their personal experiences.

The HSM condition culminated with a collaborative exercise in which the participant worked with the therapist to develop a list of personalized coping strategies. This exercise was written during the session, and therefore unique to each participant. Strategies developed included at least one component from prior stages of the HSM condition but were not limited to it. The therapist related information covered in session to the coping strategy. If more than one coping strategy was created, at least one was chosen by the therapist to relate with prior information from the session.

### **Therapists and Setting**

Study therapists consisted of four Colorado State University (CSU) graduate students. Two therapists (1 female, 1 male) had completed formal MI and CBT coursework as part of their training in the Masters in Addiction Counseling of Psychology (MACP) program at CSU. The remaining two therapists (both female) held master’s degrees in either psychological science or mental health counseling and were currently enrolled in the counseling psychology PhD program at CSU. One had completed formal coursework in MI only, while the other had formal coursework in CBT only. The MI and CBT training of the therapists in the doctoral program was taken as semester long courses within the MACP program. In addition, one of the MACP therapists became a counseling doctoral program student during his involvement in the study. All

therapists had between 1-2 years of experience in face-to-face counseling prior to their involvement in the study. Differences in select participant characteristics (i.e., study condition, attrition, recruitment source, session setting) across study therapists are shown in Table 1.

Training of therapists for the study included a didactic seminar, manual review, and role play practice. During the didactic seminar, therapists were provided with a review of MI and CBT concepts with emphasis placed on how those concepts relate to the intervention conditions. The didactic training also included instructions for how to manage special cases (e.g., participants arriving intoxicated), familiarization with assessment measures, and data handling procedures (see Appendix L). Therapists were provided personal copies of the treatment manuals (see Appendix O for CST and Appendix P for HSM) for both conditions which were reviewed during the training seminar and on an individual basis. Prior to seeing participants, therapists were required to effectively demonstrate their ability to deliver session content in a lab setting by reaching 100% treatment fidelity for both conditions. Treatment fidelity for the role plays was assessed using the same fidelity checklist (Appendix J) used to rate sessions with participants. Study therapists were provided with personalized feedback about their performance on each role play condition and given remediation on session content when 100% fidelity was not achieved. Upon completion of all components of training (i.e., manual review, didactic training, role play practice), study therapists were expected to achieve 100% treatment fidelity for both study conditions when conducting sessions with participants.

Therapists were supervised by either a Licensed Addiction Counselor (LAC) or a Licensed Psychologist. One therapist attended LAC supervision monthly per state requirements while the remaining therapists attended group supervision with a Licensed Psychologist as needed due to inconsistent recruitment patterns and a lack of steady flow for participant

enrollment. In addition to supervision, all interventions were either audio or video recorded based on participant preference and kept on a secure server for the duration of the study. Approximately one-third (30%) of recordings were reviewed and scored to verify and assess treatment protocol adherence (see Appendix J). Therapists were compensated by receiving clinical face-to-face hours to be counted toward licensure. Therapists were trained to provide referrals (see Appendix K) for local on-going mental healthcare options. In the case of a high-risk client (e.g., suicidal or homicidal ideation), referrals to an appropriate higher level of care were provided via the resources list.

Treatment settings included in-person and teleconference-facilitated (i.e., Zoom) sessions. In-person sessions were hosted in lab offices on campus at CSU. Lab offices contained no external markings that could be used to identify them as the site of a clinical trial. White noise machines were used to ensure confidentiality during sessions. Teleconference sessions were introduced beginning on April 21, 2020 in response to public health requirements resulting from COVID-19. Therapists conducted sessions remotely with reasonable precautions taken to ensure confidentiality of participants. All teleconference-facilitated recordings were transferred to the same secure server used to store in-person recordings upon completion of the session.

### **Analysis Plan**

All analyses were conducted using IBM SPSS Statistics for Windows, Version 26 (IBM Corp., 2019). Reference groups were assigned according to condition (0 = HSM, 1 = CST) and sex (0 = male, 1 = female). Descriptive statistics were reported outlining therapist training, attrition, and evaluation of competency for delivering session content. In addition to evaluation of the therapist training protocol, clinical significance was also considered in descriptive analyses. Specifically, reduction in distress from cannabis-related problems, no longer meeting

criteria for dependence, and successful attainment of personal goals for use were used to determine if clinically meaningful results were obtained by participants in the study. Reductions greater than or equal to three on ratings of distress from cannabis-related problems were considered clinically significant. Goal attainment ratings of 5 or higher were considered as having successfully reached the goal. These were considered alongside other covariates (e.g., baseline use, number of problems) to account for potential confounds.

A 2X2 repeated measures Analysis of Covariance (ANCOVA) was conducted to test for differences in cannabis-related problem reduction by treatment condition (i.e., CST vs HSM) and time (i.e., baseline vs follow-up) while controlling for related variables (i.e., sex, baseline problems). Results of the F-test were used to determine if participation in the experimental treatment condition led to significant reductions in cannabis-related problems. Given that the necessary assumptions of ANCOVA (e.g., normality) are not typically met for key variables (i.e., cannabis-related problems), evaluation of the appropriateness for the selected analyses were also conducted. Recommended ranges of +1 to -1 for skew and +2 to -2 for kurtosis were used as thresholds for determining if the assumption of a normal distribution was sufficiently met prior to conducting analyses (Garson, 2012).

## RESULTS

### **Therapist Training**

A total of 11 therapists completed manual review and didactic training for both the CST and HSM interventions. Of these, seven progressed to role play practice phase of training. Five therapists completed role play training and were then eligible to conduct sessions with participants. Four of the five therapists who completed all phases of training conducted sessions with participants. Therapist attrition at various stages of training is illustrated in the consort diagram (Figure 2). Among the therapists who held sessions with participants, only one requested additional role play practice prior to being evaluated for protocol adherence.

### **Treatment Fidelity**

Fidelity assessment of role play sessions included review for all seven therapists who reached that stage of training. Only one therapist failed to reach 100% treatment fidelity during the role play of the CST condition due to the omission of discussing the interaction between the SDS and CPQ scales and what “ideal” use would be for them. Two therapists failed to achieve 100% treatment fidelity in role plays for the HSM control condition. One session contained cross-contamination, where SMART goals were erroneously discussed during coping strategy development, and the second contained MI inconsistencies in the form of advice-giving.

Approximately 30% of sessions conducted with study participants were selected for treatment fidelity evaluation. Average treatment fidelity for the CST condition was 98%, with one of the sessions reviewed omitting the discussion of SDS and CPQ score interaction. None of the HSM sessions conducted with participants contained treatment fidelity errors. Table 4

provides a full comparison of treatment fidelity and session length for role play and participant interventions across both conditions.

## **Participant Outcomes**

### *Cannabis-Related Problems*

Estimates of skew and kurtosis for the CPQ were within an acceptable range to be treated as normally distributed at both time points (Table 5). Results for the main comparison of interest indicated a non-significant effect for intervention condition on reductions in cannabis-related problems  $F(1, 11) = .042, p = .841, \eta^2 = .004$  when controlling for sex and baseline problems. Findings further indicated that baseline CPQ scores accounted for 61.7% of the variance in follow-up CPQ scores. Full model results are reported in Table 6. Additionally, change scores for participant CPQ totals were similar across conditions, with CST participants reporting changes within  $\pm 2$  and HSM participants reporting changes between  $-4$  and  $+3$  problems. Baseline, follow-up, and change scores on the CPQ for all participants are reported in Table 7.

### *Distress and Dependence*

Comparison of self-reported distress ratings across time points indicated clinically significant reductions in distress from cannabis-related problems for two participants in the HSM condition. Both participants reported reducing baseline distress by 3. Conversely, one participant in the CST reported an increase of 5 in distress from baseline to follow-up. No participants in the CST condition reported a clinically significant reduction in distress from baseline to follow-up. Distress ratings across time points are shown in Table 8.

Change scores for dependence, as measured by the SDS, were generally small across conditions, with 11 of the 16 participants reporting a change within  $\pm 1$  from baseline to follow-up. One participant from each condition reported a decrease in SDS score at follow-up such that

they no longer met criteria for dependence. In the CST condition, the reported reduction was 5, while the HSM participant reported a reduction of 1. Finally, one participant from the HSM condition reached criteria for dependence after reporting an increase of 1. All SDS scores are reported in Table 9.

### *Goal Attainment*

Participants were asked to rate their subjective success in meeting one or more goals either selected from three predetermined options (i.e., Abstinence, Reduction in Use, Reduction in Problems) or a personalized goal. The most common goal type endorsed was to reduce use ( $n = 8$ ), followed by reducing cannabis-related problems ( $n = 6$ ), personalized goals ( $n = 3$ ), and abstinence ( $n = 2$ ). One participant did not endorse any goal type.

Average participant goal attainment ratings were similar across CST ( $M = 5.5$ ,  $SD = 2.43$ ) and HSM ( $M = 5.3$ ,  $SD = 2.25$ ) conditions. To account for effects of outliers on mean scores, particularly with a small sample, median and modal scores were also considered in descriptive analyses. Median ratings indicated that participants in the CST condition typically reported higher levels of goal attainment than HSM participants (CST  $Mdn = 6.5$ ; HSM  $Mdn = 5$ ). Modal scores further illustrated the difference in goal attainment across conditions (CST  $Mode = 7$ ; HSM  $Mode = 4$ ).

Goal attainment was generally highest among participants who identified a personalized goal, regardless of study condition. One participant in the CST condition identified a personalized goal (“*Management of use*”), which they reported as 7/10 for degree of goal attainment. Two participants from the HSM condition identified personalized goals, reporting a 9/10 (“*My cannabis use aids in several chronic health conditions I have, while I have a longterm*

*history of self-medicating with cannabis, my current use is under the guidance of my Primary Care Physician”) and 10/10 (“Continue use till I die”) for degree of goal attainment.*

Among participants who did not develop a personalized goal, those in the CST condition tended to report higher success in goal attainment. Only one participant from the CST condition reported goal attainment ratings of 3/10 (for reduction in use) and 2/10 (for reduction in problems). All other CST participants reported between 6-8/10 for reaching their goals. Comparatively, goal attainment in the HSM condition for participants without a personalized goal ranged from 3-7/10.

The most notable difference in goal attainment between conditions was seen for participants who indicated no interest in making changes to their cannabis use and did not identify a personalized goal. In the CST condition, each participant who indicated that they were not interested in changing their use reported a goal attainment rating between 6-8/10, while those in the HSM condition reported between 3-5/10. Differences in goal attainment scores for each condition, as well as participant interest in change, are shown in Figure 3. All participant goal attainment ratings and associated measures of central tendency are reported in Table 10.

### *Cannabis Use Changes*

Cannabis use was reported in number of using days over a four-week period using a TLFB. Each day was separated into four six-hour periods to allow for greater detail. Participants reported a notable difference between conditions for number of use periods and using days. All participants in the CST condition reported reductions in number of use periods ranging from 5 to 11 fewer use periods over the 28-day span. Reductions in use periods also reflected fewer using days for all except one CST participant, who reported no change in number of using days.



HSM participants reported a wide range of changes in both use periods and using days. Seven HSM participants reported between 1 and 51 use periods, with six also reporting between 1 and 21 fewer using days. However, four participants from the HSM condition reported either no change or an increase in number of use periods, and five indicated either no change or an increase in using days at follow-up. Number of use periods, using days, and change scores for both time points and conditions are reported in Table 11.

## DISCUSSION

The present study sought to provide substance use researchers and treatment providers with an additional option for treatment of cannabis-related problems, a standardized approach to training of therapists for manualized interventions, and assessed the feasibility of this intervention approach. The outcomes for each aim are discussed in sequence. The first aim of the present study was the development of a brief, manualized, harm-reduction intervention for the reduction of cannabis-related problems that may be easily administered by trained therapists (Appendix O). Intervention development was accomplished through evaluation of the available treatment literature to identify current best practices for treatment of cannabis use and misuse. Previously established interventions (i.e., CANDIS; Hoch et al., 2017) were used to inform the core tenets of this brief intervention and included assessment feedback, psychoeducation about the biopsychosocial model of cannabis use, exploration of reasons for and against use, and goal setting. The emphasis placed on harm-reduction provides a manualized alternative to abstinence-based interventions. The need for such harm-reduction alternatives was illustrated in the present work, as abstinence had the lowest endorsement rate for desired goals by participants in the study. A complementary HSM manual, adapted from a web-based intervention (Riggs et al., 2018), was also developed for use as a comparison condition (Appendix P). This served as an alternative to a delayed treatment control and allowed for more critical examination of the treatment condition. Specifically, the consistent application of MI style and CBT across conditions allowed for consideration of the influence of common factors in treatment outcomes.

The second aim of this study was to establish, conduct, and evaluate a multimethod training paradigm for therapists seeking to administer manualized treatments. Training methods

were informed by training protocols used in the current treatment literature and included didactic training, manual review, and role play practice (Gates et al., 2016). In addition to the method of training, a fidelity checklist was also developed to standardize the evaluation of therapist adherence to study protocols. Evidence from the current study suggests that the combination of the identified training methods resulted in consistently high protocol adherence rates from therapists who completed all stages of training. Comparison of treatment fidelity between role plays and participant interventions showed a trend toward higher fidelity in participant interventions than what was seen for role plays. These findings suggest that, although therapists generally performed well on their first administration of either condition, fidelity was markedly higher after having gained experience with delivering session content in a simulated treatment environment. This finding is especially important given the single-session nature of the intervention, that all session content was delivered accurately in nearly all cases and for both conditions.

Findings did not support the CST intervention as being more efficacious than the HSM condition for the intended goal of reducing cannabis-related problems. Several possible explanations exist for the lack of an observed treatment effect on reduction in cannabis-related problems. Perhaps most prominently among such explanations are the relatively small and inconsistent direction of changes in CPQ scores for most participants, especially those assigned to the CST condition. This may be partially attributable to CST manual content, specifically the absence of identified strategies for reducing cannabis use and related problems (e.g., protective behavioral strategies). Another possible contributor is that the 4-week interval between baseline and follow-up assessments did not provide enough time for changes to cannabis-related problems to become salient. Assessment intervals for treatment effects in similar studies provided notably

longer periods such as 3- and 6-month (Hoch et al., 2014) and 4-, 7-, 13-, and 16-month follow-ups (Copeland et al., 2001). Therefore, a longer assessment interval may be necessary for participants to experience reductions in problems. Lastly, the majority of the analytical sample indicated no interest in changing their cannabis use. In other similar studies, participants were required to express motivation to either quit or reduce cannabis use to be eligible for participation (Copeland et al., 2001; Hoch et al., 2014). Therefore, it may be the case that interventions such as the one conducted in the present research are more appropriately suited for individuals who experience a higher number of problems and are intrinsically motivated for change.

Despite the lack of treatment effect for problem reduction, clinical significance was found for several other variables of interest. Self-reported distress from cannabis-related problems and SDS scores showed an identical pattern, that two participants made clinically meaningful reductions and one had a similarly meaningful increase on each measure. No consistency was seen for direction of changes made across study condition or ID. However, reported scores for both distress and the SDS were generally low, which is a likely indication that the level of treatment was not suitable to the needs for many participants.

The outcome of goal attainment presented mixed findings. Although average ratings suggested similarity across conditions, other measures of central tendency showed slightly better success in achieving goals for those who received the CST intervention. In fact, goal attainment was generally high for individuals under one or more of the following conditions: 1) received the CST intervention, 2) expressed interest in change, or 3) developed a personalized goal. The most notable contrast was for participants not interested in change showing a trend toward higher goal

attainment in the CST condition. This may be attributable to the goal setting exercise conducted exclusively in the CST intervention, but additional data is required to make a causal inference.

Another notable finding was the frequency of goal types endorsed by participants. Results indicated that, although abstinence was the least desired outcome, reduction in use was the most frequently endorsed and closely followed by reduction in cannabis-related problems. This finding highlights the need for more widely available harm-reduction approaches to treatment of cannabis use. Moreover, this finding also coincides with previous research which identifies not wanting to quit as a common barrier to treatment (No et al., 2004; Gates et al., 2012).

Finally, changes in use frequency showed slight differences between conditions, with all CST participants reporting reductions in number of use periods. On the other hand, changes in use for HSM participants showed increased use for several individuals. The findings for number of using days closely replicated this pattern. This may be an indication of a potential treatment effect on cannabis use, however many HSM participants also showed reductions in use of greater magnitude. As such, these findings should be interpreted with caution.

### **Deliverables and Clinical Importance**

The present study offers several key deliverables which, upon dissemination, may be of benefit to practicing clinicians. First, it established a method for training therapists which yielded near-perfect protocol adherence for sessions conducted with participants. The training presentation, included in Appendix L, provides a template for development of training presentations which incorporates a review of relevant style and modality of treatment into the specific content included in the session protocol. Moreover, the specific style and modality used

in this training presentation (i.e., MI and CBT) are based on current best practices within the field of substance use treatment.

Second, the fidelity checklists designed for each condition of the study provide a formalized method for evaluation of protocol adherence that can be easily replicated in style and format for other manualized interventions. An important feature of these checklists is the monitoring for content to be discussed in the session as well as content *not* to be discussed (i.e., cross-contamination). The similar requirement that a rater monitors for stylistic errors, such as giving advice without first asking permission in MI style, allows scoring of protocol adherence on *how* session content is delivered rather than merely *what* content was delivered.

Finally, the CST and HSM manuals are two newly developed resources for clinicians looking to support individuals in need of treatment for cannabis use and stress management, respectively. The unique contributions of each are reviewed in turn. As previously discussed, content for the CST manual was chosen based on current best practices in the field of treatment for cannabis use. The brief nature of this intervention offers practicing clinicians a structured way to supplement ongoing work with clients who have co-occurring cannabis use disorder or when otherwise clinically indicated. Importantly, multiple profiles for client presentation are included at various stages of the intervention, complete with guidance for the clinician and sample scripts consistent with MI style. The development of this manual addresses a known barrier to treatment of cannabis use and related problems by employing a harm-reduction approach without an expected goal of long-term abstinence. Similar to the CST manual, the HSM manual offers another supplemental, brief intervention for clinicians. Although its primary purpose in the current work was to serve as the control condition, it can be used to conduct a standalone session to assist clients who are struggling to effectively cope with stress.

## **Limitations and Future Directions**

There are many limitations affecting the different aims of the present work. First, the therapist training protocol, albeit seemingly effective, is time and labor intensive when including didactic training, manual review, and role play practice. The requisite amount of work required of therapists before conducting sessions with study participants feeds into a high rate of therapist attrition, such as what was observed in the present work (Figure 2). To increase therapist retention in future studies, researchers may consider incorporating role play practice into the didactic training, thereby increasing therapist comfort and familiarity with the content of the manual(s).

