The Application of Mindfulness for Interpersonal Dependency:
Effects of a Brief Intervention

A thesis presented to
the faculty of
the College of Arts and Sciences of Ohio University

In partial fulfillment
of the requirements for the degree
Master of Science

Andrew S. McClintock

December 2012

© 2012 Andrew S. McClintock. All Rights Reserved.

This thesis titled
The Application of Mindfulness for Interpersonal Dependency:
Effects of a Brief Intervention

by

ANDREW S. MCCLINTOCK

has been approved for
the Department of Psychology
and the College of Arts and Sciences by

Timothy M. Anderson

Associate Professor of Psychology

Robert Frank

Dean, College of Arts and Sciences

ABSTRACT

MCCLINTOCK, ANDREW S., M.S., December 2012, Psychology

The Application of Mindfulness for Interpersonal Dependency:

Effects of a Brief Intervention

Director of Thesis: Timothy M. Anderson

This study examined the efficacy of a brief mindfulness intervention for alleviating the affective consequences of interpersonal dependency. Seventy undergraduate students with high trait dependency underwent a mood induction to exacerbate the core cognitive and affective features of interpersonal dependency. Participants were then randomly assigned to listen and participate in a 20-minute recording of either a mindfulness treatment or a distraction (control) treatment. Relative to those in the distraction group, mindfulness group participants reported greater increases in state mindfulness and greater reductions in state anxiety and state negative affect. Mediation analyses supported the notion that the decentering facet of state mindfulness fully mediated the improvements in both state anxiety and state negative affect. The findings of this study evince that mindfulness training may be a beneficial adjunct for treating interpersonal dependency and possibly dependent personality disorder.

I dedicate this thesis to my parents

ACKNOWLEDGMENTS

I would like to express appreciation to my committee members, Dr. Tim Anderson, Dr. Brook Marcks, and Dr. Justin Weeds, for their commitment and regular guidance during this process. I particularly want to thank my advisor, Tim, for spurring my research interests. I also appreciate Dr. Robert Bornstein's contributions to this study, especially his help in designing the dependency-mood induction. Finally, I'd like to recognize the support of my parents, who couldn't have done more.

TABLE OF CONTENTS

	Page
Abstract	3
Dedication	4
Acknowledgments	5
List of Tables	7
Chapter 1: Introduction	8
Interpersonal Dependency	9
Mindfulness	13
Applying Mindfulness for Interpersonal Dependency	16
Chapter 2: Method	21
Participants	21
Measures	22
Procedures	28
Chapter 3: Results	32
Demographic and Baseline Mental Health Data	32
Manipulation Check	32
State Mindfulness by Treatment Group	33
State Mood Measures by Treatment Group	34
Mediation Analyses	35
Chapter 4: Discussion	38
References	44
Appendix A: Self-Statements in Dependency Induction	65
Appendix B: Neutral Ideas in Distraction Condition	66

LIST OF TABLES

	Page
Table 1: Percentages/Mean (and Standard Deviations) for Demographic and Baseline Mental Health Data According to Treatment Group.....	60
Table 2: Means (and Standard Deviations) for State Anxiety and State Negative Affect over Three Administrations According to Treatment Group	61
Table 3: Regression Analyses for Treatment Group Predicting State Mindfulness, State Anxiety, and State Negative Affect	62
Table 4: Hierarchical Regression Analyses for State Curiosity (Mindfulness) Predicting State Anxiety and State Negative Affect.....	63
Table 5: Hierarchical Regression Analyses for State Decentering (Mindfulness) Predicting State Anxiety and State Negative Affect.....	64

CHAPTER 1: INTRODUCTION

Interpersonal dependency is a personality trait characterized by a need to obtain and maintain supportive relationships (Bornstein, 2005). Excessive forms of dependency have pernicious effects on an individual's social life, career, and romantic relationships (Bornstein, 2005). Dependency is also associated with an elevated risk for developing a host of Axis I disorders, including depression (Nietzel & Harris, 1990; Overholser, 1990) and anxiety disorders (Stewart, Knize, & Pihl, 1992). Additionally, high levels of dependency are linked to dependent personality disorder, a chronic, debilitating condition that is among the most frequently encountered personality disorders in mental health settings (American Psychiatric Association [APA], 2000).