Another limitation of this study lies with the manualized approach toward treatment. The requirement of therapists to adhere to a study protocol reduces their ability to address complex and dynamic needs. This may restrict the appropriateness of the intervention to individuals who have uncomplicated concerns with cannabis, as other potentially co-occurring mental health needs are outside the scope of the treatment protocol. Future research may address this limitation by implementing a thorough screening process to detect and refer such individuals to the appropriate level of care. This may also be addressed by modifying the content within the treatment protocol to treat common co-occurring disorders or to include tangible strategies (e.g., PBS) for cannabis use and related problems that can be refined on an individual basis.

Several limitations related to participant recruitment and outcomes were also seen. Foremost, the recruitment of participants for the present study proved to be sporadic and had high rates of attrition from baseline to follow-up. Attrition was magnified for the CST condition, which had fewer than half the respondents at follow-up than the HSM condition. This differential response rate constrained the interpretability and generalizability of participant outcomes. At the

outset of the study, recruitment efforts were primarily directed toward people in the community (i.e., non-undergraduate research participants). This initial recruitment was also limited to treatment-seekers (i.e., interested in making changes to cannabis use), which was modeled after similar intervention study recruitment efforts (Copeland et al., 2001; Hoch et al., 2014). Required steps prior to participation included completion of an online screening survey, email exchange with the study coordinator, and assignment to a study therapist. This multi-step process likely deterred many from participating, especially those with waning interest. This was exacerbated by the limited accessibility of the research space on a university campus and availability of study therapists. Collectively, these factors presented multiple time points where eligible persons could withdraw prior to participation as well as presented challenges for in-person attendance. Future studies can look to current literature about barriers and facilitators of treatment to address these difficulties. As noted previously, stigma has been identified as a consistent barrier (Gates et al., 2012; Gates & Copeland, 2017), while streamlined admission is a known facilitator for people interested in treatment for cannabis (Gates et al., 2012). Restricting recruitment to treatment seekers may provide a more accurate indication of the potential benefits of this treatment approach, as individuals not interested in treatment may not be an appropriate target population for such brief (i.e., single session) interventions. Additionally, the teleconferencing capabilities currently available to clinicians offer a method of connecting individuals to treatment resources while substantially reducing the likelihood that a person may experience stigma associated with seeking treatment. Engagement can be further facilitated by implementing a streamlined approach where individuals can determine their eligibility, select an available time for participation, and receive all necessary information about study location at one time should be implemented in future research.



Another limitation related to participant attrition is the single-session design of this intervention. Although therapists in the present study demonstrated strict adherence to treatment protocols, this approach does not provide therapists with an opportunity to address inaccurate or omitted content from an initial session with participants. Consequently, participant outcomes are likely to be negatively affected for instances where therapists deviate from treatment protocol. Future work on this or similar interventions should consider sustained communication with participants between time points to increase response rates at follow-up. This would also facilitate an opportunity to address issues related to treatment fidelity, ensuring participants receive all components of the intervention.

## **Conclusions**

Findings from this study support a multi-method approach for training and evaluation of therapists seeking to administer manualized interventions. When training therapists to deliver a manualized treatment, especially in the context of a randomized clinical trial, the combination of manual review, didactic training, and role play practice appears to result in consistently high intervention protocol adherence as measured by a fidelity checklist. The materials developed for this study provide a framework for researchers to standardize training and fidelity checking of therapist delivery of intervention content. Together, these materials address the substantial variability seen in therapist training across cannabis treatment studies (Gates et al., 2016). If adopted by intervention researchers, the standardized training paradigm offered herein may lead to increased accuracy in the delivery of manualized content. The added use of a treatment fidelity checklist, and reporting of therapist adherence to that checklist, would likely allow for greater confidence in inferences drawn from study outcomes. Future research should explore the

uniqueness and magnitude of contributions for each training component, as they have yet to be determined.

Finally, this study also illustrates the need for easily accessible harm-reduction alternatives to the historic focus on abstinence in cannabis treatment. The identification of abstinence as a barrier to treatment in prior research (No et al., 2004; Gates et al., 2012) was supported in the present findings, as it was the least endorsed goal for use. The training materials and cannabis-specific manual developed for this study serve as an outline for how clinicians may be trained on and accurately implement evidence-based practices for cannabis treatment in a manner consistent with harm-reduction. Although a treatment effect was not detected in the present findings, it may be the case that such interventions are appropriate only for treatment-seeking cannabis users. Consequently, further research on development and implementation of this or similar brief interventions should prioritize accessibility of services to improve rates of participant recruitment and retention.

## TABLES

Table 1

*Examination of potential therapist effects*

	Training Level	MACP		PhD	
	Therapist	A	B	C	D
	Number of Participant Interventions	9	12	2	3
Study Condition	CST	5	6	1	1
	HSM	4	6	1	2
Attrition	Retained	8	5	1	2
	Dropped	1	7	1	1
Recruitment Source	Research Pool	4	11	2	3
	Community	5	1	0	0
Setting	In-person	9	5	0	0
	Zoom	0	7	2	3

Note: MACP = Masters in Addiction Counseling of Psychology, CST = Cannabis Specific Treatment, HSM = Healthy Stress Management. Study therapists are distinguished by the letters A, B, C, D and grouped according to level of training prior to involvement in the study. Numbers represent how many participants fit each category for each therapist.

Table 2

*Demographic information for the baseline sample grouped by study condition*

Cannabis Specific Treatment (n = 13)				Healthy Stress Management (n = 13)			
Variable	Mean	SD	Range	Variable	Mean	SD	Range
Age	20.23	1.83	18-24	Age	24.38	8.06	18-43
Sex	Selection	Percent	n	Percent	n		
	Female	54%	7	54%	7		
	Male	46%	6	46%	6		
Race	White only	69%	9	92%	12		
	Hispanic/Latinx and White	15%	2	8%	1		
	Tunisian and White	8%	1				
	AI/AN, Hispanic/Latinx, Middle Eastern, and White	8%	1				
Student	Yes	92%	12	85%	11		
	No	8%	1	15%	2		
Research Pool	Yes	77%	10	77%	10		
	No	23%	3	23%	3		
Setting	In-person	54%	7	54%	7		
	Zoom	46%	6	46%	6		

Note: Total baseline sample consisted of 26 participants that were randomly distributed across study conditions. Baseline sample size for each condition was 13.

Table 3

*Demographic information for the analytical sample grouped by study condition*

Cannabis Specific Treatment (n = 5)				Healthy Stress Management (n = 11)		
Variable	Mean	SD	Range	Mean	SD	Range
Age	20.40	1.52	18-22	23.64	7.71	18-43
Sex	Selection	Percent	n	Percent	n	
	Female	80%	4	55%	6	
	Male	20%	1	45%	5	
Race	White only	80%	4	91%	10	
	Hispanic/Latinx and White			9%	1	
	Tunisian and White	8%	1			
Student	Yes	100%	5	91%	10	
	No	0%	0	9%	1	
Research Pool	Yes	60%	3	85%	9	
	No	40%	2	15%	2	
Setting	In-person	100%	5	64%	7	
	Zoom	0%	0	36%	4	

Table 4

*Comparison of treatment fidelity for all therapists for role plays and study participants*

		Role Plays			Participant Interventions		
		<i>n</i>	Time (in minutes)	Fidelity Percentage	<i>n</i>	Time (in minutes)	Fidelity Percentage
CST	Minimum:		31	88%		37	94%
	Maximum:	7	77	100%	4	81	100%
	Average:		56	98%		54	98%
HSM	Minimum:		20	94%		19	100%
	Maximum:	7	54	100%	4	65	100%
	Average:		38	98%		41	100%

Note: CST = Cannabis Specific Treatment, HSM = Healthy Stress Management. All times are listed in minutes.

Table 5

*Descriptive statistics for sum-scored variables*

Variable	n	Mean	Std. Dev.	Skew	Kurtosis
T1 CPQ Total	16	7.00	3.31	-0.18	-1.05
T2 CPQ Total		6.50	3.92	0.16	-1.48
T1 CPQ Acute	16	2.94	1.53	-0.52	-0.77
T2 CPQ Acute		2.81	1.60	0.35	-0.84
T1 CPQ Psych	16	2.44	1.93	0.11	-1.04
T2 CPQ Psych		2.00	1.97	0.66	-0.68
T1 CPQ Social	16	1.63	1.20	0.32	-0.66
T2 CPQ Social		1.69	1.20	0.16	-0.65
T1 SDS Total	16	3.88	2.36	-0.14	-1.55
T2 SDS Total		3.44	2.61	0.58	-0.94

Note: T1 = Time 1 or Baseline scores. T2 = Time 2 or Follow-up scores. All variables are sum-scored. CPQ Acute = acute and physical consequences, CPQ Psych = psychological consequences, CPQ Social = social consequences.

Table 6

*Cannabis-related problems 2X2 ANCOVA*

Variable	df	F	p	$\eta$
Time 1 Probs	1	19.295	.001	.617
Sex	1	.749	.404	.059
Treatment Condition	1	.042	.841	.004



Table 7

*CPQ changes for the analytical sample*

Condition	Study ID	T1 CPQ	T2 CPQ	Change Score
CST	1000	9	10	+1
	1001	5	3	-2
	1003	3	1	-2
	1005	7	6	-1
	1006	4	6	+2
HSM	2000	1	3	+2
	2001	12	12	0
	2002	3	2	-1
	2003	7	3	-4
	2004	9	12	+3
	2005	10	10	0
	2006	6	2	-4
	2007	9	12	+3
	2010	11	7	-4
	2011	5	6	+1
	2012	11	9	-2

Note: T1 = Time 1 or Baseline scores. T2 = Time 2 or Follow-up scores. Range of possible responses for the scale is 0-21.

Table 8

*Distress rating changes for the analytical sample*

Condition	Study ID	T1 Distress	T2 Distress	Change Score
CST	1000	8	7	-1
	1001	1	0	-1
	1003	1	0	-1
	<b>1005</b>	<b>1</b>	<b>6</b>	<b>+5</b>
	1006	2	2	0
HSM	2000	0	0	0
	2001	5	4	-1
	2002	4	3	-1
	2003	2	4	+2
	<b>2004</b>	<b>6</b>	<b>3</b>	<b>-3</b>
	<b>2005</b>	<b>3</b>	<b>0</b>	<b>-3</b>
	2006	1	1	0
	2007	2	1	-1
	2010	4	5	+1
	2011	0	0	0
	2012	3	4	+1

Note: T1 = Time 1 or Baseline scores. T2 = Time 2 or Follow-up scores. Bold indicates clinically significant change.

Table 9

*SDS changes for the analytical sample*

Condition	Study ID	T1 SDS	T2 SDS	Change Score
CST	1000	5	6	+1
	<b>1001</b>	<b>6</b>	<b>1</b>	<b>-5</b>
	1003	1	2	+1
	1005	3	3	0
	1006	2	1	-1
HSM	2000	6	3	-3
	2001	6	6	0
	2002	2	0	-2
	<b>2003</b>	<b>3</b>	<b>2</b>	<b>-1</b>
	2004	5	8	+3
	2005	7	4	-3
	2006	0	1	+1
	2007	6	6	0
	<b>2010</b>	<b>2</b>	<b>3</b>	<b>+1</b>
	2011	1	1	0
	2012	7	8	+1

Note: T1 = Time 1 or Baseline scores. T2 = Time 2 or Follow-up scores. Range of possible responses for the scale is 0-15. Bold indicates clinically significant change in meeting criteria for dependence.

Table 10

*Goal attainment for the analytical sample*

Condition	Study ID	Goal Type			
		Abstinence	Reduce Use	Reduce Problems	Personalized
CST	1000		3	2	
	1001				7
	1003		8		
	1005			6	
	1006			7	
HSM	2000				10
	2001		4	7	
	2002			5	
	2003		5		
	2004	4	4		
	2005		6		
	2006	-	-	-	-
	2007		3	3	
	2010	6			
	2011				9
	2012		3		
	Mean	Std. Dev.	Median	Mode	
CST	5.5	2.43	6.5	7	
HSM	5.3	2.25	5	4	

Note: Goal attainment was self-reported on a scale of 0 (not at all) to 10 (completely successful). Personalized goals were self-stated goals that were not represented by the other options.

Table 11

*Use changes for the analytical sample*

Condition	Study ID	Use Periods		
		Time 1	Time 2	Change Score
CST	1000	40	29	-11
	1001	38	27	-11
	1003	13	8	-5
	1005	18	9	-9
	1006	11	2	-9
HSM	2000	112	112	0
	2001	78	56	-22
	2002	32	22	-10
	2003	8	11	+3
	2004	48	7	-41
	2005	56	59	+3
	2006	11	12	+1
	2007	56	21	-35
	2010	38	16	-22
	2011	85	84	-1
	2012	66	15	-51
		Use Days		
		Time 1	Time 2	Change Score
CST	1000	28	28	0
	1001	28	17	-11
	1003	13	8	-5
	1005	18	9	-9
	1006	11	2	-9
HSM	2000	28	28	0
	2001	28	26	-2
	2002	16	16	0
	2003	8	9	+1
	2004	28	7	-21
	2005	28	27	-1
	2006	10	12	+2
	2007	28	7	-21
	2010	26	15	-11
	2011	28	28	0
	2012	28	7	-21

Note: CST = Cannabis Specific Treatment, HSM = Healthy Stress Management. T1 = Time 1 or Baseline scores. T2 = Time 2 or Follow-up scores. Total use periods possible at both time points were 112. Total using days possible at both time points were 28.

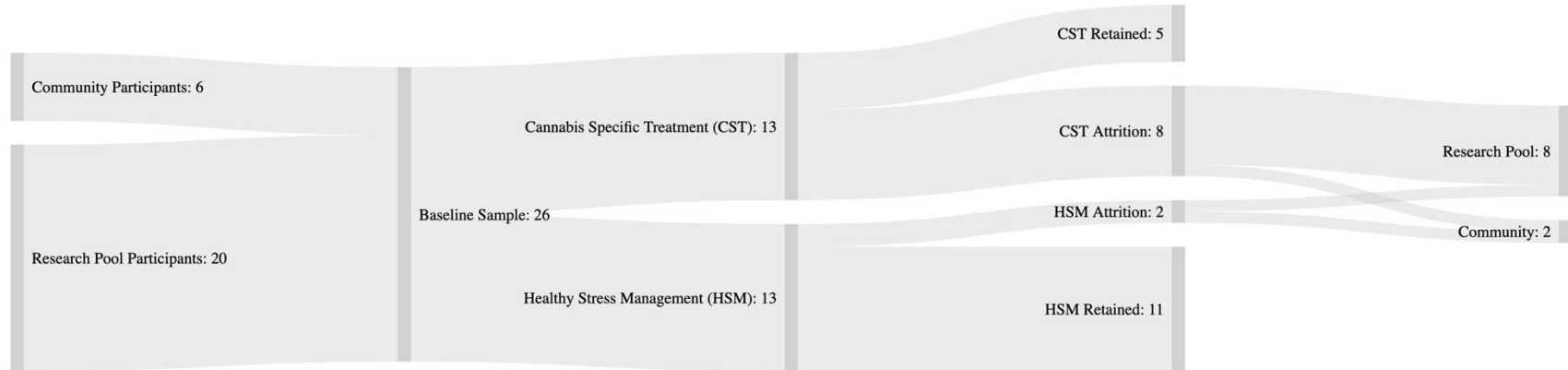


Figure 1: *Recruitment and attrition consort diagram*

Note: Values indicate the number of participants represented at each stage of recruitment, intervention, and attrition.



Figure 2: *Therapist training consort diagram*

Note: Numbers represent how many study therapists reached the associated stage of training.

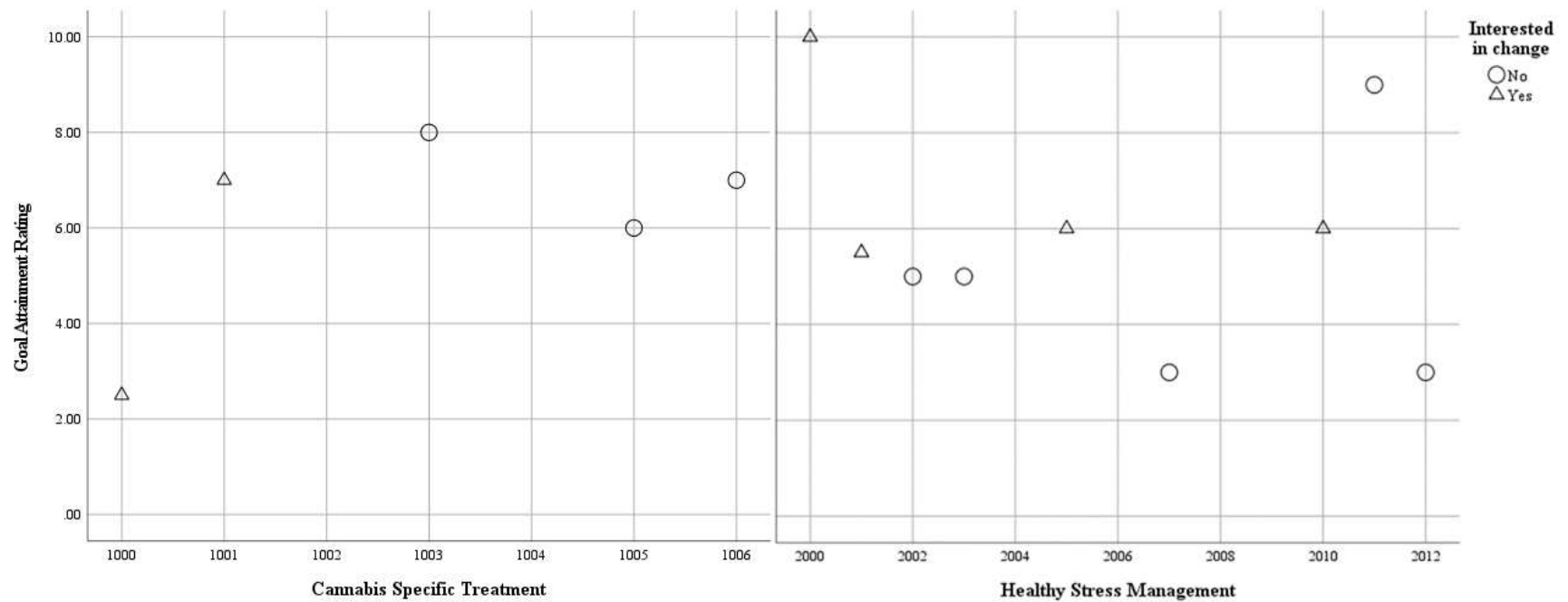


Figure 3: *Average goal attainment ratings for each participant at follow-up*

Note: Ratings were averaged for participants who endorsed multiple goals. Two participants were excluded due to missing data: ID 2004 did not indicate whether they were interested in change, ID 2006 did not endorse any goals. Goal attainment ratings for all endorsed goals are presented in Table 9.