Despite the clinical problems associated with interpersonal dependency, the field has yet to develop sufficiently efficacious treatments in this area (Bornstein, 2004). The limited efficacy of existing therapies, coupled with the multifaceted nature of dependency, suggests a growing need for novel treatment approaches (Bornstein, 2004). One potential approach is to integrate mindfulness (i.e., non-judgmental attention of present moment experience; Kabat-Zinn, 1994) into therapies for interpersonal dependency and dependent personality disorder. As will be discussed, there are many reasons to believe that mindfulness training could reduce interpersonal dependency problems. This application of mindfulness for interpersonal dependency, however, has not been studied empirically.

Interpersonal Dependency

Although its expression can fluctuate across time and situations, interpersonal dependency is most typically conceptualized as a fairly stable personality trait that affects functioning from childhood to old age (Bornstein, 2005). Contemporary trait models emphasize the ubiquity of dependency, in that it is present to some extent in most if not all people (Overholser & Freiheit, 1994). Accordingly, dependency is thought of as a continuous dimension, with various levels of phenotypic behavioral expression (Bornstein, 1994; Pincus & Wilson, 2001). Extreme variants of high or low dependency are associated with psychopathology, as both can have noxious effects (Bornstein, 1994).

A general consensus regarding the nature of maladaptive dependency has emerged in the literature (Bornstein, 2005; Birtchnell, 1988; Pincus & Gurtman, 1995). This consensus is most discernibly captured by Bornstein's (1992) model, which served to integrate previous theories of dependency, including cognitive-behavioral, psychodynamic, culture-based, and trait-based models. The dependency literature is replete with references to Bornstein's (1992) model, and it is perhaps the most prevailing, comprehensive conceptualization of dependency.

Bornstein (2006) defines dependency as a multifaceted personality trait wherein individuals are "predisposed to seek guidance, help, and support from others, even in situations where they are capable of functioning autonomously and meeting challenges on their own" (p. 110). According to Bornstein's (1992) pantheoretical model, dependency is comprised of cognitive, motivational, behavioral, and affective features. These four features are common to other theoretical conceptualizations of dependency

(e.g., Blatt, D’Afflitti, & Quinlan, 1976; Millon, 1990; Overholser & Fine, 1994; Pincus and Gurtman, 1995) and are empirically supported as central to an interpersonal dependency orientation (e.g., Birtchnell, 1988; Bornstein et al., 1996; Bornstein et al., 2005; Overholser & Freiheit, 1994; Shilkret & Masling, 1981; Zuroff & Mongrain, 1987). These features and how they interact with one another will be explained here to elucidate the nature of trait dependency and to provide a foundation for how mindfulness could help.

With regard to predominant cognitions, dependent individuals view themselves as powerless and ineffective, whereas others are perceived to be comparatively strong and powerful (Bornstein, 1992). This core belief that one is fragile, weak, and inept is referred to as the *helpless self-schema*. Activation of this *helpless self-schema* is thought to intensify the other components of dependency (Bornstein, 1992).

The driving motivation in dependency is to obtain and maintain relationships and to seek interpersonal support, guidance, and approval (Bornstein, 1992). In this way, dependent individuals seem to lack autonomy (Bornstein, 1994); rather than be directed by their own beliefs and values, dependent individuals are highly motivated to look to external cues to determine how to think, feel, and behave.

Individuals with dependency traits often engage in frantic behaviors, known as *relationship-facilitating self-presentation strategies*, to strengthen relationships with potential nurturers and caretakers (Bornstein, 1992). For instance, dependent individuals frequently resort to help and reassurance-seeking, supplication, yielding, and even intimidation to maintain relationships and avoid abandonment.

Finally, fears of rejection and abandonment are common affective responses that, like the *helpless self-schema*, seem to underlie the other features of dependency (Bornstein, 1992). That is, fears of abandonment can activate the *helpless self-schema* and galvanize maladaptive motivations and behavior, thus producing feedback loops that increase dependency-related responding. In tandem with persistent fears of abandonment, dependent persons experience intense anxiety and depression in performance situations and when required to function autonomously (Bornstein, 2005).

As elucidated here by Bornstein's (1992) model and by others (e.g., Blatt et al., 1976), interpersonal dependency is highly related to anxiety and depression; between 10 to 20 percent of the variance in anxiety and depression scores can be accounted for by dependency (Bornstein, 1992; Overholser & Freiheit, 1994; Huprich et al., 2004). Additionally, research implies that trait dependency is a risk factor for, and is often comorbid with, anxiety and depressive disorders (Nietzel & Harris, 1990; Overholser, 1990; Stewart, Knize, & Pihl, 1992). In combination with this relationship to anxiety and depression, interpersonal dependency is linked to dependent personality disorder (DPD).

DPD is classified among the Cluster C (i.e., anxious or fearful) personality disorders in the *Diagnostic Statistical Manual of Mental Disorders-4th edition-Text Revision* (DSM-IV-TR; APA, 2000). The essential feature of DPD is "a pervasive and excessive need to be taken care of that leads to submissive and clinging behavior and fears of separation" (APA, 2000, p. 725). DPD is one of the most common personality disorders in mental health settings (APA, 2000), with a prevalence rate of over 15% among psychiatric inpatients (Bornstein, 2005). Although useful information is lost

when a continuous dimension of personality is converted to a dichotomous category (Widiger, 1993), a DPD diagnosis provides a shorthand summary of a client's dependency-related difficulties (Bornstein, 2005). That is, DPD represents the especially severe and abnormal expressions of trait dependency (Pincus & Wilson, 2001). Not only do clients diagnosed with DPD tend to score high on measures of dependency (Bornstein, 1994; Loas et al., 2002), but also the symptomatology of DPD (APA, 2000) overlaps considerably with Bornstein's (1992) conceptualization.

Given the documented associations between interpersonal dependency and anxiety, depression, and DPD, it would be prudent to develop empirically supported treatments for this maladaptive personality trait. The empirical literature on treatments for dependency, however, is underdeveloped; there is, at present, a lack of evidence supporting the efficacy of current interventions. Most of the extant research has centered on the effects of psychodynamic and cognitive-behavioral approaches. Researchers have reported small positive effects (e.g., $d = 0.19$) in clinical trials of time-limited (Alexander & Abeles, 1968) and long-term (Blatt, 1992, Blatt & Ford, 1994) psychodynamic therapies for dependent clients with comorbid diagnoses. To the author's knowledge, six studies have explored the effectiveness of cognitive-behavioral treatments for dependency, with three reporting significant results (Borge et al., 2010; Nelson-Gray et al., 1996; Rathus et al., 1995) and three reporting nonsignificant findings (Black et al., 1996; Moore & Blackburn, 1996; Rector et al., 2000).

Bornstein (2004) summarizes the effectiveness of current treatments for dependency as "modest" (p. 294). The dearth of sufficiently efficacious treatments for

dependency underscores the need for developing alternative strategies. Recent theory and research provides the rationale for the integration of mindfulness-based techniques with existing treatments for interpersonal dependency to improve the efficacy and clinical significance of such approaches.

Mindfulness

A widely embraced definition of mindfulness is “paying attention in a particular way: on purpose, in the present moment, and non-judgmentally” (Kabat-Zinn, 1994, p. 4). Mindfulness refers to the intentional self-regulation of attention on immediate, moment-to-moment experience (Bishop et al., 2004). The quality of this attention is characterized by compassion, acceptance, and curiosity (Bishop et al., 2004; Kabat-Zinn, 2005). Mindfulness is typically cultivated through formal meditation practices, which are systematic techniques for brining present-moment, non-judgmental attention to a specific aspect of one’s experience (e.g., the breath, sensations, thoughts, or emotions).