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## APPENDIX A

### Demographics and Cannabis Use History

## Demographics and Cannabis Use History

### **Part 1: Demographic Information**

1. Age: \_\_\_\_\_ years old
2. Sex:    Female    Male
3. For females: Are you currently pregnant or planning to become pregnant?  
  
Yes    No
4. Which racial group best describes you?  
  
\_\_\_\_\_ White  
  
\_\_\_\_\_ Black or African American  
  
\_\_\_\_\_ Asian  
  
\_\_\_\_\_ Native American or Native Alaskan  
  
\_\_\_\_\_ Native Hawaiian or Pacific Islander  
  
\_\_\_\_\_ Other: \_\_\_\_\_
5. Do you consider yourself Hispanic or Latino/a?  
  
Yes    No
6. Are you a student?  
  
Yes    No
7. Are you currently taking any psychotropic medications (e.g., anti-depressants, anti-anxiety, etc.)?  
  
No  
  
Yes (please list): \_\_\_\_\_
8. Are you currently participating in another substance use treatment program?  
  
Yes    No

## **Part 2: Cannabis Use History**

1. How old were you when you first tried cannabis? \_\_\_\_\_ years old
2. How old were you when you began regularly using cannabis? \_\_\_\_\_ years old
3. Have you ever been in treatment for cannabis before?  
Yes    No
4. Have you ever been diagnosed with Cannabis Use Disorder?  
Yes    No
5. What is your preferred method for using cannabis?
  - ☐ Bong
  - ☐ Joint
  - ☐ Pipe
  - ☐ Gravity Bong or Bucket
  - ☐ Other: \_\_\_\_\_
6. What is your preferred way to use cannabis?
  - ☐ Flower
  - ☐ Concentrates (e.g., dabbing)
  - ☐ Edibles
  - ☐ Oils
  - ☐ Other: \_\_\_\_\_
7. Since you began regular use, what is the longest you have gone without cannabis?  
\_\_\_\_\_ days

8. In the past 30 days, how many days have you used cannabis?

\_\_\_\_\_ days (0-30)

9. How many hours per week are you typically under the influence of cannabis?

\_\_\_\_\_ hours/week (0-168)

10. How many days per week do you typically use cannabis?

\_\_\_\_\_ days/week (0-7)

11. How many weeks per month do you typically use cannabis?

\_\_\_\_\_ weeks/month (0-4)

12. On days when you use, how many hours are you under the influence of cannabis?

\_\_\_\_\_ hours/day (0-24)

13. On a normal week, how high do you typically get?

0 (not high at all) – 10 (extremely high)

M	T	W	Th	F	Sa	Su

14. How distressing are the problems you have experienced resulting from cannabis use?

(Little/No Distress)

(Extreme Distress)

0    1    2    3    4    5    6    7    8    9    10

15. For days when you use, please indicate the approximate percent of days using:

\_\_\_\_\_ % Flower

\_\_\_\_\_ % Concentrates

\_\_\_\_\_ % Edibles

\_\_\_\_\_ % Oils

\_\_\_\_\_ % Other: \_\_\_\_\_

16. What is/are your goal(s) for your use (select all that apply)?

- ☐ Abstinence from cannabis use
- ☐ Reduction in cannabis use
- ☐ Reduction in cannabis-related problems
- ☐ Other: \_\_\_\_\_

## APPENDIX B

### Timeline Followback

### Timeline Followback Sample

In the space provided, please describe your cannabis use over the past four weeks. If you did not use on a day/time, leave that space blank. If you did, list the type and amount used according to the legend. The amount used should be your best approximation. The example shows someone who did not use from 6am-12pm, had about half of a gram of flower from 12pm-6pm, 20 milligrams of edibles from 6pm-12am, and did not use from 12am-6am.

**Legend:** F = Flower, C = Concentrates, E = Edible, T = Topical, O = Other  
Estimate Flower and Concentrates in grams (g), Edibles and Topicals in milligrams (mg)

Example			
6am-12pm	12pm-6pm	6pm-12am	12am-6am
	F.5g	E20mg	

Sunday				Monday				Tuesday			
6am-12pm	12pm-6pm	6pm-12am	12am-6am	6am-12pm	12pm-6pm	6pm-12am	12am-6am	6am-12pm	12pm-6pm	6pm-12am	12am-6am

Wednesday				Thursday				Friday			
6am-12pm	12pm-6pm	6pm-12am	12am-6am	6am-12pm	12pm-6pm	6pm-12am	12am-6am	6am-12pm	12pm-6pm	6pm-12am	12am-6am

Saturday			
6am-12pm	12pm-6pm	6pm-12am	12am-6am



## APPENDIX C

### Severity of Dependence Scale

The following questions are about your attitudes about cannabis use over the past 3 months. Please select the option which most accurately describes you.

1. Did you ever think your use of cannabis was out of control?
  - ☐ Never or almost never
  - ☐ Sometimes
  - ☐ Often
  - ☐ Always or nearly always
2. Did the prospect of missing a smoke make you very anxious or worried?
  - ☐ Never or almost never
  - ☐ Sometimes
  - ☐ Often
  - ☐ Always or nearly always
3. Did you worry about your use of cannabis?
  - ☐ Not at all
  - ☐ A little
  - ☐ Quite a lot
  - ☐ A great deal
4. Did you wish you could stop?
  - ☐ Never or almost never
  - ☐ Sometimes
  - ☐ Often
  - ☐ Always or nearly always
5. How difficult would you find it to stop or go without?
  - ☐ Not difficult
  - ☐ Quite difficult
  - ☐ Very difficult
  - ☐ Impossible

## APPENDIX D

### Cannabis Problems Questionnaire

The following questions apply to your experiences from using cannabis over the past 3 months. Please answer all the questions by circling either YES or NO.

In the last 3 months:

- |  |     |    |
|--|-----|----|
| 1. <u>Have you tended to smoke more on your own than you used to?</u>                | Yes | No |
| 2. <u>Have you worried about meeting people you don't know when stoned?</u>          | Yes | No |
| 3. <u>Have you spent more time with smoking friends than other kinds of friends?</u> | Yes | No |
| 4. <u>Have your friends criticized you for smoking too much?</u>                     | Yes | No |
| 5. <u>Have you sold any of your belongings to buy cannabis?</u>                      | Yes | No |
| 6. <u>Do you find yourself making excuses about money?</u>                           | Yes | No |
| 7. <u>Have you been in trouble with the police due to your smoking?</u>              | Yes | No |
| 8. <u>Have you been physically sick after smoking?</u>                               | Yes | No |
| 9. <u>Have you passed out after a smoking session?</u>                               | Yes | No |
| 10. <u>Have you had pains in your chest or lungs after a smoking session?</u>        | Yes | No |
| 11. <u>Have you been neglecting yourself physically?</u>                             | Yes | No |
| 12. <u>Have you failed to wash for several days at a time?</u>                       | Yes | No |
| 13. <u>Have you felt depressed for more than a week?</u>                             | Yes | No |
| 14. <u>Have you been so depressed you felt like doing away with yourself?</u>        | Yes | No |
| 15. <u>Have you given up recreational activities you once enjoyed for smoking?</u>   | Yes | No |
| 16. <u>Do you find it hard to get the same enjoyment from your usual interests?</u>  | Yes | No |
| 17. <u>Has your general health been poorer than usual?</u>                           | Yes | No |
| 18. <u>Have you felt more antisocial after smoking?</u>                              | Yes | No |
| 19. <u>Have you been concerned about a lack of motivation?</u>                       | Yes | No |
| 20. <u>Have you worried about feelings of personal isolation or detachment?</u>      | Yes | No |
| 21. <u>Do you usually have a smoke in the morning, to get yourself going?</u>        | Yes | No |

## APPENDIX E

### Perceived Stress Scale

The questions in this scale ask you about your feelings and thoughts during the last month. In each case, you will be asked to indicate *how often* you felt or thought a certain way.

0 = Never    1 = Almost Never    2 = Sometimes    3 = Fairly Often    4 = Very Often

1. In the last month, how often have you been upset because of something that happened unexpectedly?  
0      1      2      3      4
2. In the last month, how often have you felt that you were unable to control the important things in your life?  
0      1      2      3      4
3. In the last month, how often have you felt nervous and "stressed"?  
0      1      2      3      4
4. In the last month, how often have you felt confident about your ability to handle your personal problems?  
0      1      2      3      4
5. In the last month, how often have you felt that things were going your way?  
0      1      2      3      4
6. In the last month, how often have you found that you could not cope with all the things that you had to do?  
0      1      2      3      4
7. In the last month, how often have you been able to control irritations in your life?  
0      1      2      3      4
8. In the last month, how often have you felt that you were on top of things?  
0      1      2      3      4
9. In the last month, how often have you been angered because of things that were outside of your control?  
0      1      2      3      4
10. In the last month, how often have you felt difficulties were piling up so high that you could not overcome them?  
0      1      2      3      4

## APPENDIX F

### Assessment Feedback

### **Personalized Feedback for ID#:**

#### **Your Cannabis Use:**

# of using days within the past 30: \_\_\_\_\_ days

For a normal week, how high you typically get:

0 (not high at all) – 10 (extremely high)

M	T	W	Th	F	Sa	Su

How distressing are the problems you have experienced resulting from cannabis use?

(Little/No Distress)

(Extreme Distress)

0      1      2      3      4      5      6      7      8      9      10

#### **Severity of Dependence Scale**

Your Score: \_\_\_\_/15

Average pre-treatment score: 9/15

\*A score of 3 or more indicates cannabis dependence in adults.

#### **Cannabis Problems Questionnaire**

Your Overall Score: \_\_\_\_/21

- Physical: \_\_\_\_/4
- Psychological: \_\_\_\_/7
- Social: \_\_\_\_/10

CPQ measures problems on three dimensions:

- Physical (4 questions)
- Psychological (7 questions)
- Social (10 questions)

Average pre-treatment scores:

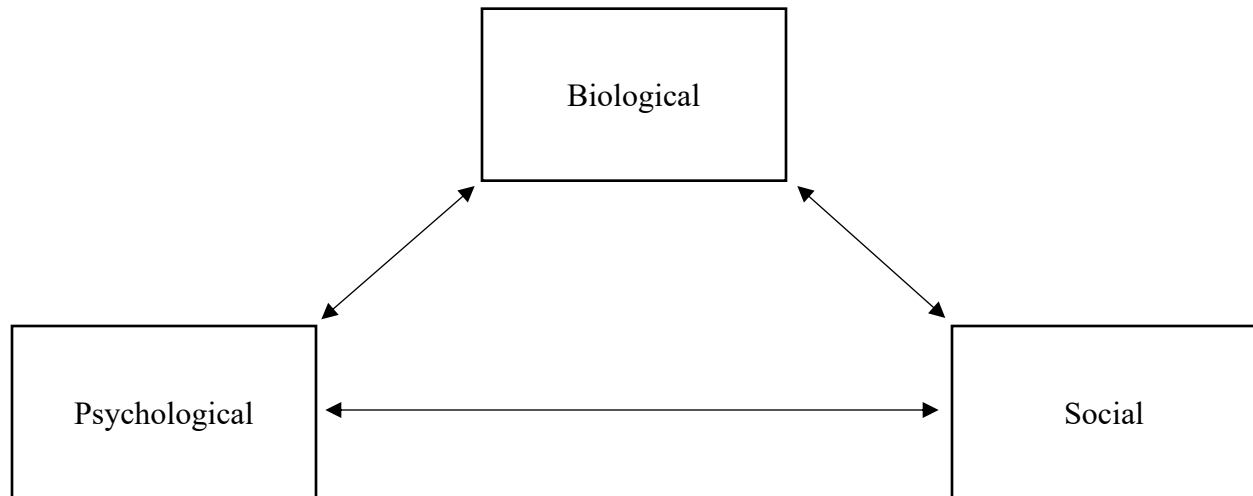
- Overall: 6.7
- Physical: 2.6
- Psychological: 2.0
- Social: 1.7



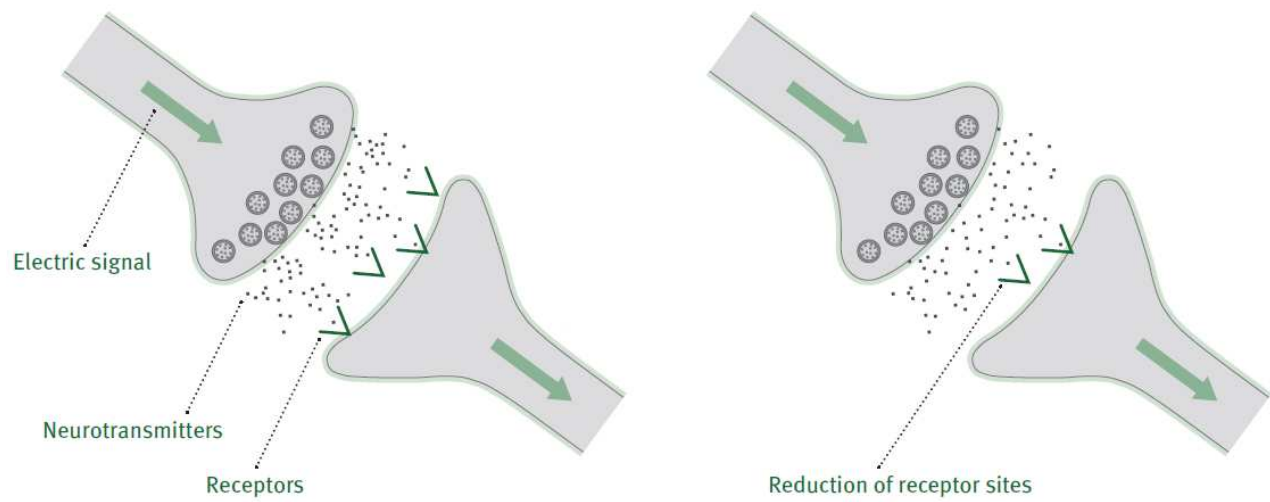
## APPENDIX G

### Biopsychosocial Model Diagram

## The Biopsychosocial Model



## Tolerance and Dependence



## Biological

- How cannabis impacts the brain
  - Neurotransmitters – chemicals produced by the body that allow cells to communicate
  - Synapses – connections between neurons in the brain that
  - THC mimics the body's naturally produced neurotransmitter called anandamide, and fills the synapses in far greater amounts than the body could naturally produce
- Tolerance
  - Receptor down-regulation – Repeated use of cannabis “floods” the synapse in the brain with extra neurotransmitters
- Dependence
  - When you have used cannabis often enough, the body relies on it to feel “normal”
- Withdrawal
  - Common symptoms: irritability, anxiety, cravings, sleep disruption, anger/aggression, depressed mood, restlessness, decreased appetite, and weight loss
  - Symptoms typically start within 48 hours of quitting and usually subside after 7 to 10 days.

## Psychological

- Classical Conditioning
  - Pavlov's dog
- Expectations for use
  - Positive and negative
  - Using for enhancement vs withdrawal relief

## Social

- Cannabis use network
  - Similarities between self and other's use
  - Differences between self and other's use
- What would ideal cannabis use be?

## APPENDIX H

### Decisional Balance Scale

Below are a list of pros and cons of cannabis use. Please rate each item on a scale of 0 (does not describe my use) to 10 (perfectly describes my use). Blanks are provided if there are any other pros and/or cons that apply to you.

Pros	Rating	Cons	Rating
I would feel happy when I'm high.		It's illegal, and I could get caught.	
It would relieve stress, anxiety, or worry.		It's not accepted or approved of by people who are important to me.	
It could create opportunities for social activities (e.g., meeting new people, bonding, or spending time with friends).		It could impair my performance in my daily activities	
Everyday activities would be more enjoyable (e.g., watching TV or movies, listening to music, playing video games).		It could reduce my ability to pay attention or remember things.	
It is something fun and exciting to do, especially if I'm bored.		It could make me feel bad physically (e.g., dry mouth, red eyes, racing heart).	
it would make me more relaxed or calm.		It could have unpleasant psychological effects (e.g., mood swings, depression, paranoia).	
It would help me sleep.		It could contain other drugs.	
It would make things funnier.		It could impair my reaction time, vision, or perception.	
		It could serve as a "gateway drug" leading to more dangerous drug use.	
		It could lead to dependency or addiction.	
		It may cause me to be a bad influence on others.	
		It could make me feel "burnt out" or less energetic.	
		It could damage my current relationships.	
		It could cause me to make the wrong type of friends.	
		It could give me a bad image (e.g., labeled as a "pothead").	
		It could impair my judgment, which may endanger myself or others.	