Interventions that employ mindfulness as a therapeutic technique have been recently developed. These mindfulness-based interventions, which are typically delivered over several weeks, aim to enhance the client’s awareness and *acceptance* of thoughts and other internal experience. This contrasts with traditional cognitive-behavioral therapies that aim to *modify* the thoughts themselves (Carmody, Crawford, & Churchill, 2006; Jazaieri & Shapiro, 2010).

Of the mindfulness-based interventions, dialectical behavior therapy (Linehan, 1993), acceptance and commitment therapy (Hayes, Strosahl, & Wilson, 1999), mindfulness-based stress reduction (Kabat-Zinn, 1982), and mindfulness-based cognitive

therapy (Segal, Williams, & Teasdale, 2002) have received the most empirical attention and support for their efficacy. Research indicates that mindfulness-based interventions are effective at treating a wide variety of psychological problems (Baer, 2003), most notably anxiety (Goldin, Ramel, & Gross, 2009; Roemer, Orsillo, & Salters-Pedneault, 2008; Twohig et al., 2010), depression (Forman et al., 2007; Hofman et al., 2010; Ma & Teasdale, 2004), and borderline personality disorder (Kliem, Kroger, & Kosfelder, 2010; Linehan et al., 2006; Verheul et al., 2003).

Research has also investigated the impact of brief (i.e., one hour or less) mindfulness interventions. Data indicates that a brief meditation exercise increases state mindfulness and is significantly more effective at alleviating state distress than an active control condition (Arch & Craske, 2006; Broderick, 2005; Zeidan et al., 2010b). Zeidan, Gordon, and Goolkasian (2009) discovered that individuals who participated in one hour of mindfulness meditation training, in comparison to active controls, reported less anxiety and pain. A similar training regimen reduced anxiety and fatigue, while enhancing working memory and executive functioning, compared to a group that listened to an audiobook (Zeidan et al., 2010a).

Broderick (2005) examined the efficacy of a brief meditation exercise for reducing state negative affect. At the beginning of the study, negative mood was induced in all participants by having them listen and read along with a series of unpleasant self-statements (e.g., “I have too many bad things in my life”). Next, participants were randomly assigned to a mindfulness, rumination, or distraction condition. Those in the mindfulness condition engaged in an 8-minute audiotaped meditation. Participants in the

rumination condition were asked to contemplate self-focused statements (e.g., “why you react the way you do”), whereas those in the distraction condition reflected on neutral ideas (e.g., “a freshly painted door”). As predicted, participants instructed to meditate reported significantly greater reductions in negative affect on the Positive and Negative Affect Schedule (Watson, Clark, & Tellegen, 1988) than those in either of the two other conditions. The results of this and similar studies demonstrate the salubrious effects of mindfulness meditation, even for relatively brief interventions.

In combination with this efficacy research, empirical attention has been devoted to understanding how mindfulness leads to therapeutic change. Of all the mediating mechanisms in the mindfulness literature, decentering has arguably garnered the most favor; some researchers (Sauer & Baer, 2010; Shapiro et al., 2006) describe decentering as a ‘meta-mechanism’ within mindfulness.

Decentering refers to a rotation in perspective that occurs through mindfulness practice, whereby one is able to disengage from the content of consciousness (e.g., thoughts and feelings) and observe moment-to-moment experience with greater objectivity (Shapiro et al., 2006). That is, a thought can be recognized in the moment as simply a thought; one can watch what the mind says, rather than be dictated by it (Luoma, Hayes, & Walser, 2007). This shift from personally identifying with, to a broader and more spacious awareness of, thoughts and feelings seems to be integral to what makes mindfulness work (Lau et al., 2006; Teasdale et al., 2002). Research indicates that scores on decentering measures increase following intensive mindfulness training (Lau et al., 2006; Orzech et al., 2009). Lau and colleagues (2006) found that

increases in decentering from pre- to post- an 8-week mindfulness intervention significantly predicted reductions in both stress and psychopathology symptoms.