## APPENDIX I

### Change Plan

## Change Plan

My goal(s): \_\_\_\_\_

Reasons to change:

1. \_\_\_\_\_

2. \_\_\_\_\_

3. \_\_\_\_\_

Strategies to help me reach my goal(s):

1. \_\_\_\_\_

\_\_\_\_\_

2. \_\_\_\_\_

\_\_\_\_\_

3. \_\_\_\_\_

\_\_\_\_\_

Rewards for reaching my goal(s):

1. \_\_\_\_\_

2. \_\_\_\_\_

3. \_\_\_\_\_

Target day: \_\_\_\_\_

## APPENDIX J

### Treatment Fidelity Checklist



## **Fidelity Checklist** **Cannabis Specific Treatment**

### *Assessment Feedback*

- |  |   |
|--|---|
|  | 1. Discussed how SDS scores align with other cannabis users |
|  | 2. Discussed how CPQ scores align with other cannabis users |
|  | 3. Discussed how SDS and CPQ scores interact                |

### *Biopsychosocial Model*

#### **Biological**

- |  |   |
|--|---|
|  | 1. Discussed synapses, neurotransmitters, and endo/exogenous cannabinoids |
|  | 2. Discussed receptor down-regulation (i.e., tolerance) and dependence    |
|  | 3. Discussed withdrawal symptom onset and duration                        |

#### **Psychological**

- |  |   |
|--|---|
|  | 1. Discussed classical conditioning       |
|  | 2. Discussed learned expectations for use |

#### **Social**

- |  |  |
|--|--|
|  | 1. Discussed similarities between participant and cannabis-using friends |
|  | 2. Discussed differences between participant and cannabis-using friends  |
|  | 3. Discussed what "ideal" cannabis use would be                          |

### *Reasons for Change and Sustainment*

- |  |   |
|--|---|
|  | 1. Reviewed salient reasons for change      |
|  | 2. Reviewed salient reasons for sustainment |

### *Goal Setting*

- |  |   |
|--|---|
|  | 1. Discussed SMART goals  |
|  | 2. Created a list of reasons for change                             |
|  | 3. Discussed at least one strategy for success                      |
|  | 4. Established a target date  |
|  | 5. Assessed participant confidence in ability to meet his/her goals |

- |  |                        |
|--|------------------------|
|  | Points Deducted/Missed |
|  | Subtotal               |

- |  |  |
|--|--|
|  | MI inconsistencies (0 if none, -1 if any)  |
|  | Cross-contamination (0 if none, -1 if any) |

- |  |               |
|--|---------------|
|  | Total points  |
|  | Total percent |

**Fidelity Checklist**  
**Healthy Stress Management**

*Levels of Stress*

<input type="checkbox"/>	1. Characterized low stress as healthy
<input type="checkbox"/>	2. Solicited participant for examples of low stress in their life/experience
<input type="checkbox"/>	3. Reviewed positive moderate stress
<input type="checkbox"/>	4. Reviewed negative moderate stress
<input type="checkbox"/>	5. Characterized high stress as unhealthy
<input type="checkbox"/>	6. Provided participant with examples of possible consequences of high stress

*The "Four A's"*

<input type="checkbox"/>	1. "Avoid": Introduced and solicited participant examples of avoiding stress
<input type="checkbox"/>	2. "Avoid": Discussed at least one of the Mayo Clinic's stress avoidance strategies
<input type="checkbox"/>	3. "Alter": Introduced and solicited participant examples of altering stress
<input type="checkbox"/>	4. "Alter": Discussed at least one of the Mayo Clinic's stress altering strategies
<input type="checkbox"/>	5. "Accept": Introduced and solicited participant examples of accepting stress
<input type="checkbox"/>	6. "Accept": Discussed at least one of the Mayo Clinic's stress acceptance strategies
<input type="checkbox"/>	7. "Adapt": Introduced and solicited participant examples of adapting to stress
<input type="checkbox"/>	8. "Adapt": Discussed at least one of the Mayo Clinic's stress adaptation strategies

*Coping Strategies*

<input type="checkbox"/>	1. Discussed at least one coping strategy with participant
<input type="checkbox"/>	2. Related session content to at least one of the participant's chosen coping strategies

<input type="checkbox"/>	Points Deducted/Missed
<input type="checkbox"/>	Subtotal

<input type="checkbox"/>	MI inconsistencies (0 if none, -1 if any)
<input type="checkbox"/>	Cross-contamination (0 if none, -1 if any)

<input type="checkbox"/>	Total points
<input type="checkbox"/>	Total percent

## APPENDIX K

### Referral Form

**CAMPUS REFERRALS**  
**IN CASE OF EMERGENCY CALL 911**

**Health Network Counseling**

CSU Health and Medical Center  
Third Floor  
151 West Lake Street  
Fort Collins, CO 80523-8031  
Phone: (970) 491-6053  
Fax: (970) 491-2382  
Drugs, Alcohol, and You (DAY) Program: (970) 491-4693

**Psychological Services Center**

Sage Hall  
Fort Collins, CO 80524  
Phone: (970) 491-5212  
Fax: (970) 491-3380  
Email: [psych\\_psc@mail.colostate.edu](mailto:psych_psc@mail.colostate.edu)

## APPENDIX L

### Training Presentation



# Interventionist Training

Ted Fetterling, B.S.

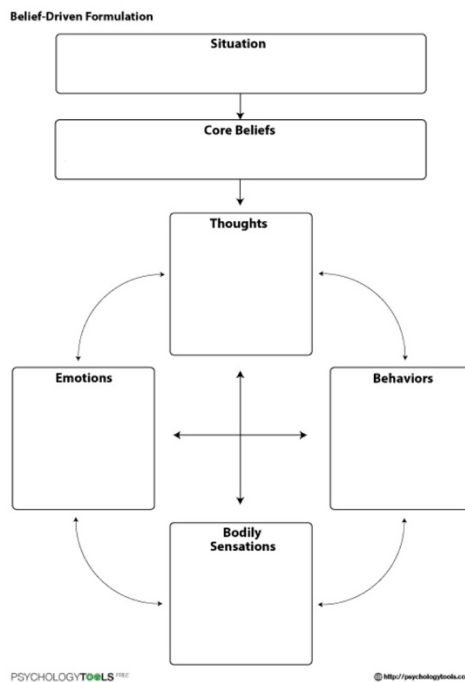
## Overview

- ▶ Intervention Purpose
- ▶ MI & CBT Review
- ▶ Treatment Manual Familiarization and Fidelity
- ▶ Special Cases
- ▶ Lab Computer
- ▶ Survey Familiarization
- ▶ Data Handling Protocol
- ▶ Housekeeping

## Intervention Purpose

- ▶ A brief, harm reduction intervention for cannabis-related *problems*.
- ▶ Abstinence vs Harm Reduction
  - ▶ Flexibility in treatment outcomes

## Cognitive Behavioral Therapy



## Motivational Interviewing

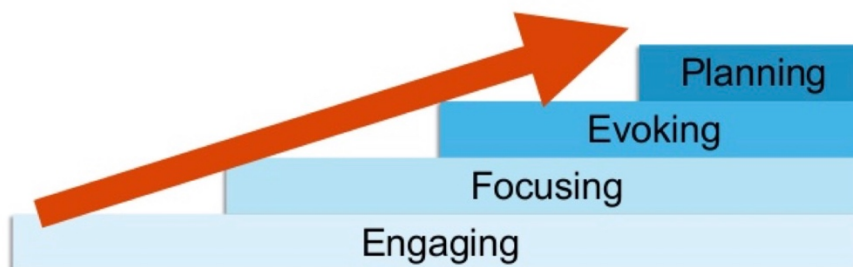
### ► The Spirit of MI:

- Acceptance
- Collaboration
- Compassion
- Evocation

## Motivational Interviewing

### Guiding the process of change

---



Miller WR, Rollnick S. Motivational Interviewing. New York: Guilford Press; 2013.



## Motivational Interviewing

### 1. Engaging

- a) Open-ended Questions
- b) Affirmations
- c) Reflections
- d) Summaries

## Motivational Interviewing

### 1. Focusing

- a) Client
- b) Setting
- c) Clinical Expertise

## Motivational Interviewing

### 3. Evoking

- a) Change Talk
- b) Sustain Talk



## Motivational Interviewing

- Planning
  - Collaboration
  - Commitment
  - Specificity



## Motivational Enhancement Therapy

- ▶ Structured version of MI
- ▶ Style versus Modality
- ▶ Assessment feedback
- ▶ Increased treatment efficacy

## Treatment Manual Familiarization

- ▶ Personalized manuals
- ▶ Supplementary materials
  - ▶ What goes home with the participant
- ▶ Manuals need to be available for you to refer to in session
- ▶ Fidelity Checklist
  - ▶ Cross contamination
  - ▶ MI Style
  - ▶ Remediation plan

## Treatment Condition



Assessment Feedback



Biopsychosocial Model



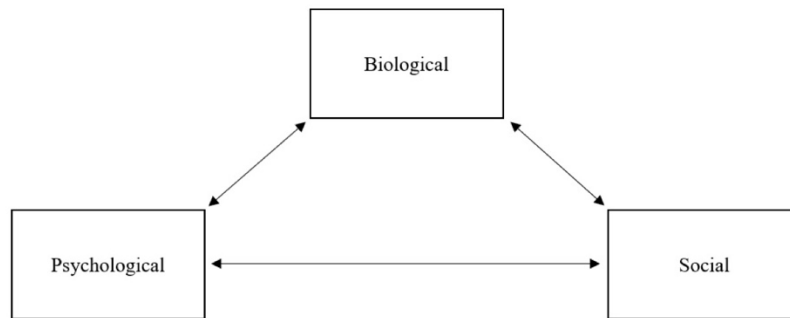
Decisional Balance



Change Plan

## Assessment Feedback

- ▶ Number of days during heaviest use
- ▶ For a normal week, how high you typically get: Mon - Sun
- ▶ How distressing are the problems experienced?
- ▶ Severity of Dependence Scale (SDS)
- ▶ Cannabis Problems Questionnaire (CPQ)

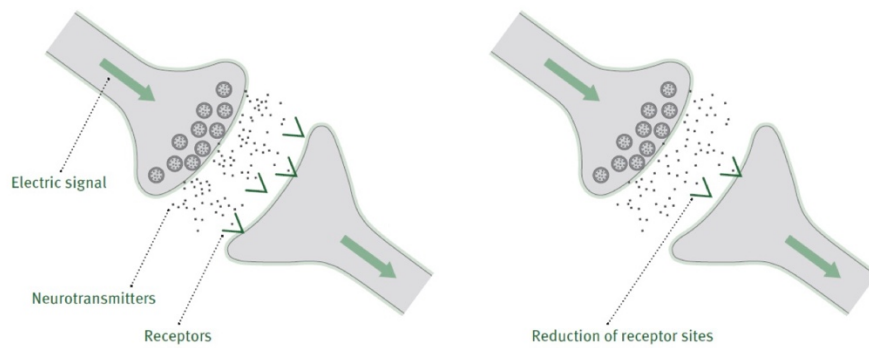


## Biopsychosocial Model

### Biopsychosocial Model

- ▶ **Biological**
  - ▶ Anandamide and THC
  - ▶ Tolerance
    - ▶ Gradual reduction in available receptor sites
  - ▶ Dependence
    - ▶ The physical “need” for an exogenous substance because the body is not producing the endogenous neurotransmitter anandamide
- ▶ **Withdrawal**
  - ▶ Physical and psychological symptoms resulting from reduction or abstinence from a substance (i.e., alcohol, cannabis, etc.)

## Biopsychosocial Model



## Biopsychosocial Model

- ▶ Psychological
  - ▶ Classical conditioning
  - ▶ Expectancies
    - ▶ Positive
      - ▶ “Things will be funnier.”
    - ▶ Negative
      - ▶ “I’ll be paranoid.”

## Biopsychosocial Model

### ► Social

- Stigma
  - Drug use & treatment
- Friends and family
- Pluralistic ignorance
  - The majority of group members personally reject a norm, but falsely believe that most other people find that same behavior acceptable.

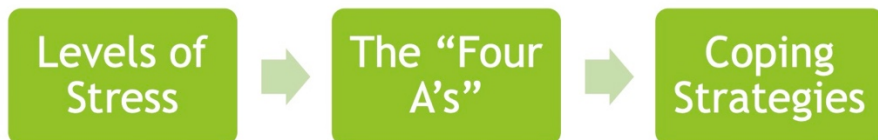
## Decisional Balance

- Scale consists of:
  - 8 pros
  - 16 cons
- Space added for personalized responses
- Emphasis on eliciting change talk

## Change Plan

- ▶ Goal setting exercise
- ▶ SMART goal framework
- ▶ Must include:
  - ▶ At least one goal
  - ▶ Reasons for change
  - ▶ Strategies for success
  - ▶ Target date
  - ▶ Evaluation of participant's confidence/ability to meet stated goal(s)

## Control Condition





## Special Cases

- ▶ Clients who:
  - ▶ Are upset about being placed in control condition
  - ▶ Do not want to be video/audio recorded
  - ▶ Express risk or need for referral
  - ▶ Intoxicated participants
    - ▶ Drunk
    - ▶ High

## Lab Computer

- ▶ Participant and Interventionist logins
- ▶ Recording equipment
- ▶ How to name recordings
  - ▶ Interventionist initials, condition, participant ID
    - ▶ Ex: AR Tx 1020

## Housekeeping

- ▶ Contact Information
  - ▶ (816) 509-5981
- ▶ To Do:
  - ▶ Practice delivering both conditions
  - ▶ CITI Certification
  - ▶ Jurisprudence
  - ▶ Qualifications (e.g., CACI-III, LAC)
  - ▶ Experience
    - ▶ Years
    - ▶ Location(s)

## Survey Familiarization

- ▶ Obtaining informed consent

## Data Handling Protocol

► [See Document](#)

Questions



## APPENDIX M

### Screening Survey

## Screening Survey

Welcome to the screening survey for a brief treatment for cannabis-related problems! This following questions should take 1-2 minutes to complete and will help determine your eligibility to participate in this study. If you have questions regarding participation, please email the study coordinator at: [Ted.Fetterling@colostate.edu](mailto:Ted.Fetterling@colostate.edu). Thank you!

---

Q1 Are you between 18-65 years old?

☐ Yes

☐ No

*Skip To: Q7 If Q1 = No*

---

Q2 Do you currently use cannabis in any form (e.g., flower, edibles, concentrates)?

☐ Yes

☐ No

*Skip To: Q7 If Q2 = No*

---

Q3 Are you interested in making any changes to your cannabis use?

☐ Yes

☐ No

---

Q4 Is cannabis the substance you are most concerned about?

☐ Yes

☐ No

---

Q5 Are you currently involved in a substance use treatment program?

☐ Yes

☐ No

---

Q6 Do you have any mental illness or cognitive impairments that would affect your ability to participate in a research study?

☐ Yes

☐ No

*Skip To: End of Survey If Q6 = No*

---

Q7 Thank you for your interest in this study! We regret to inform you that you do not meet the minimum criteria required for participation. Please refer to the resources listed below for alternative treatment providers:

CSU Health and Medical Center  
Third Floor  
151 West Lake Street  
Fort Collins, CO 80523-8031  
Phone: (970) 491-6053  
Fax: (970) 491-2382  
Drugs, Alcohol, and You (DAY) Program: (970) 491-4693

Sage Hall  
Fort Collins, CO 80524  
Phone: (970) 491-5212  
Fax: (970) 491-3380  
Email: [psych\\_psc@mail.colostate.edu](mailto:psych_psc@mail.colostate.edu)

Mountain Crest Behavioral Health: <https://www.uchealth.org/services/addiction-treatment/>

Aspen Ridge Recovery: <https://www.aspenridgefortcollins.com/>

## APPENDIX N

### Data Handling Protocol

## Data Handling Protocol

### 1. Survey Administration

- a. Open a web browser to the Qualtrics survey link (**DOES NOT WORK CORRECTLY WITH MICROSOFT EDGE**)
  - i. For undergraduate research pool participants:
    1. [http://colostate.az1.qualtrics.com/jfe/form/SV\\_6D0ilTZgxbQtyWp](http://colostate.az1.qualtrics.com/jfe/form/SV_6D0ilTZgxbQtyWp)
  - ii. For anyone else (i.e., not part of the undergraduate research pool):
    1. [https://colostate.az1.qualtrics.com/jfe/form/SV\\_1S8F5vIsbLsJIjP](https://colostate.az1.qualtrics.com/jfe/form/SV_1S8F5vIsbLsJIjP)
- b. Assign a participant ID number at the first screen of the baseline survey
  - i. Use the participant ID sheet (Excel Spreadsheet) to determine the appropriate number to assign
    1. The table on the right side of the page will tell you which condition the participant is being randomly assigned to (#1)
    2. The table on the left side tells you which participant ID number to use next for each condition (#2)
      - a. Highlight the number you used by filling the cell in red

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
1	Use "Fill Color" to identify a participant ID when assigning it. An ID that has been used should have a red background (see example).									1 = TREATMENT CONDITION					
2	Treatment Condition	Interventionist Initials	Date	Example: 999	Control Condition	Interventionist Initials	Date			2 = CONTROL CONDITION					
3	1000	AT	10/18/2019		2000	AT	10/28/2019			Condition	Interventionist	Date Scheduled	Date Completed	Participant ID #	Four Week Follow-up Date
4	1001	AT	11/15/2019		2001	AT	12/6/2019			1	Alex T.	10/18/2019	10/18/2019	1000	11/15/2019
5	1002	AT	12/4/2019		2002					2	Alex T.	10/28/2019	10/28/2019	2000	11/25/2019
6	1003				2003					1	Alex T.	11/15/2019	11/15/2019	1001	12/13/2019
7	1004				2004					1	Alex T.	12/4/2019	12/4/2019	1002	1/1/2020
8	1005				2005					2	Alex T.	12/6/2019	12/6/2019	2001	1/3/2020
9	1006				2006					2					1/28/1900
10	1007				2007					1					1/28/1900
11	1008				2008					2					1/28/1900
12	1009				2009					1					1/28/1900

- c. Record the same participant ID number at the top of the Assessment Feedback form



- d. Administer the baseline survey (~15-20 minutes)
2. Getting the data
    - a. Log into Qualtrics: <https://www.qualtrics.com/>
      - i. Username: 2020research.cannabis@gmail.com
      - ii. Password: research420!
    - b. Select the Brief Treatment for Cannabis-Related Problems survey
    - c. Near the top of the page, select Data & Analysis (#1)
    - d. Select the “Export Data” dropdown menu on the right-hand side of the page (#2)


The screenshot shows the Qualtrics web interface for a survey titled 'Brief Treatment for Cannabis-Related Pr...'. The top navigation bar includes 'Projects', 'Contacts', 'Library', 'Help', and a user profile icon. Below this, a secondary navigation bar has tabs for 'Survey', 'Actions', 'Distributions', 'Data & Analysis' (which is selected and highlighted with a green arrow labeled '1'), and 'Reports'. A 'Guide' icon is also present. Under the 'Data & Analysis' tab, there are icons for 'Data', 'Text', 'Cross Tabs', and 'Weighting'. Below these icons, there is an 'Add Filter' dropdown. On the right side, there are statistics: 'Recorded Responses 5' and 'Responses in Progress 0'. Below these statistics, there is a green arrow labeled '2' pointing to the 'Export & Import' dropdown menu. Below the dropdown menu, there is a table with columns: 'Recorded Date', 'Q9 - Please list any psychotropic medication(s):', 'Q48 - The researchers will either video or audiotape your session to ensure adher...', 'Q50 - Do you give the researchers permission to videotape or audiotape your inter...', 'Q4 - Do you consider yourself Hispanic or Latino/a?', 'Q5 - Are you a student?', and 'Actions'.

Recorded Date	Q9 - Please list any psychotropic medication(s):	Q48 - The researchers will either video or audiotape your session to ensure adher...	Q50 - Do you give the researchers permission to videotape or audiotape your inter...	Q4 - Do you consider yourself Hispanic or Latino/a?	Q5 - Are you a student?	Actions

- e. Click on “Export Data”
- f. Ensure the data format is set to “CSV” (#3)
- g. Ensure “Use Numeric Values” is selected (#4)
- h. Download the data (#5)

**Download Data Table** [Use Legacy Exporter](#)

3 **CSV** TSV XML SPSS User Submitted Files

 **Comma separated values**

This is a .csv file that can be imported into other programs. Each value in the response is separated by a comma and each response is separated by a newline character. If your responses contain special characters and you will open this export in Microsoft Excel we recommend using the TSV export. Qualtrics CSV exports use UTF-8 encoding, which Excel will not open correctly by default. [Learn More](#)

☒ Download all fields

4 ☒ Use numeric values  
☐ Use choice text

5 **Download**

[More Options](#) [Close](#)

### 3. Retrieving participant scores

- a. Open the Excel file labeled “Session Data Template”
- b. Open the Excel file containing the participant data downloaded in Step 2
  - i. Locate the current participant’s data by using the participant ID number in column “R” (#6)
  - ii. Confirm the correct participant ID is being used by looking at survey completion date and time in columns “A” & “B” (#7)



## APPENDIX O

### CST Manual

## Cannabis Specific Treatment Condition

### Session Content:

1. Assessment Feedback
2. Biopsychosocial Model
3. Decisional Balance
4. Change Plan

### Introduction to Session

Prior to participant arrival, the personalized assessment feedback summary and decisional balance exercise should already be filled out using the participant's scores from the baseline survey. Then, the following materials should be gathered and set aside in the therapy room: personalized assessment feedback summary, biopsychosocial model diagrams, decisional balance exercise, and change plan. Seats should be arranged at an angle, such that the participant and interventionist are not directly facing each other. If video recording is being used, angle the camera so that both the interventionist and participant will be in view based on the established seating arrangement. If this is not possible, priority is given to ensuring the interventionist can be seen. For audio recording, place the recording device close enough to where the participant and interventionist will be seated so the conversation can be heard at a normal speaking volume on the recording. The audio recording device should be placed in such a way that it will not distract the participant or interventionist during the session. Finally, before engaging with intervention content, the participant should be reminded of the rights of participants in research, approximate session length, possible benefits of participation, and follow-up survey incentive.

**Script 1:** *Thank you for agreeing to participate in this study. To start out, I'd like to talk briefly about what our session will look like today to give you an idea of what you can expect. We are going to discuss some of the factors related to your cannabis use. You may recognize some of the things we talk about from your survey responses. In fact, a lot*

*of what we discuss will be based on things you think are important to talk about. It's also likely that there will be some information that is new to you, so if you have questions at any point, please feel free to ask.*

*Our session today will last about one-hour and has four parts. We'll start by going over your personalized assessment summary. Then we will talk about the biological, psychological, and social factors that play a role in cannabis use. Next, we will review some of the pros and cons of cannabis use that are important to you. We will finish by setting some goals and strategies for how you can accomplish your goals.*

*It's important for you to know that I am not here to try and tell you what to do about your cannabis use. We know that not all cannabis use is problematic, and that many people don't want to quit. Instead, I'd like to talk about what your experience with cannabis looks like and work together from there. I might make some suggestions and offer things to consider, but ultimately you are the expert on your own life. [pause] What questions do you have so far?*

At this point, the interventionist should attempt to ascertain the participant's level of motivation. To assist the interventionist in taking appropriate steps, two potential profiles (the ambivalent participant and the motivated participant) are provided. For participants who do not provide clear evidence of his/her motivation thus far, a third, open-ended approach is suggested. Each of these profiles are discussed below.

The ambivalent participant. With an ambivalent participant, he/she may struggle to identify reason(s) for participation through statements involving sustain talk. Be patient and attentive to statements in favor of change. However, language supporting the status quo can be expected and should be monitored throughout the session as it may inform later stages of the

intervention. It is especially important with these participants to emphasize a non-judgmental atmosphere and to encourage exploration of ambivalence through both change and sustain talk.

**Script 2:** *It's pretty common for people to be unsure about whether or not using cannabis really is creating problems. After all, if there weren't things that are enjoyable about cannabis, then it would probably be easy to change! While we are talking today, I want us to be able to look at both the upside and downside of cannabis use. I'd like to start that by going over some of your survey responses with you and hearing your thoughts. How does that sound?*

The motivated participant. This participant profile is characterized by a disproportionate amount of statements in favor of change. Using an MI framework, this may be categorized in two different levels: preparatory and mobilizing. Preparatory statements commonly have thought or reasoning statements (i.e., *"I know I should use less, but I don't know where to begin."*), whereas mobilizing statements likely include statements of action or intent (i.e., *"I'm going to give my bong to a friend, so I don't feel tempted to use."*). It is important to match your level of support to the participant's level of motivation as closely as possible, as a mismatch could create difficulty in establishing rapport. For example, a participant providing preparatory language should not be met with a mobilizing response from the interventionist. This may cause the participant to feel pressure to defend the status quo.

**Script 3:** *It can be difficult to know where to begin when you are thinking about making a change. Instead of listing off generic ideas, I'd like to work together with you to create something personalized to you and your cannabis use. Please let me know if you have any questions as we move along through the session.*

Open-ended Approach: It may be difficult to ascertain the participant's level of motivation at this early stage of the intervention. This approach utilizes the MI concept of Engaging which serves to build the therapeutic alliance and clarify the participant's expectations for the session. This should be done by asking the participant about his/her expectations and listening intently to the responses. The interventionist should reflect responses back to the participant throughout this process. It is also appropriate to provide the participant with information about what to expect, though it is not always necessary.

**Script 4:** *A good place for us to start is by talking about expectations for our work together. What are you hoping to accomplish by coming in?*

Follow-up questions may include:

*How important is [participant's response] to you?*

*What are your expectations for how I can help?*

*How prepared do you feel to work on [participant's response]?*

This portion of the session serves two purposes. First, it begins the process of establishing rapport with the participant. It also provides an opportunity to gauge the participant's readiness for change. In doing so, you can determine how to most effectively engage with the participant throughout the session.

### **Part 1: Assessment Feedback**

Estimated Time: 15 minutes

After providing a session overview, the interventionist and participant review the assessment feedback form together. The form (Appendix A) is composed of three elements: an overview of the participant's use pattern, Severity of Dependence Scale (SDS) score, and Cannabis Problems Questionnaire (CPQ) score. Each of these should be discussed individually.



This portion of the intervention is concluded with a discussion of how the SDS and CPQ scores relate to each other. For example, if the SDS score is low but CPQ score is high, pointing out the discrepancy between the two scores provides an avenue for the participant to more clearly describe his/her use pattern.

**Script 5:** *To start out, I'd like to talk with you about some of the things you indicated in your survey responses. To help us with this, I have prepared a personalized feedback form to guide us along. One way that can help us understand your use better is to talk about what it looks like as it is happening and relate that to your scores on assessment measures.*

At this point, the interventionist should provide the participant with a summary of his/her reported use pattern. This provides the participant with an outside perspective of what his/her use sounds like. Afterwards, it is important to solicit feedback from the participant about what his/her use pattern looks like as it happens. There is potential for substantial variability in use based on the day of the week. Attention should be given to days where the score appears high compared to other days. For example, an expected pattern would be to see higher use on weekends (e.g., Friday and Saturday) than on weekdays.

**Script 6:** *You mentioned that you get the highest on (day(s) of the week). Does that sound accurate to you?*

If yes: *What does that look like as it happens?*

If no: *What would be more accurate?*

The second portion of assessment feedback is a review of the participant's SDS score. This is accomplished through informing the participant what his/her score is and whether it qualifies as dependence. Both the cutoff for dependence and an average pre-treatment score on

this measure (based on a clinical trial) is included on the assessment feedback form. Prior to giving feedback about the score, context should be given to what the scale measures. The participant's score may or may not appear congruent with how his/her described use. However, the intent of sharing this information is to help participants explore use more objectively, not to try and "convince" him/her of anything.

**Script 7:** *Next I'd like to share your score on the Severity of Dependence scale with you.*

*This scale ranges from 0 to 15, with 3 serving as a commonly used cutoff for cannabis dependence. Dependence can look different for people, but often involves thinking or feeling like you need cannabis. Based on what you reported, your score on the Severity of Dependence Scale is \_\_, meaning that you (do/don't) meet criteria of dependence. What's coming up for you after hearing that?*

Next, the CPQ is discussed. Similar to the SDS portion, a brief description of the CPQ should first be provided to the participant. Whenever possible, the participant should be solicited for feedback using MI strategies such as reflections and open-ended questions. It may be useful to pipe in specific items which were endorsed by the participant when filling out the survey. The interventionist should also offer the participant an opportunity to report problems experienced which are not represented on the scale.

**Script 8:** *I'd also like to go over some of the things you reported on the Cannabis*

*Problems Questionnaire, but before I do that, I'd like to tell you a little about it. There is a total of 21 questions about common social, physical, and psychological problems that might result from cannabis use. On average, people who seek treatment endorse between 6 to 7 total problems from it. Your score is \_\_. [pause]*

During the pause, monitor the participant's reaction to hearing the score, and include it in a reflection or open-ended question as appropriate. For example:

*You seem surprised by that.*

OR

*What is your reaction to hearing that?*

After allowing for a brief discussion, inform the participant of his/her scores on each of the subscales (social, physical, and psychological). This can be done in several ways and will likely vary based on relative endorsement for each. For instance, if a participant scores highly on one subscale, and low on the remaining two, a reflection noting the difference is warranted. This should both emphasize the high score and allow for exploration of reasons behind low scores.

**Script 9:** *It looks like most of the problems you have been experiencing are related to your physical health, but you're not having similar trouble with your psychological health or social life. I'm curious what your thoughts are about that.*

Finally, discuss the interaction between SDS and CPQ scores, number of using days in the past month, and reported distress level from the cannabis-related problems he/she experienced. This should focus on whether the scores are similarly high or low and how interactions between scores may provide meaningful information about the participant's use. The following script provides four examples of ways these scores may interact and how the interventionist might approach interpreting them with the participant. Sections from the assessment feedback form are listed in parentheses within the script to further assist the interventionist in identifying how interactions between scales may be used.

**Script 10:** *Let's take a few minutes to look at how these scores fit together.*

Example 1: *It looks like you don't feel like you need to use cannabis (SDS), yet you still experience a lot of negative consequences when you do (CPQ). What do you make of that? [pause]*

*You don't seem too bothered (distress rating) despite having problems (CPQ) when using frequently (past month use). [pause]*

Example 2: *I see that even though you don't have many problems (CPQ) from your use that bother you (distress rating), you've still found it difficult to control (SDS). What has that looked like recently (past month use)?*

Example 3: *Some of your scores suggest that you don't experience many problems (CPQ) or have trouble controlling your use (SDS). At the same time, you've also indicated that your use recently (past month use) might be concerning you (distress rating). [pause]*

Example 4: *On one hand, I noticed you don't seem to mind (distress rating) how your use is affecting you. On the other hand, you also show that recently you've been having trouble controlling how frequently you use (past month use; SDS) and have had quite a few problems because of it (CPQ).*

After talking about the interaction between measures, the conversation should begin to shift toward the second phase of the intervention – the Biopsychosocial Model.

## **Part 2: The Biopsychosocial Model**

Estimated Time: 20 minutes

At this stage of the intervention, the participant is introduced to the Biopsychosocial Model (BPSM) as it relates to cannabis use. Each of the constituent elements of the BPSM should be presented individually and in order as they are listed in the name (e.g., biological, psychological, and social, respectively). Although this stage involves a substantial amount of

psychoeducation, the interventionist should attempt to make it interactive whenever possible and use the diagram provided (Appendix B) in the intervention materials. Description of the BPSM elements and examples of how to approach this are provided.

**Script 11:** *Next I'm going to go over something called the biopsychosocial model. It's a holistic way of looking at how things like cannabis impact people. It assumes that there are biological, psychological, and social factors which all play a contributing role to problematic use. As you can see here, [point to diagram] all the parts can influence each other. We'll spend some time talking about each of them. Feel free to ask questions as we go through it.*

### **(Bio)logical**

The first element of the BPSM covered during the intervention is the biological aspect. This is composed of four parts: (1) how cannabis impacts the brain, (2) tolerance, (3) dependence, and (4) withdrawal. Basic content and examples for each are provided.

To begin, the interventionist provides the participant with information about the specific process that occurs in the brain when using cannabis. It is important to assess what the participant knows prior to providing information, and to offer opportunities for him/her to contribute personal knowledge about the subject. This aids in maintenance of rapport and collaboration during the session.

**Script 12:** *First we will talk about what is happening in the brain when a person uses cannabis. But before I start, I'm curious what you might already know about it.*

At this point, the participant will either begin explaining what he/she knows or will report having no knowledge of how cannabis impacts the brain. For participants who claim to not know about the specific impact of cannabis, proceed to script 12. However, if the participant claims to

have knowledge about the subject, two profiles may emerge. The first of which, is a participant who has accurate knowledge, and the second being someone with either partial or wholly incorrect information. For either case, it is important to ensure all the material for the session is covered, which may go beyond what the participant already knows. Thus, it is important in both instances to ensure all four parts are covered.

For the participant with accurate information, provide an affirmation and summary or reflection of the information he/she provided. Then, transition into the remaining content:

**Script 13:** *You're right! The THC in cannabis is the chemical that most clearly affects the brain. It sounds like you know quite a lot about it. There are some other things which also play a role that I'd like to talk about too.*

For the participant with inaccurate information, first acknowledge that the participant possesses knowledge on the topic based on personal experience. Then, provide a collaborative atmosphere aimed at dispelling myths based on the current state of research findings:

**Script 14:** *I can tell you've had a lot of exposure to this. I'd like to share the state-of-the-science on this topic. Some of this may differ from what you have heard, but we can discuss any inconsistencies as we go. Let's talk through it together.*

It is imperative to maintain a non-judgmental atmosphere when challenging inaccurate information provided by the participant. Proposing a collaborative approach as presented here is one potential avenue to preserve rapport.

At this time, the diagram should be used to provide a visual aid while discussing neurotransmitters, synapses, receptor sites, and anandamide. After a description of each of these is given, an explanation of how they are related to each other should also be provided. It may be

useful to provide an analogy to give the participant an alternative way of thinking about it that feels less scientific.

The amount of information covered, and how it is introduced, will depend on how much the participant shared prior to this. Repeating information he/she already shared may come off as redundant, while not covering something that was either missed or incorrectly explained hinders the efficacy of the intervention.

**Script 15:** *Take a look at this diagram with me.* [show participant diagram of synapses]

*This picture gives a pretty basic example of what is happening in the brain when using cannabis. It shows a synapse, which is a connection between brain cells. Your brain has billions of them. These cells communicate using chemicals called neurotransmitters.*

*These little dots represent neurotransmitters [point to dots], which are natural chemicals produced by the body. There are lots of different kinds and they can cause a lot of different feelings, but we'll only talk about a couple of them.*

*Anandamide is a neurotransmitter that produces a calming effect and sometimes pain relief. All of that anandamide [referencing dots again] has to bind to receptors in order to have an effect on the brain. That's what these little "V's" are [point out receptors].*

*However, neurotransmitters and the receptors for them are specific to each other. They fit together, kind of like two puzzle pieces. What questions do you have about this so far?*

Provide the participant with an opportunity to ask questions before continuing.

Subsequent information about the impact of cannabis on the brain relies on the participant understanding the basic process of synaptic transmission described above. Thus, if the participant has questions, the material which is not clear should be reviewed prior to moving into additional material. Once the participant expresses understanding of this, continue by explaining how THC

is involved, and what tolerance, dependence, and withdrawal are. Whenever possible, it may be helpful to recognize areas where the participant possesses knowledge. It is also be beneficial to incorporate psychoeducation about dopamine at this time.

**Script 16:** *Neurotransmitters aren't the only thing that can bind to receptors. In fact, THC molecules are shaped so similarly to anandamide that they use the same receptors. It's a lot like how puzzle pieces can fit together even if they're the wrong match. In other words, THC fills the same receptor as anandamide, but the brain can't tell the difference.*

*This can cause a cascade of problems that you might already know about. One of the first things that happens is developing tolerance. This happens through receptor down-regulation. Basically, when your brain is "flooded" with too many neurotransmitters, it reduces the number of receptors that they can fit into. Do you think you've had this happen to you? [pause]*

*If yes: What was that experience like?*

*If no: What do you think it would feel like if this process happened in your brain?*

*It's also common for people who develop tolerance to cannabis to start feeling like their body needs cannabis to feel normal. Part of the reason for that is because of how high levels of THC affect the body's ability to produce its own feel-good neurotransmitters, like dopamine. Dopamine is mostly known for creating elevated mood and euphoria, but your ability to produce it is affected by how much and how often THC is in your system.*

*For example, only using cannabis occasionally can cause more dopamine release, so you feel good. But if you're using it a lot, the body starts to produce less of it. When you*



*aren't getting the amount of dopamine that your body is used to having, the quickest way to feel normal again is to replace it with more THC.*

*When you first started using cannabis, you probably used less than you do now and slowly increased the amount over time, right? People often need to slowly decrease their use by tapering back on it. If you stop using a substance, like cannabis, abruptly, you may experience withdrawal symptoms. What do you know about withdrawal?*

In response to this, you are likely to encounter one of three response profiles. The participant may (1) begin explaining what he/she thinks withdrawal is, (2) claim to not know about withdrawal, or (3) claim that withdrawal does not occur with cannabis. Recommendations on how to proceed with each are provided.

For participants who begin to describe withdrawal, pay close attention to the detail he/she provides and provide feedback on the accuracy of that information. Ensure he/she knows the estimated timeline for experiencing withdrawal symptoms and provide some (2-3) examples of possible symptoms if necessary. Refer to the script 17 (Page 13) for examples.

Doesn't know about withdrawal:

**Script 17:** *Withdrawal is just a way to describe some of the feelings people initially experience when they cut back or stop using a substance to which they have become dependent. It is important to know that for cannabis withdrawal is typically not dangerous, just uncomfortable and temporary. For cannabis, withdrawal typically includes feelings that are opposite from what you feel when you use it. For example, during the week or so after stopping using cannabis, people tell us that they feel irritability, anxiety, or cravings, but it's important to remember that these feelings are*

*only temporary. People usually notice symptoms of withdrawal within the first two days after the last use. In general, these symptoms are gone after seven to ten days.*

Denies possibility of cannabis withdrawal:

**Script 18:** *It looks a little bit different for everyone. Some people experience stronger symptoms, and others might barely notice anything, which could make it seem like there isn't any withdrawal. The symptoms people do experience from it usually start within two days after the last use and go away after seven to ten days.*

Regardless of the response profile here, it is likely that the participant will exhibit some reaction to the timeline of withdrawal symptom onset and duration. The recommended approach in response to this the instillation of hope by describing the neuroplasticity of the brain, particularly receptor regeneration, and that the body will eventually return to a similar level of functioning prior to heavy use.

**Script 19:** *A really important thing to remember about withdrawal is that it's only temporary. Even though the brain doesn't grow new cells, it can reshape how the ones it has are used. Just like how it can decrease the number of receptors in the synapses, it can regenerate them too. This is called neuroplasticity. You can think about the word 'plastic' being the important part of that though. Similar to how plastic is flexible and can bend to adjust to things, our brains are flexible in how they operate and can adjust to changes.*

Allow for the participant to share his/her thoughts or ask any remaining questions regarding the biological impact of cannabis and transition the focus into psychological functioning.