In summary, mindfulness-based interventions are effective at treating a host of psychological problems, including chronic, personality-based conditions (e.g., borderline personality disorder). Research has also demonstrated that brief mindfulness interventions reduce anxiety and negative affect better than active control conditions. Finally, it appears that decentering is a central mechanism through which mindfulness exerts its effects.

With this in mind, it seems reasonable to suspect that a mindfulness-based intervention, even a relatively brief one, could likewise benefit those with trait dependency. The efficacy of mindfulness for interpersonal dependency, however, has not been investigated. To illuminate the rationale behind this treatment application, the literature on mindfulness and decentering will be integrated with Bornstein's (1992) model of interpersonal dependency. This conceptual integration of the mindfulness and dependency literatures should be regarded as preliminary; a considerable amount of basic and treatment research is needed to determine the validity of the hypotheses made herein.

Applying Mindfulness for Interpersonal Dependency

There are many reasons why mindfulness training may be well-suited for treating dependency-related problems. First, cultivating an accepting attitude through mindfulness may be critical for individuals struggling with relatively stable conditions, like interpersonal dependency and DPD. Benjamin and Karpiak (2001) contend that acceptance is likely to be a necessary component for successful treatment of any

personality-based pathology. It may be that change-based techniques alone are insufficient for treating the more chronic forms of psychopathology (e.g., personality disorders) because the features and symptoms of these conditions are deeply ingrained and resistant to change. Awareness and acceptance of persistent symptoms may therefore be an important adjunct to treatment. For example, dialectical behavior therapy, which combines traditional cognitive-behavioral techniques with mindfulness and radical acceptance, is considered to be the gold standard treatment for borderline personality disorder (Kliem, Kroger, & Kosfelder, 2010). Given that borderline personality disorder is a chronic condition highly related to interpersonal dependency and DPD (see Bornstein et al., 2010), it seems logical that a similar acceptance/mindfulness-based intervention would be profitable for interpersonal dependency as well.

Secondly, mindfulness could increase autonomy, a skill dependent individuals lack (Bornstein, 1994). Rather than be directed by an internal compass, dependent individuals habitually look to others to determine how to think, feel, and behave. The development of autonomy has thus been argued to be fundamental to effective dependency treatments (Bornstein, 2005; Overholser, 1997). Mindfulness may be a potent technique for building autonomy because as articulated by Kabat-Zinn (1994), mindfulness is about cultivating intimacy with oneself. It involves self-inquiry, introspection, and a sustained curiosity about what one is experiencing from moment-to-moment. By shifting attention inwardly, an individual could learn to explore, develop familiarity, and connect with one's own resources. This may allow individuals to be more independent and self-governing in their actions. Although this hypothesis has

received limited empirical attention, Leigh (2010) reported that trait mindfulness is positively correlated with autonomy and self-competence. Preliminary data for an 8-week mindfulness intervention indicated that autonomy (Carson et al., 2004) increases from pre- to post- treatment.

Thirdly, as will be tested in the current study, decentering and mindfulness appear to be particularly capable of targeting the core cognitive and affective features of interpersonal dependency. With regard to the cognitive features in Bornstein's (1992) model, dependent individuals view themselves as relatively weak, powerless, and ineffective (i.e., the *helpless self-schema*). By developing greater awareness and acceptance, dependent individuals may become less apt to overidentify with these self-perceptions. Mindfulness could help them to recognize that these thoughts are 'just thoughts,' as opposed to reflections of the self that are necessarily true (Safran & Segal, 1990). As an example, rather than think "I *am* helpless," a dependent person engaged in decentering (mindfulness) might observe, "I am thinking that I am helpless." Relating to one's thoughts in this wider field of awareness may be immensely valuable for dependent individuals and how they see themselves. Research supports the claim that mindfulness aids in disengaging from maladaptive thought patterns (Bootzin & Stevens, 2005; Chiesa & Serretti, 2009; Jain et al., 2007; Mathew et al., 2010; Ramel et al., 2004; Shapiro et al., 2008).