**(Psycho)logical**

The following section reviews how to introduce the participant to the psychological component of the BPSM. The review of this section is two-fold. First, classical conditioning is explained in relation to items associated with cannabis use (e.g., paraphernalia). The participant may be aware of classical conditioning and should be encouraged to share personal experience that may relate to it. This should segue into positive and negative expectations for use. It may be helpful to use this to relate back to withdrawal, as it provides a concrete example which connects the biological and psychological components.

**Script 20:** *The next part of the biopsychosocial model is the psychological component.*

*One of the ways this can show up is through classical conditioning. If you're not familiar with it, this was first discovered by a researcher named Pavlov. He paired the ringing of a bell with the smell of meat powder with dogs. Since the meat powder smelled like food, the dogs associated the sound of a bell with being fed. Once the dogs had formed this association, he could just ring the bell and the dogs would begin to salivate because that sound was a signal that they had paired with the expectation of receiving food.*

*The same type of conditioning happens for people. What is interesting is that these associations form even when we aren't aware of them. For example, a bong/wrapper/pipe/dab rig are like the bell that Pavlov used. To someone that doesn't use cannabis, these objects do not elicit any reaction. However, for someone who has used these products consistently, they've been associated so strongly with using cannabis that seeing them can trigger a desire to use, even if there isn't any cannabis around.*

*What do you think about that?*

Provide follow-up questions and reflections as necessary to further encourage participant involvement. Then transition into discussing positive and negative expectations for use.

**Script 21:** *Something that's related to conditioning are expectations for use, or what you think will happen to you, what you will feel like, when you use cannabis. Expectancies can be both positive and negative. What comes to mind for you when you think about that?*

More explanation of expectations may be necessary to orient the participant to the meaning of expectations for use. For the purposes of the intervention, it is beneficial to have him/her consider enhancement of experiences or avoidance of negative experiences as expectations. Additionally, it is important that both positive and negative expectancies are covered. Thus, if the participant can easily relate to one of these types of expectancies, the interventionist should supply an example to illustrate the other. The following script provides a brief explanation of both types however an interventionist may only need to provide information for one.

**Script 22:** *Expectations are frequently behind the desire to use or not use cannabis and are influenced by the perceptions people have about use. This can include what a person expects to feel or experience while high, which can change over time. For instance, when people first start using cannabis, there is usually an expectation that it will make something more fun. However, after regular use, many people use it with the expectation that it will prevent withdrawal symptoms. In both cases, there is a positive expectancy, but the reality changed from enhancing an experience to preventing potentially unpleasant feelings. What examples come to mind for your own positive expectations?*

Using reflective listening, discuss the participant's experience of positive expectancies, emphasizing any statements which may lead to change talk.

*Complementary to this are negative expectations for use. These are usually associated with reasons why people choose not to use cannabis. Examples of this could be if someone thinks they will be paranoid when they use cannabis, or the fear of being negatively judged by others. What kinds of things come to mind for you about that?*

Again, monitor the participants response and provide reflective statements which support change talk. Remember, the examples provided may not be relevant for every participant. The details of the example(s) used should always be informed by what is salient for the participant.

### **Social**

The last component of the BPSM reviews the social aspect of use. This section emphasizes the role of the participant's network of cannabis-using friends and how one's social network influences personal use. This can be accomplished in several ways, such as highlighting similarities and differences between the participant's use and the use of other people in his/her social network. It is appropriate to inject information provided by the participant earlier in the session if applicable (e.g., *Earlier you said ...*). The example provided assumes no prior relevant information was given.

**Script 23:** *The last part of this model has to do with the people in your life who also use cannabis and how your associations with them relate to your own use. I'd like to hear about your group of friends, so I can understand your home and social life better. How would you describe it?*

The following are a series of potential follow-up questions to assist the interventionist in guiding this portion of the session. Appropriate MI skills (e.g., reflections, summaries, etc.) should also be used when possible based on participant responses.

*How is your use different from other people you know?*

*Would you say your use looks like theirs?*

*What would ideal use be when you are hanging out with your friends?*

*What would it be like to change the way you use around your network?*

This list of questions is far from comprehensive and is intended to serve as a guide for interventionists during this component of the BPSM. It does not preclude the use of other MI skills or exploration into other relevant areas of the participant's social network. In addition to these questions, two participant profiles are offered as examples for how the interventionist may proceed with the session. The first profile is based on a participant who reports heavier use than his/her peers while the second profile is based on a participant who has a heavy using peer group.

Participant with lighter using peers:

**Script 24:** *From what you've told me, it seems like you use more than your friends. How do you think they feel about your use?*

*It might be helpful if we look more closely at that. Tell me about what usually happens when you and your friends get together.*

Participant with heavy using peers:

**Script 25:** *You sound like you're feeling stuck. Part of you feels obligated to be "one of the gang" while your friends are using. At the same time, you really don't want to use as much as them. It's pretty common when people get together for them to think that it's normal or acceptable to use more cannabis than they would if they were alone. It's usually referred to as "pluralistic ignorance". Basically, it means that most people would agree that using excessively isn't normal or acceptable, but they don't realize they aren't alone if they feel this way. What do you think would happen if you were the first person to stop using in these situations?*

After discussing social influences with the participant, the session focuses directly on personal reasons for and against use. Prior to transitioning into the next stage of the intervention, the participant should be given an opportunity to ask any remaining questions about the BPSM. If the participant has several questions, it may be necessary to answer some questions and ask that the remaining questions be held until the end of the session. The interventionist should limit this to no more than five minutes.

**Script 26:** *I know we covered a lot of information so far. I'd like to pause for a moment here and see what questions you have before we move on.*

After five minutes: *These are all great questions! I'd like to answer all of them as completely as possible, and I also want to make sure we get to everything, Lets come back to this in a little bit.*

### **Part 3: Decisional Balance**

Estimated Time: 15 minutes

In this stage of the session, the interventionist reviews the decisional balance exercise, developed by Elliott and colleagues (2011), with the participant. The purpose of the decisional balance is to highlight ambivalence the participant has and draw out change talk. This exercise is included in the baseline survey and should be completed by the participant prior to the session. As noted previously, these responses should be retrieved from the survey and included with other session materials.

Items are ranked on a scale of 0 (does not describe my use) to 10 (perfectly describes my use). Consistent with the 2x2 format used in early versions of the decisional balance exercise, the scale includes both pros and cons relating to use. Special attention should be paid to any items endorsed at or near 10.

**Script 27:** *Now I'd like us to review another part of the survey you filled out. It is a way to help us get a better idea of some of the specific things that are positive and negative about cannabis use for you.*

During this stage, the interventionist's primary focus is to elicit and respond to change talk from the participant. Change talk typically presents itself in two ways: preparatory and mobilizing. Preparatory change talk reflects ambivalence and is characterized by statements expressing desire, ability, reasons, and need to change (DARN; Miller & Rollnick 2013). Mobilizing change talk is inferred from statements of commitment, activation, and taking steps (CAT; Miller & Rollnick, 2013). The DARN and CAT acronyms are intended to provide a useful mnemonic for interventionists to quickly identify and respond to a participant's statements that favor change.

Response to change talk is accomplished using core MI skills identified by Miller and Rollnick (2013) as open-ended questions, affirmations, reflective listening, and summaries (OARS). These skills should be used in conjunction with each other, rather than relying heavily on a single skill. For example, Miller and Rollnick (2013) recommend offering two reflections for every one question asked, though this is not intended to be a rigid formula. Below are examples of the two forms of change talk discussed, and one potential way an interventionist may respond in the style of MI.

**Script 28:**

Preparatory Change Talk:

PARTICIPANT: *It would be nice if I was able to smoke less during the week.*

INTERVENTIONIST: *You have already identified ways that might improve things.*

Mobilizing Change Talk:



PARTICIPANT: *I plan on giving my friend the bong I keep at my place.*

INTERVENTIONIST: *That's a great step to take! You're making your health a higher priority.*

In addition, it may be necessary for the interventionist to respond to sustain talk to evoke change talk from the participant. An approach offered by Miller and Rollnick (2013) is through the use of reflective listening, specifically including straight, amplified, and double-sided reflections. A possible statement from a participant is provided, followed by examples of each type of reflection that the interventionist may offer in response.

**Script 29:**

PARTICIPANT: *I'm not sure that my problems are caused by smoking weed.*

Straight Reflection: *You haven't noticed any issues that are solely because of your use.*

Amplified Reflection: *There is no way that cannabis could be responsible for the problems you've been experiencing.*

Double-Sided Reflection: *It's easy for you to think of the upside of getting high and you're still noticing problems that could be related to it.*

At this stage of the intervention, several participant profiles may emerge. These profiles are intended to provide examples of different approaches based on possible response patterns to the decisional balance scale. Although guidelines are offered for use, **interventionists should use best judgment in choosing which profile is best fits for the participant.** Each is discussed in turn.

Typical Endorsement Profile

This profile is characterized by the participant endorsing some items (approximately 3-5) for both pros and cons as markedly higher than the other items on each respective list. For these

cases, the highest ranked items should be identified for each list and discussed. Allow for discussion and exploration of pros for use first. By following this with similar attention to cons of use, the participant will be less likely to speak in support of the status quo.

**Script 30:**

Exploring pros of use: *I've marked some items that stood out to me from both lists. What makes \_\_\_\_\_ an important 'pro' of use?*

Exploring cons of use: *There are a couple of things I noticed on the other list too. Tell me more about \_\_\_\_\_.*

The number of items chosen for discussion will also vary based on remaining session time. In cases where the interventionist is behind the suggested timeline, it may not be possible to discuss all highly endorsed items. The interventionist should solicit the participant's input regarding what items are of greatest importance as demonstrated below. This should follow the same format of reviewing a pro of use first, then discussing a reported con of use.

**Script 31:** *There are a few things I've noticed that are important to you. Looking at what you've identified, what seems most important to talk about on this list?*

As a reminder, the interventionist's main focus during this stage is to elicit and respond to change talk wherever possible. However, reflection of sustain talk may also be necessary to provoke the participant into making statements in favor of change.

High Endorsement Profile

This profile is characterized by the participant endorsing a substantial number of items (approximately 6 or more) on each scale at a value of 10. This will likely make it difficult to narrow responses for discussion. In this case, there are two complementary approaches the

interventionist may take. First, looking over the responses for apparent themes can provide direction.

**Script 32:** *Based on your responses here, it looks like you have a lot of things you like and don't like about your use. I'm noticing that the things you like about it tend to be related to \_\_\_\_\_. Does that seem right to you?*

The second approach is to identify items which are dissimilar from the others endorsed.

**Script 33:** *It's easy to see that there are a lot of things you like about your use. However, \_\_\_\_\_ stands out to me because it seems a bit different from the other things you identified here. What do you make of that?*

After a discussion of pros of use, this process should be repeated in a similar fashion for cons of use.

### Low Endorsement Profile

This profile is characterized by the participant failing to endorse most or any items on both scales as strongly representative of his/her use (e.g., ratings of approximately 6 or lower). Even though participants have the option to include novel responses, they may feel uncomfortable or unwilling to do so when taking the survey. For these situations, the interventionist should remark on the low endorsement, and attempt to elicit change talk from the participant.

**Script 34:** *From what I'm seeing, it doesn't look like any of the things on these lists are very true for you. What would be a better way to describe the things you like about cannabis? What are some things you don't like?*

If the participant continues to use sustain talk in response to these efforts, the interventionist can also refer to the highest endorsed items reported on the scale.

**Script 35:** *Not everyone's use looks the same. It can be just as helpful to know what doesn't feel applicable to you. It looks like \_\_\_\_ is the one that fits best for you though. What can you tell me about that?*

#### Polarized Endorsement Profile

This profile is characterized by the participant endorsing items from one scale as substantially higher than those for the other scale. The differences across endorsement of scale items should generally be at least 3 or more, however this approximation does not supersede interventionist's judgment. In these cases, directly address the discrepant responses and be prepared to respond to ambivalence and/or sustain talk.

**Script 36:** *Looking at this, it seems like the (pros/cons) are a better description of what cannabis use is like for you. In your opinion, how accurate of a reflection on your use is that?*

Depending on whether the polarization favors pros or cons of change will likely dictate whether the participant will respond with change or sustain talk. The interventionist should be prepared to use reflective listening if confronted with sustain talk. In doing so, a natural response would be for the participant to begin arguing against his/her previous statements, thus providing evidence for ambivalence. See script 29 for examples of how to respond to sustain talk using reflective listening.

#### **Part 4: Change Plan**

Estimated Time: 10 minutes

In the final stage of the intervention, the participant and interventionist collaboratively develop a change plan. The purpose is to assist the participant in developing one or more goals pertaining to his/her cannabis use. The goal(s) will be supported with reasons to change,

strategies to help reach the goal(s), planned rewards for goal attainment, and a target date to implement the change. The Change Plan form provides a written layout of this. When introducing it to the participant, emphasis should be placed on making it a collaborative exercise. The change talk elicited in the previous stage should provide a natural segue into the change plan.

**Script 37:** *Based on what we've talked about so far, it seems like you have a lot of insight into your use. Let's take that a little further and try to come up with at least one personal goal. What ideas do you have about that?*

The participant may or may not already have a goal in mind, so the interventionist should be prepared to assist in generating and distilling ideas. This process should follow the SMART goal framework: specific, measurable, achievable, realistic, and timed. It may be necessary to offer suggestions on ways to approach change as a guide. For example, participants interested in achieving abstinence may be more receptive of goals that build toward cessation of use, while those looking to change use without quitting may respond more favorably to goals targeting when or with whom he/she uses. Regardless of the participant profile encountered, ensure all aspects of the SMART goal framework are applied. The following script provides guidance on how to proceed when a participant's goals are unclear.

**Script 38:** *I don't know you nearly as well as you know yourself, but I think together we could come up with something that would work for you. If you would like, I could provide a couple suggestions of the types of goals that tend to work for people. Would that be helpful?*

If the participant agrees to hear advice, provide a brief menu of options to orient him/her to different types of goals. The interventionist should feel free to offer any ideas he/she has, as the goals below are not an exhaustive list.

**Script 39:** *There are two types of goals that come to mind. The first kind are goals that focus on reducing the amount of cannabis use, while the second kind are more about cannabis-related problem reduction. Which of those sounds like it would best fit for you?*

If the participant declines the offer for advice, do not provide any. Instead, attempt to elicit change talk from the participant by using information previously discussed in session as it applies to goal setting.

**Script 40:** *Earlier you said that \_\_\_\_\_ was one of the biggest problems you struggle with. How might you go about addressing that?*

Next, the interventionist should help the participant name the salient reasons to change his/her use. This should incorporate information from the decisional balance exercise as well as other instances during the session where relevant information was gathered.

**Script 41:** *Let's look back at some of the things we talked about before. It looks like \_\_\_\_\_ is an important reason for you to change. What else jumps out at you here?*

Take the time to write down the reasons identified by the participant as important. Remember that the participant is the expert on his/her own life, and that judgment should be trusted. If the participant struggles to identify reasons for change, materials used in earlier stages of the intervention (e.g., CPQ and decisional balance responses) should be used as a guide.

After creating a list of reasons for change, the focus turns toward strategies for goal attainment. The strategies developed should be specific to a goal. The number of strategies will vary for different goals, however at least one strategy should be discussed for every goal

developed. In general, the following steps should be taken when developing each strategy: (1) state the goal, (2) operationalize the change, (3) confirm strategy and write it down on the change plan.

**Script 42:** *So far, we have answered both the “what” and “why” questions by creating goals and the reasons why they’re important. Now let’s work on the “how” by coming up with some strategies. The first goal we talked about was \_\_\_\_\_. What might get in the way of that plan?*

So far, this script has completed the first step in strategy development and given the participant an opportunity to begin the second step of operationalizing change. During this step, it is crucial that the strategy chosen is realistic. Attempting to implement an ineffective strategy will likely result in failure to achieve the desired outcome. Therefore, it may be necessary to ask questions about the participant’s proposed strategy. These questions should be assessing for the participant’s willingness to stay committed to his/her plan and helping identify ways to overcome potential challenges. This serves two purposes: it gets participant to argue for change and evaluates the likelihood of the strategy being effective. To maintain consistency with MI, permission should first be obtained from the participant as shown.

**Script 43:** *I’m interested in the plans you have come up with so far. Would it be okay if I ask you a few questions about them?*

Assessing for willingness:

*How likely do you think it is that you’ll be able to do this?*

*Do you think you will really do that?*

Assessing for effectiveness:

*How would you stick to your plan if \_\_\_\_\_ happened?*

The participant may initially struggle to develop strategies. In these cases, it is important to validate these efforts by acknowledging the difficulty of the task. Afterwards, one approach to getting him/her started is by offering guidance. This should be done in a manner consistent with MI, as shown below.

**Script 44:** *It can be challenging to come up with ideas for something you're relatively new at. I can tell you a few ways that people are often successful in changing their cannabis use, but you're the one who decides if you think they'll work for you. Would you be interested in hearing some things that other people have found useful?*

If the participant grants permission, proceed with a brief menu of options as shown below.

*Sometimes people find it easier to set boundaries on days they allow themselves to use cannabis. Another way is to make rules such as not allowing yourself to use on nights before work or school. Maybe even limiting the amount you keep on hand as a way to reduce the temptation to use. Which of those stands out to you?*

Once the participant has developed a strategy that will suit his/her needs, record it on the change plan, and repeat the process as needed for remaining goals or for incremental progress on the same goal. To evaluate the participant's willingness to adhere to his/her stated goal(s), the interventionist may use a confidence ruler. This process can be repeated as many times as necessary.

**Script 45:** *I'm curious about how confident you feel about the goals we've talked about so far. You said that \_\_\_\_\_ was your first goal. On a scale of 1 to 10, where 1 means not at all prepared and 10 means completely prepared, how are you feeling about that?*

Next, the participant should be encouraged to consider possible activities to occupy his/her time in service of goal attainment. This can provide additional strategies which reduce the



likelihood of use due to boredom. These activities can be things the participant found enjoyable prior to cannabis use but are not limited to it. The interventionist should support the participant's autonomy in generating a brief list.

**Script 46:** *Now that we've got some realistic goals and ways to meet them, let's think about what you might do with some of the extra time you'll have on your hands. What sort of things do you like to do when you're not using cannabis?*

Provide the participant feedback, and make any recommendations needed to ensure the plan is realistic.

The last item on the change plan, and final part of the session, is to set a target date for the changes to be implemented. This may be immediate however this should not be expected. As with the other areas of the change plan, the target date needs to be realistic for the participant.

**Script 47:** *I think we have a strong plan here. When do you think you will start on it?*

Provide follow-up questions as necessary to ensure the participant has a set date to begin implementing the strategies discussed to achieve his/her goal(s). Any questions about the start date should be designed only to provide clarification. For example, if the participant says he/she will start "this weekend", the interventionist should follow-up by asking about the specific day.