Mindfulness training could also enable dependent persons to better manage the affective features of dependency. According to Bornstein's (1992) model, individuals often become overwhelmed by feelings of sadness, anxiety, and fears of abandonment.

Training in mindfulness may be a valuable tool for targeting these dependency-related fears because mindfulness is thought to serve as a form of therapeutic exposure (Baer, 2003). That is, attending to the present moment via mindfulness could allow an individual to confront and experience intense emotions, allowing the affect that had been avoided to be experienced fully. Prolonged, non-judgmental observation of the feared experience may then facilitate habituation (Baer, 2003). Research shows that mindfulness-based interventions decrease emotional avoidance (Nice, 2008), while augmenting emotion regulatory processes (Arch & Craske, 2006; Brown & Ryan, 2003; Chiesa, Brambilla, & Serretti, 2010; Ortner, Kilner, & Zelazo, 2007; Tacon et al., 2003). Moreover, there is initial evidence that mindfulness mitigates the distress associated with interpersonal rejection (Creswell, Eisenberger, & Liberman, 2006; Heppner et al., 2008). This latter finding implicates the potential utility of mindfulness for specifically alleviating the intense fears of abandonment associated with dependency. Considering this body of research, it seems likely that mindfulness would also help dependent persons to relate to their emotional arousal in more adaptive ways.

Because mindfulness (decentering) appears to be a good fit for treating features of dependency, the present study was designed as an initial test of how mindfulness may benefit interpersonally dependent persons to de-escalate from high levels of cognitive and affective symptoms. To evaluate this, a variation of Broderick's (2005) methodology was employed to first exacerbate the *helpless self-schema* and fears of abandonment in a highly dependent sample. Given that anxiety and depression are intimately linked with interpersonal dependency, state measures of anxiety and negative affect were

administered at three different time points to serve as outcome variables. A brief mindfulness intervention and a distraction (active control) condition were then compared based on how well each relieved the induced distress. For reasons highlighted above, it was hypothesized that participants in the mindfulness condition would report a greater reduction in anxiety and negative affect, as compared to the participants in the distraction condition.

Another primary goal of this study was to assess the role of decentering in ameliorating the dependency-related distress. Accordingly, a state measure of mindfulness that includes a decentering subscale was administered immediately after the treatment conditions. It was hypothesized that the mindfulness condition would be superior to the distraction condition at increasing state mindfulness, as well as both its subscales (i.e., curiosity and decentering). More importantly, it was hypothesized that, for reasons highlighted above, findings would be consistent with the notion that the decentering subscale partially or fully mediated the effect of treatment group on outcome. Due to results reported by Lau and colleagues (2006), the curiosity subscale was not expected to mediate treatment gains.

CHAPTER 2: METHOD

Participants

A total of 1221 undergraduate students completed the Interpersonal Dependency Inventory (IDI; Hirschfeld et al., 1977) at a large Midwestern university to screen for high levels of interpersonal dependency. The mean (44.85) and standard deviation (14.56) of the IDI for the screened sample were similar to normative data (e.g., Bornstein, 1997). Respondents who scored at least one standard deviation above the mean on the IDI at this pre-screen (i.e., > 58.92 , as derived from Bornstein, 1997) were eligible to participate in the current study, which was advertised as an investigation of “coping skills for social problems” (mindfulness was not mentioned on recruitment documents). Eligible participants had the option of signing up for a time slot to meet with the experimenter individually at a laboratory on the university campus. Thus, participation was on a first-come, first-serve basis. Eligible participants were informed that they would receive five dollars and a course credit as compensation.