Choosing the target date should be driven by the participant. Any attempt by the interventionist to rush the process may elicit sustain talk and should be avoided.

### **Session Conclusion**

Before concluding the session, there are a few administrative procedures to complete. The participant should be given the completed personalized assessment feedback summary and change plan. All participants should be thanked for attendance and reminded of the follow-up survey and incentive. The email address he/she has provided should also be verified at this time.

**Script 48:** *Thank you again for your participation today! I hope what we talked about is helpful. You are welcome to keep any of the materials we used, and I encourage you to hang on to your personalized assessment feedback and change plan. We will also be sending you a follow-up email in a month with a link to a survey that will look similar to the one you took today. As an incentive to participate, we are offering Amazon gift cards that we send out via the email you provide. Do you have any questions before you go?*

In rare instances, a participant may disclose information which warrant additional psychological services (e.g., expressing risk). In these cases, the interventionist should encourage him/her to seek follow-up with a higher level of care using the list of referral resources. This should be approached as if it is part of the standard session protocol.

**Script 49:** *Based on what we talked about when you said \_\_\_\_\_, you might want to talk to someone at the (Psychological Services Center or Health Network). I have the contact information here.*

All participants can be referred to the Psychological Services Center for individual counseling. For participants who are affiliated with Colorado State University, the Health Network can be provided as an additional referral resource.

## APPENDIX P

### HSM Manual

## Healthy Stress Management Condition

### Session Content:

1. Levels of Stress
2. The “Four A’s”
3. Coping Strategies

### Introduction to Session

Estimated time: 2-3 minutes

Prior to participant arrival, several sheets of paper and pens or pencils should be gathered and set aside in the therapy room for use during the final stage of the session. Seats should be arranged at an angle, such that the participant and interventionist are not directly facing each other. If video recording is being used, angle the camera so that both the interventionist and participant will be in view based on the established seating arrangement. If this is not possible, priority is given to ensuring the interventionist can be seen. For audio recording, place the recording device close enough to where the participant and interventionist will be seated so the conversation can be heard at a normal speaking volume on the recording. The audio recording device should be placed in such a way that it will not distract the participant or interventionist during the session.

**The Healthy Stress Management (HSM) condition does not include any cannabis-related content.** It is imperative for the interventionist to redirect any attempt by the participant to discuss information specific to cannabis. Several scripts are provided throughout this manual to aid the interventionist in effectively and appropriately managing these situations. Finally, before engaging with intervention content, the participant should be reminded of the rights of participants in research, approximate session length, possible benefits of participation, and follow-up survey incentive.

**Script 1:** *Thank you for agreeing to participate in this study. To start out, I'd like to talk briefly about what our session will look like today to give you an idea of what you can expect. We are going to discuss factors which contribute to stress and how it is managed. Stress is something that can lead to a lot of unhealthy behaviors. Our goal today is to help identify stressors and ways to handle them in a healthy way. The session will last about an hour and has three parts. We'll start by talking about the different levels of stress people experience. After that, we will go into a few different ways people respond to stressful experiences. The last thing we will do is work together to develop some personalized coping strategies for you. What questions do you have before we begin?*

At this point, the participant the interventionist can anticipate one of four potential participant profiles to emerge: participants who have questions about cannabis use, have questions related to HSM content, have no questions, or are frustrated by placement in the control condition. Explanations of each profile are provided along with examples of how to proceed with each response type.

Participants asking about cannabis. Participants are likely to expect the interventionist to provide some evidence that cannabis will be discussed during the session. For treatment fidelity purposes, interventionists must be prepared to acknowledge the participant's question(s) without opening the session up to discussion about his/her cannabis use. There is potential for a great deal of variability in how this may occur. However,

As a result, some examples for how to respond to this profile are provided.

PARTICIPANT: *When will we talk about marijuana?*

**Script 2:** *Our work today will focus more broadly on how stress and how to manage it before it leads to unhealthy behaviors. So, instead of focusing on a single thing, we'll talk about coping strategies that can apply to many different situations.*

PARTICIPANT: *How does that relate to marijuana use?*

**Script 3:** *Good question! Rather than focusing on a specific behavior that might be in response to stress, we'll spend our time looking at the stressors themselves. By doing this, we can work on strategies that are useful in a lot of situations instead of limiting ourselves to one.*

PARTICIPANT: *What's the point if we aren't talking about marijuana?*

**Script 4:** *Great question! The idea behind looking at stress is that it can lead to a ton of different things that are potentially harmful to your health. So, by getting a better understanding of how stress shows up, how to manage it, and what it looks like for you, we can help you better prepare to manage it when it happens.*

Participant with questions related to HSM content. Some participants may express interest in one or more of the components of the session layout which was just described. This can be interpreted as a sign of interest in session content and may tempt the interventionist to begin discussing portions of the session prematurely. The following script provides guidance on how this may be mitigated.

**Script 5:** *It's great that you're already thinking about some of the things we will discuss! I'm looking forward to getting into some of those things with you. It would probably make more sense if I answer these questions as we go. If, for some reason, we don't get to one of your questions along the way, we can take some time at the end to come back to it. How does that sound?*

Participant with no questions. It may also be common for participants to deny having questions at the outset of the session. Though this is not cause for concern, it should be recognized by the interventionist as an opportunity to reaffirm a collaborative environment with the participant.

**Script 6:** *If at any point in our session today you have questions, please feel free to stop me. We'll also pause at several points throughout the session to talk about how your experiences might be similar or different from what we are talking about. How does that sound?*

Frustrated participant. This profile is intended to serve as a last resort for interventionists when faced with a participant who is upset when informed the session will not include a discussion of cannabis use or indicates that they figured out they are in the control condition. When faced with this profile, interventionists should disclose that the participant has been randomly assigned to the control condition and that he/she is entitled to receive the treatment condition as well. The participant should also be provided with information about the broad applicability of the HSM protocol and provide him/her with an open-ended question assessing their willingness to continue.

**Script 7:** *I can see that you're disappointed to hear what our session will focus on today. There are a couple of things I want to make sure you know so you can make the most informed choice possible about what you would like to do next. Since our work together is part of a research study, everyone gets randomly assigned to one of the two treatment conditions. You're already familiar with what the Healthy Stress Management condition includes. However, it is important to know that we'll go over a wide variety of skills in it which can be useful in a many different situations, including those involving cannabis.*

*The other condition is called the Motivational Enhancement and Cognitive Behavioral Therapy condition. It is similar in structure, except that it focuses specifically on cannabis use and doesn't spend much time on coping strategies.*

*We have a couple of options for what we can do. If you'd like, you can discontinue your participation in the study and receive the other condition I was talking about, today. On the other hand, if we keep going with the stress-focused session today, we'll contact you in a few weeks to offer you an Amazon gift card in exchange for your participation in the follow-up survey, and we'll offer you the other condition at that time. Which of those would you like to do?*

Chooses HSM: Proceed to script 8 on page 6.

Chooses CST: Proceed to script 58 on page 28 for the alternate session conclusion.

This portion of the session serves two purposes. First, it allows the interventionist to establish a collaborative working relationship conducive to building rapport with the participant. It also orients the participant to the content of the HSM protocol. The type of participant profile encountered during the introduction also provides the interventionist an opportunity to gain insight into the level of engagement the participant has with the material. This insight can be used to inform later stages of the session.

### **Part 1: Levels of Stress**

Estimated time: 20 minutes

After providing the introduction to the session content, the interventionist reviews the levels of stress with the participant. This stage of the intervention consists of three hierarchical elements: low, moderate, and high levels of stress. Low levels of stress are characterized as healthy and typically go unnoticed by people. Moderate levels of stress are further divided into



two sub-components: positive and negative. Moderate positive stress is commonly considered to be motivating and aids people in task completion. Conversely, moderate negative stress often results in feeling overwhelmed and may result in anxious feelings. Finally, high levels of stress described as unhealthy and commonly associated with health complications (e.g., sleep and appetite disturbances, other somatic complaints).

In the scripts that follow, each of these levels of stress is introduced. Throughout this stage of the session, the interventionist should solicit participant knowledge and examples that pertain to the content being discussed. The participant may attempt to incorporate cannabis-specific examples into the session when prompted for examples by the interventionist. The interventionist should make efforts to maintain rapport by acknowledging the participant's input, however ongoing discussion of cannabis should be avoided. Examples of how this may occur are provided to assist interventionists in effectively responding in such situations.

**Script 8:** *To start out, lets talk about the different levels of stress and how they might be showing up for you. Even if you're already familiar with some of this, it can be helpful to have a clear picture of what we mean when we talk about levels of stress. Doing this can make it easier to understand what kind of stress you might be experiencing.*

*It's easy to think about stress as being low, medium or high level. Let's take a little time to talk about each of these. I'm especially interested in hearing about what your experience with the different levels has been like. How does that sound?*

Allow the participant to take a moment to reflect on his/her experience of stress. The interventionist should try to answer any questions that arise unless they pertain to cannabis use. Remember that discussion about cannabis use is to be avoided in the HSM treatment. Once the participant expresses that he/she is prepared to begin discussing the levels of stress, discuss each

level in order from low to high. The process for each is as follows: 1) introduce the stress level, 2) elicit participant knowledge, 3) provide either affirmations for correct knowledge or information for incorrect or missing knowledge, 4) elicit examples from the participant. Scripts for each level of stress are provided in order.

**Script 9:** *Let's talk first about low level stress. But before I get too far into it, I'm curious what you might have in mind about it. How would you describe low level stress?*

There are three participant profiles that may emerge after introducing the level of stress and attempting to elicit his/her knowledge about it: participants with correct prior knowledge of the stress level, those with incomplete or incorrect information about it, and those with no prior information. Each of these profiles are discussed in turn.

Correct information profile. To meet criteria for this profile, the information the participant provides must be the same or similar to the conceptualization of low-level stress as described in this manual. Although the information does not need to match verbatim, interventionists should use his/her judgment to assess if the participant is conveying an accurate understanding of the type of stress. An appropriate response to this profile is to affirm accuracy in the participant's response using reflective listening.

**Script 10:** *You're absolutely right! Low-levels of stress often go unnoticed because of how little they impact most people. At the same time, it is normal for people to experience some amount of stress, even if it is minimal. It wouldn't be realistic for someone to expect they can eliminate all their stress. What examples from your own life come to mind that might fit that description?*

Incomplete or incorrect information profile. Participants in this profile may have a partial or inaccurate understanding of what low stress is. For example, someone who experiences

chronically high stress may have difficulty relating to what low stress situations entail. For these cases, it is important to first acknowledge the participant's effort using an affirmation, then provide corrective feedback.

**Script 11:** *It's pretty clear that you have experience with this. Since stress can take on a lot of different forms, I'd like to make sure we are starting out in the same place. Feel free to jump in if anything seems unclear or different from what you've experienced. An important feature of low stress that distinguishes it from higher levels is that it can easily go unnoticed. Because of this, it's often considered to be the 'healthy' kind of stress. Let's talk about a time when you think this was going on for you. [pause]*

No information profile. In rare instances, a participant may indicate that he/she is not aware of what constitutes low stress level. The interventionist should validate the difficulty of attempting to describe it, provide a brief explanation of it, and allow for any questions the participant may have.

**Script 12:** *It can be difficult to know what low stress looks like since it is something that people can easily ignore. You might think of this as having 'healthy' stress or maybe even not notice when it's happening. What do you make of that?*

Regardless of which profile used, the participant may struggle to identify a time when he/she was experiencing low level stress. If this happens, do not pressure the participant to generate an example from his/her own life. Instead, provide an example which models the process for when medium and high stress are being discussed.

**Script 13:** *It might be easier if I give an example of what a low stress situation could look like. For instance, if you planned to have a few friends over and you wanted to clean up a little before but didn't have time. If you knew those friends wouldn't be bothered by it, the*

*stress caused by not getting a chance to clean probably wouldn't be very noticeable. Can you think of anything you've experienced like that?*

At this point, the participant will likely be oriented to how this stage of the session is organized. If the participant provides an example of low stress from his/her life, the interventionist should acknowledge it and begin to transition into the next level of stress. However, if the participant is still unable to generate an example of low stress, the interventionist should provide encouragement by offering to revisit the topic later if needed.

**Script 14:** *Not every level of stress makes as much sense for everyone. The other levels of stress that we will talk about might be easier to relate with. For now, let's try moving on to the next one. We can always come back to this if you come up with questions or ideas about it later.*

Next, the interventionist should introduce the moderate level of stress. Moderate stress can be characterized as positive or negative. Positive stress is motivating and assists people in completing tasks, while negative stress is generally described as feeling overwhelmed. When introducing these two types of moderate stress, begin with positive stress and then discuss negative stress. Maintaining this order is important as it will facilitate the transition into the last stress level discussed during this stage of the intervention. For both positive and negative stress, the correct information, incomplete/incorrect information, and no information participant profiles are provided.

**Script 15:** *The next level I'd like us to talk about is moderate stress. This one is a little bit different from the others because it can be either positive or negative. Let's look at them one at a time. What comes to mind for you when you think of positive stress?*

Correct information profile. This participant profile provides an example of how to respond when a participant has prior knowledge that is congruent with the information provided in the session protocol. In these cases, the interventionist should affirm the participant's knowledge of the topic and elicit an example from the participant.

**Script 16:** *That's right! When people experience positive stress, they feel motivated to get something done in response to the stress. Tell me about a time when you experienced this.*

Incomplete or incorrect information profile. This participant profile provides guidance on how to respond to a participant who has a misperception of positive, moderate stress. When this happens, the interventionist should attempt to encourage the participant by affirming his/her effort instead of focusing on the content of the participant's response. Interventionists should not affirm knowledge when it is incorrect. After providing an affirmation, provide corrective feedback to the participant and elicit an example from the participant's experience.

**Script 17:** *I appreciate how much thought you are giving to this. Since the idea of stress is usually negative, identifying when you're experiencing positive stress can be a little more difficult to pin down. In general, positive stress is actually more about having some sort of task or deadline that is motivating you to work towards it. When have you had an experience like this?*

No information profile. This participant profile provides an example of a neutral approach toward providing information about positive stress to the participant. This profile assumes that the participant does not attempt to describe positive stress. In these cases, the interventionist should remind the participant of the collaborative nature of the session before providing information and eliciting examples.

**Script 18:** *It's okay if you've never heard of this before, but if it starts to sound familiar, please feel free to jump in and tell me what you know about it. Positive stress is really just a way to describe how having a job to do, or a deadline to meet, can be motivating because it provides you with a push to get something done. When have you had something like that happen in your life?*

After allowing for a brief discussion of positive stress as it relates to the participant's life, the interventionist should begin to introduce negative stress as its counterpart. Similar to the discussion of positive stress, the participant should first get an opportunity to share his/her knowledge about the topic.

**Script 19:** *The other side of moderate stress is the negative kind. How would you describe a moderate level of negative stress?*

The participant profiles for negative stress mirror those provided for positive stress. When a profile is introduced without a description, refer to the profile descriptions given for positive stress to determine which best fits for the participant.

Correct information profile. (Description on page 8, script 15)

**Script 20:** *You're exactly right! A moderate level of negative stress could make it difficult to focus or make progress toward a goal. What does that look like when it happens to you?*

Incomplete or incorrect information profile. The participant may begin to describe stress that is characteristic of a high level rather than a moderate level at this point. Listen carefully for any mention of health-related complications due to stress, as these go beyond the characteristics of moderate stress. The interventionist should affirm the participant's effort and provide corrective feedback prior to soliciting examples.

**Script 21:** *I'm glad that you're already thinking about how stress can impact your health! We'll talk more about that in just a bit. When it comes to moderate stress though, the impact tends to be more mental, such as feeling overwhelmed by your responsibilities for something. What examples come to mind for when you've been overwhelmed?*

No information profile. (Description on page 9, script 17)

**Script 22:** *It can be tough to know exactly what a moderate amount of negative stress looks like. Most of the time, this is the kind of stress you're under when you feel overwhelmed or like things aren't manageable for you. Tell me about a time when you felt like you were in over your head on something.*

Regardless of the profile used, allow for the participant to share an example of how he/she has experienced a moderate amount of negative stress. If the participant begins to describe an event that is specific to cannabis use, allow him/her to finish describing the event without interruption. Remember that any attempt by the participant to discuss cannabis use should be redirected to the topic of stress. Therefore, the interventionist's reply should emphasize the experience of stress without further discussion of cannabis. The following script provides an example of how to acknowledge the participant's experience while mitigating the potential for additional discussion of cannabis.

**Script 23:** *It sounds like you were hitting several of the signs that come up for negative stress. I noticed that some of what you're talking about might fit better in the next part that we will cover. Let's talk through that and see what you think.*

Next the interventionist introduces high levels of stress as the final component of this stage in the intervention. High stress is characterized as unhealthy and associated with problems with physical health. The focus on physical health is the key feature used to distinguish high

stress from moderate negative stress. The same format used to introduce and discuss other types and levels of stress should be used here (e.g., elicit participant knowledge, provide feedback, solicit an example).

**Script 24:** *As you might have guessed by now, the last level of stress that we'll talk about is high stress. What can you tell me about high stress?*

An appropriate alternative or follow-up question:

*How would you know if you're experiencing high stress?*

Correct information profile. A participant belongs in this profile if his/her response is primarily composed of information about the negative impacts of stress on health. The response does not need to include specific examples of negative health outcomes to fit within this profile. The following script provides an example of how to respond to a nonspecific participant statement about physical health being affected by high stress.

**Script 25:** *Exactly! High stress can lead to a lot of different health problems. What are some that you have experienced when under this kind of stress?*

Incomplete or incorrect information profile. Any participant who provides information that is not centered on the physical health problems associated with stress fits within this profile. Participants who describe higher severity symptoms which extend from moderate negative stress also fit this profile, as the information he/she provided is incomplete (e.g., not including physical symptoms). If the participant provides accurate information that is not based on physical health, an affirmation based on his/her knowledge may be used. However, if the participant provides incorrect information, an affirmation about effort should be used.



**Script 26:** *You're definitely right about the problems focusing becoming much worse with high stress. Something that is unique to high stress is the physical health problems that can come up. What can you tell me about how stress affects physical health?*

If the participant is unable to provide examples of physical health symptoms that are caused by high stress, proceed to script 26.

No information profile. This profile is for participants who are unfamiliar with the negative impacts of high stress on physical health. Although a participant may immediately fit within this profile when beginning to discuss high stress, interventionists may arrive at this profile after attempting to provide corrective feedback based on incomplete or incorrect information.

**Script 27:** *The key feature that sets high stress apart from the lower levels is how it can negatively impact your physical health. This can show up in lots of ways like sleep and appetite disturbances, or even lowered immune system functioning. What kinds of changes in your health have you noticed when you were feeling a lot of stress?*

If the participant offers an example of how high stress manifests for him/her, allow for a brief discussion of it without talking about how it relates to cannabis. After discussing the participant's experience of high stress symptoms, proceed to the second stage of the session.

## **Part 2: The "Four A's"**

Estimated time: 25 minutes

In the second stage of the session, the interventionist teaches the participant about several coping and stress reduction strategies recommended by the Mayo Clinic. The strategies, Avoid, Alter, Accept, and Adapt, are known as the "Four A's" and are intended to begin building the participant's repertoire of techniques for managing stress. Throughout this stage of the manual,

each strategy is introduced individually, and the participant is given an opportunity to discuss times when he/she has engaged in them.

It is important to note that each of the “Four A’s” contains multiple variations for how they may be used. Not all strategies or variations within them will resonate for every participant. Interventionists should empower the participant to be active in the selection and discussion of components within each domain of these coping and stress reduction strategies. The next script transitions into this stage of the session and sets the structure of how the content will be presented.

**Script 28:** *The next thing we’ll talk about are some strategies for coping with and reducing stress. They all come from the Mayo Clinic, which is a nonprofit medical organization. The four strategies they recommend are called the “Four A’s” and include: avoid, alter, accept, and adapt. As we go through them, we can talk about what parts seem most relevant for you. How does that sound?*

### **Avoid**

The first strategy from the Mayo Clinic is to avoid stress. This can be approached in four ways: controlling the setting, reducing contact with bothersome people, saying no, and prioritizing items. In the paragraphs that follow, a brief description of each strategy is provided with an accompanying script demonstrating how it may be incorporated into the session. To facilitate active participant engagement, interventionists should begin this portion of the session by opening a dialogue about the different variations of the “avoid” strategy.

**Script 29:** *The first strategy is to avoid stress. Since that idea is fairly broad, let’s talk about a few specific ways you can go about doing it. We can talk through all of them or spend more time on the ones that seem most useful to you. The four ways the Mayo Clinic*

*describes “avoid” are: controlling your setting, reducing contact with people who bother you, saying no, and prioritizing items. Where would you like to start?*

Controlling the setting. This approach to avoidance requires prior knowledge about a situation which typically provokes stress in a person. To use it effectively, the participant will need to have the ability to make an alternative plan which prevents him/her from entering the stressful situation.

**Script 30:** *There are lots of ways you can take control of what happens around you. For instance, if you know that traffic is really bad on your usual route to work, you might consider leaving at an earlier time or taking a longer route with less traffic. What part of your routine has a bottleneck like this?*

Reducing contact. This strategy is likely to be most useful for participants who report being stressed by his/her interactions with certain people. The goal is to minimize the amount of interaction as much as possible with the person(s) who provoke stress for the participant. Suggestions can range from sitting on the opposite side of the room to not attending something altogether. As such, the interventionist should use his/her judgment in tailoring the degree of separation feasible for the participant when discussing this strategy.

**Script 31:** *One of the best ways to go about reducing contact with people who bother you is by increasing the distance between you. This can be physical distance or even mental distance, like putting on headphones to make them less noticeable. Where do you see this fitting in with the people who create stress for you?*

Saying no. This strategy involves recognition of responsibilities that are extraneous to the participant’s life. It primarily serves to prevent additional stressors from affecting him/her.

**Script 32:** *It can be challenging to refuse to take on additional responsibilities when you want people to see you as nice or charitable. Saying “no” is a useful skill to help keep yourself from having your kindness get taken advantage of. How often do you find yourself taking on responsibilities that you don’t really want?*

Prioritizing items. This strategy is designed to reduce or eliminate the number of things the participant reports being stressed from. It addresses the stressors which are already present but may be causing undue stress because of the little importance they carry.

**Script 33:** *Making lists of things based on how important they are can help you sort out what needs to get done and what can wait. When you think about your responsibilities, what comes up as most important? How about least important?*

### **Alter**

The second strategy for stress reduction is to alter the situation. According to the Mayo Clinic, this may be accomplished in four ways: changing behavior, communicating feelings, time management, and stating limits. Each of these is described and demonstrated below.

**Script 34:** *This next strategy is about altering situations which are stressful to you. Like the last one, it also consists of four types: changing behavior, communicating feelings, time management, and stating limits. Which of those would you like to start with?*

Changing behavior. This strategy involves the participant being willing to both ask others to change their behavior and to adjust his/her own reactions. It is typically useful for preventing relatively minor stressors from evolving into larger ones.

**Script 35:** *Though it can be intimidating to ask someone to change how they treat you or act around you, it can also help prevent those things from snowballing and getting worse. When you notice these things happening, it’s also helpful to think about what you can do*

*differently that might affect how someone is responding to you. Think about a time when someone did something minor to cause you stress. What did you say to them about it?*

Follow-up questions:

*How did they react?*

*What would you say to them if it happened to you now?*

*What could you have done differently to keep that from happening?*

Communicating feelings. In this version of altering the situation, the interventionist introduces the potential usefulness of using “I” statements to effectively communicate feelings in a non-accusatory manner. These are intended to help the participant inform another person of his/her needs and develop a mutually agreed upon solution.

**Script 36:** *Working on how you approach telling someone how something is causing you stress is another way to alter the stress in your life. Since this involves telling them how you feel, using “I” statements can help set up a conversation that is less likely to feel like an accusation. For example, “I feel overwhelmed when deadlines are short” is easier to hear than “You need to give me more time.” Where can you see this helping with something that is stressful in your life?*

Time management. The purpose of this strategy is to help the participant reorganize his/her approach to completing tasks. Interventionists should recommend this for participants who report having a several similar tasks throughout the day/week which can be consolidated.

**Script 37:** *Sometimes people get stressed out because they have a hard time organizing things in an efficient way. Often times, setting aside an hour or two at certain points in the week can give you the time you need to keep things organized. What are some smaller*

*stressors that tend to build up for you? How might you go about consolidating some (or all) of them?*

Stating limits. In this final variant of altering situations, the interventionist introduces an approach toward identifying boundaries that mitigate the participant's exposure to stressful experiences. These limits are identified upfront by the participant in his/her daily life.

**Script 38:** *Another way to think about stating your limits is to consider them your boundaries. Setting firm boundaries can prevent or manage a great deal of stress that would show up without them. What kinds of limits have you set in the past to help control stress?*

### **Accept**

Acceptance of stressors is the third strategy suggested by the Mayo Clinic. The versions of acceptance include speaking with others, practicing forgiveness, positive self-talk, and learning from mistakes. The strategies for acceptance of stressors are best suited for use with participants who lack the ability to make lasting or meaningful changes to stressors in his/her environment. The interventionist should present them as coping strategies which require practice to maximize effectiveness.

**Script 39:** *The third strategy is acceptance, which is useful when coping with stressors that you might not have the ability to change. Just like the last two, it has four versions we can choose between as well: speaking with others, practicing forgiveness, positive self-talk, and learning from mistakes. Where would you like to start with those?*

Speaking with others. This version of acceptance involves seeking help from friends or family members for validation and support. For this strategy to be effective, the participant must first be

able to identify a support person who will be understanding and nonjudgmental of his/her experience.

**Script 40:** *Take a second to think about one person you can go to for support. [pause]*

*One way you can process a stressful experience is to reach out to that person and talk about it. Even though it doesn't take away the stressor, it can greatly reduce the amount of stress felt by it. What has your experience been like trying to talk to others about stress?*

Practicing forgiveness. When introducing the forgiveness strategy, interventionists should emphasize the tendency for negative emotions to reinforce themselves, resulting in greater levels of stress. Some participants may respond better to alternative phrasing, such as “letting things go” or “shrugging it off” when discussing this topic.

**Script 41:** *When it comes to forgiveness, it can be hard to break the cycle of negative emotions that tend to make feelings of stress worse. The more you practice letting go of those things, the less you'll be pulled into that cycle. What's your experience been like with this?*

Positive self-talk. The focus of this version of acceptance is for participants to maintain objectivity in response to a stressful situation. This serves to mitigate the snowball effects of catastrophizing small stressors into larger ones.

**Script 42:** *A lot of people tend to talk down to themselves when they are stressed out, especially if they feel like it's their fault. The problem with that is it only makes them feel worse. On the other hand, saying something compassionate or positive to yourself can help lighten the stress. When you feel stressed out, what kinds of things do you usually*

*say to yourself? What do you think your best friend would say to you in that same situation?*

Learning from mistakes. This type of acceptance is intended to emphasize the value of teachable moments for the participant. Interventionists should ask participants to reflect on a time when he/she learned a valuable lesson after a stressful experience and encourage him/her to apply that mindset to present sources of stress.

**Script 43:** *It's important to be able to learn from mistakes despite how hard we can be on ourselves for making them. Think back to a time when you felt stressed out over a mistake you made and what you were able to learn from it. How does your ability to see the value of those past lessons affect how you feel about making mistakes now?*

### **Adapt**

The final strategy covered in the session involves adapting to stress. The Mayo Clinic provides six approaches toward adapting: adjusting standards, thought-stopping, reframing, adopting a mantra, practicing gratitude, and thinking about the big picture. Adapting to stress should be presented to the participant as adjusting the expectations he/she has about the role of stress in his/her life.

**Script 44:** *The last of the "Four A's" is adapting to stress. This one has six different versions that we can talk about. They are adjusting standards, thought-stopping, reframing, adopting a mantra, practicing gratitude, and thinking about the big picture. Which of those would you like to talk about first?*

Adjusting standards. In this version of adapting to stress, participants are encouraged to let go of the perception that he/she must obtain the ideal outcome to be considered successful at



something. Interventionists can introduce this as allowing for flexibility in an otherwise rigid structure of expectations or simply as allowing oneself to be good enough.

**Script 45:** *It's common for people feel a lot of stress because of the pressure they put on themselves. They think they have to live up to the ideal version of themselves all the time, when they can give themselves some wiggle room. How often do you think this is the case for you?*

Thought-stopping. Engaging in thought-stopping directly prevents progression of negative thoughts which evoke stress in the participant. Interventionists should only discuss how thought-stopping can be used in direct relation to stress or the emotions which evoke stress.

**Script 46:** *Thought-stopping is the idea that when you have a negative thought which stresses you out, you refuse to let it progress. For example, you can practice saying "no" to your thoughts when you notice the ones that cause you stress. What do you make of that?*

Reframing. With this approach, the interventionist encourages the participant to consider a stressful situation from another point of view. The goal is to identify positive aspects of stressful situations and emphasize their benefits.

**Script 47:** *When people feel stressed out, we tend to only look at things from the point of view that coincides with feeling that way. Trying a different perspective, or reframing the way we look at things, can help us see a silver lining. When have you had a situation where taking a second look made you feel differently about it?*

Adopting a mantra. This approach is designed to help the participant identify an encouraging word or phrase to help him/her overcome stressful situations. Interventionists can offer

suggestions but should encourage the participant to select a word or phrase that carries substantial meaning for him/herself.

**Script 48:** *Having a saying that calms you down when your stress is high can help to de-escalate the negative emotions. What do you say to yourself when you notice stress coming up?*

Practicing gratitude. This involves thinking about the positive aspects of a person's life.

Interventionists should encourage participants to develop and maintain a list of the things in life that bring him/her joy (e.g., vacations, friends/family, home, etc.).

**Script 49:** *Reminding ourselves of the things we enjoy about our lives can help balance out the negative pull that we get from stress. How do you remind yourself of positive things when you're feeling stress?*

Thinking about the big picture. Consideration of how a stressful situation compares against the grand scheme of a person's life can alter the perception of a stressful event. When discussing this approach toward adapting to stress, interventionists should encourage participants to evaluate the long-term significance of a current stressor.

**Script 50:** *It can be easy to get hung up on how everything feels in the moment when stress is high. Taking a step back to think about the long-term impact of it is one way to help control it. When you think about what stresses you out right now, how much do you think those things will affect you one year from now?*

Reminder: Not all the strategies listed are likely to be effective for all people.

Interventionists should employ his/her judgment along with participant feedback throughout the session to select the most appropriate strategies for discussion.

Cannabis-related responses. The participant may respond to any of the preceding scripts with scenarios specific to cannabis use. Although not all possible responses can be accounted for, the following script provides examples for how to redirect the conversation back to stress.

**Script 51:** *I'm curious about other areas where you've been experiencing stress.*

*Where else has stress been showing up for you?*

### **Part 3: Coping Strategies**

Estimated time: 10 minutes

The final stage of the session is to develop a list of personalized coping strategies for the participant. Not all strategies need to be related to content discussed in the session. However, at least one component from earlier stages in the session should be discussed. There are two ways interventionists may approach including prior session content in the development and review of personalized coping strategies. First, participants may choose to adopt a coping strategy discussed during the “Four A’s” stage of the session (referred to as the “Four A’s profile”). Interventionists faced with the Four A’s profile may also choose to relate information from the “Levels of Stress” stage. Doing so is optional for this profile, as the information carried over from the “Four A’s” stage satisfies the requirement to review prior session content.

The second profile covers participants who prefer to create coping strategies not discussed during the “Four A’s” stage of the session (referred to as the “Levels of Stress profile”). In this profile, interventionists should primarily rely on information from the “Levels of Stress” stage while incorporating prior session content because this material is more broadly applicable. However, this does not preclude interventionists from using other session content when it appears relevant. The approach taken by the interventionist to include prior session content will depend on what strategies the participant identifies as personally relevant or useful.

The following script introduces the final stage and is followed by the profiles described above and an approach to engaging the participant.

**Script 52:** *The last part of our work together today is to make a list of personalized coping strategies that will be effective for you when you're feeling stressed. We can include any of the ones we already talked about in here today, but we don't have to. Remember, these are your strategies, so you are ultimately in charge of what goes on the list. What ideas do you have about it?*

Participants who appear indecisive or unsure about how to begin building a personalized list of coping strategies may require additional support and direction. The following script is designed assist the interventionist in orienting the participant toward one of the profiles described in the introduction to this stage (e.g., Top-down and Bottom-up). These participants are likely to expect the interventionist to provide a sense of direction. Instead of taking full control of the remainder of the session, it is more appropriate to provide options that support the participant's autonomy in choosing his/her own strategies.

**Script 53:** *There are lots of ways we can come up with coping strategies. It might be helpful to think about what we've talked about in here today. We can use some of the strategies we talked about with the Four A's to get us started or we can look back to the levels of stress to come up with something more unique. Which sounds better to you?*

Top-down profile. This approach is used for participants who choose to adopt strategies based on those discussed during the "Four A's" stage of the session. It is considered "top-down" because it takes an established coping strategy and applies it to the situation/stressor the participant is experiencing. Interventionists should continue to support participant autonomy by encouraging him/her to lead the selection of strategies. This may be accomplished by reflecting

on any strategies from the “Four A’s” that the participant demonstrated interest in earlier in the session. Interventionists may also find it helpful to note similarities between a strategy chosen by the participant and others listed.

**Script 54:** *Let’s look back at some of the strategies we talked about. Earlier it sounded like you really liked [coping strategy]. What makes that strategy stand out? What else jumps out at you here?*

AND/OR

*You mentioned liking the “prioritizing items” strategy when we talked about it. It seems like that might have some things in common with “time management” too. What do you think about that?*

Bottom-up profile. This approach is used for participants who prefer to create his/her own strategies. It is considered “bottom-up” because it first considers the experienced stress of the participant and builds a strategy to address it. The interventionist’s role in this profile is to make relevant connections between the participant’s strategies and information from the “Levels of Stress” stage. References to the “Four A’s” may also be used but should only be done to support participant creativity or by participant request. Open-ended questions and affirmations are highly encouraged for this profile.

**Script 55:** *It seems like you have a good idea about what works for you to de-stress.*

*What makes \_\_\_\_\_ effective for you?*

*What strategies come to mind for things that are on a higher level of stress?*

*How can you incorporate some of these into your routines?*

Finally, it is possible for participants to fall into both the top-down and bottom-up profiles during this stage of the intervention. In these cases, interventionists should alternate

approaches to be congruent with the participant using the scripts provided for each profile. There is no set limit for coping strategies, however a minimum of one must be discussed prior to session conclusion.

### **Session Conclusion**

#### **Estimated time: 2-3 minutes**

After all stages of the intervention are complete, the interventionist has several important administrative procedures to complete. These include thanking the participant, reminding him/her about the follow-up survey and incentive, informing the participant that he/she is entitled to receive the Motivational Enhancement Therapy/Cognitive Behavioral Therapy condition when contacted about the follow-up survey, and providing referrals to follow-on services when necessary (e.g., participant expressed risk).

**Script 56:** *I want to thank you again for your participation today! I hope the strategies we talked about are useful for you. I encourage you to keep the sheet with your personalized strategies somewhere easy to find in case you ever need it. There are a couple quick reminders I'd like to give you. First, you'll be contacted in about one-month regarding our follow-up survey. We offer a \$10 Amazon gift card for participating in it, so please keep an eye out for that email. Secondly, when you receive that follow-up email, you are also entitled to receive a session of Motivational Enhancement and Cognitive Behavioral Therapy for cannabis use at no cost to you. You'll be asked whether you're interested in that when you receive that follow-up survey, so you have some time to think about it. Do you have any questions before you go?*

In rare instances, a participant may disclose information which warrant additional psychological services (e.g., expressing risk). In these cases, the interventionist should encourage

him/her to seek follow-up with a higher level of care using the list of referral resources. This should be approached as if it is part of the standard session protocol.

**Script 57:** *Based on what we talked about when you said \_\_\_\_\_, you might want to talk to someone at the (Psychological Services Center or Health Network). I have the contact information here.*

All participants can be referred to the Psychological Services Center for individual counseling. For participants who are affiliated with Colorado State University, the Health Network can be provided as an additional referral resource.

#### Alternate Session Conclusion

The following script is only intended for use with participants who choose not to participate in the HSM protocol after being given the choice between that and the CST condition.

**Script 58:** *I'll need a few minutes to prepare things for us. Let's take a quick break for about five minutes while I get things set up. I'll let you know when we are ready to begin.*

Proceed to script 1 of the CST manual.

## LIST OF ABBREVIATIONS

1. ANCOVA – Analysis of Covariance
2. BPSM – Biopsychosocial Model
3. CAC III – Certified Addiction Counselor III
4. CBT – Cognitive Behavioral Therapy
5. CP – Change Plan
6. CPQ – Cannabis Problems Questionnaire
7. CST – Cannabis Specific Treatment
8. DB – Decisional Balance
9. HSM – Healthy Stress Management
10. LAC – Licensed Addiction Counselor
11. MDB – Marijuana Decisional Balance
12. MET – Motivational Enhancement Therapy
13. MI – Motivational Interviewing
14. PSS – Perceived Stress Scale
15. SDS – Severity of Dependence Scale
16. SMART – Specific, Measurable, Achievable, Realistic, Timed
17. TLFB – Timeline Followback
18. TTM – Transtheoretical Model