Seventy-eight undergraduate students arrived to the laboratory and completed all study procedures. However, eight participants were excluded for scoring below the normative mean on the IDI (i.e., < 45.53 , as derived from Bornstein, 1997) when assessed at the laboratory-phase of the study.¹ For these eight participants, the drop in IDI scores from higher than one standard deviation above mean at the pre-screen to less than the mean in the laboratory (the time between these assessments ranged anywhere from 24 hours to 10 weeks) may indicate that these respondents do not have enduring dependency

¹ The same pattern of results was observed even when omitting this exclusionary criterion.

traits; their data were excluded from analyses in order to maintain the integrity of a highly interpersonally dependent sample. Therefore, to be included in the final sample, participants must have scored higher than one standard deviation above the mean on the IDI at the pre-screen and higher than the mean at the laboratory assessment.

The mean age of the final sample ($N = 70$) was 19.1 years, and 90% of participants were female. Participants identified themselves as Non-Hispanic White (85.7%), Asian (5.7%), Multiracial (4.3%), Hispanic or Latino (2.9%), and African American (1.4%). More than a third of the 70 participants reported prior experience in psychotherapy, while about 17% reported practicing mindfulness at least once in the past (see Table 1).

Participants in this study also reported elevated levels of psychopathology (see Table 1). Most importantly, the sample's mean of 63.7 on the IDI was considerably higher than the normative one standard deviation above mean (i.e., 58.92, as obtained from Bornstein, 1997); about 73% of the sample scored higher than 58.92 on the IDI, thus demonstrating that as a whole, participants were exceedingly dependent. Furthermore, as compared to normative data (see Measures below), participants endorsed high levels of reassurance-seeking, fears of negative evaluation, as well as depressive, anxiety, and stress symptoms.

Measures

Anxiety (State). State Trait Anxiety Inventory- State Form (STAI-S; Spielberger, Gorsuch, & Lushene, 1970) is a widely used self-report measure of state anxiety. The STAI-S includes 20 items that are rated on a scale from 1 (*not at all*) to 4 (*very much so*). The total score was calculated by summing the 20 items (after reverse

scoring nine of the items). Scores on the STAI-S have been shown to increase from before to after a stressful event, which implies that the STAI-S reflects the influence of transient situational factors existing at the time of testing (Rule & Traver, 1983). The STAI-S is positively correlated with other measures of state anxiety (Peterson & Heilbronner, 1987) and has shown good divergent validity (Spielberger et al., 1995). In the current sample, Cronbach's α was excellent at Time 1 (.91), Time 2 (.94), and Time 3 (.93).

Negative Affect (State). The negative affect subscale of the Positive and Negative Affect Schedule (PANAS-NA; Watson, Clark, & Tellegen, 1988) is comprised of 10 items reflecting negative mood (e.g., “*upset*”). PANAS-NA assesses “subjective distress and unpleasurable engagement that subsumes a variety of aversive mood states, including anger, contempt, disgust, guilt, fear, and nervousness” (Watson, Clark, & Tellegen, 1988; p. 1063). For this study, the state version of the PANAS-NA was employed; participants were asked to indicate, “how you feel right now” on a five-point response scale from 1 (*very slightly*) to 5 (*extremely*). Summing the 10 items produces a total score, which was used in the present study. Previous research on the PANAS-NA has shown excellent convergent and discriminant validity, and that the measure is sensitive to mood fluctuations (Watson & Clark, 1997). This scale exhibited high levels of internal consistency (Cronbach's α) in the current sample at Time 1 (.90), Time 2 (.94), and Time 3 (.88).

Mindfulness (State). The Toronto Mindfulness Scale- State (TMS-S; Lau et al., 2006) is a questionnaire that assesses state mindfulness. This instrument is designed to

be administered immediately after a meditation session. It consists of 13 items, which are rated on a 6-point Likert scale ranging from 0 (*not at all*) to 5 (*very much*). A sample item is “*I experienced my thoughts more as events in my mind than as a necessarily accurate reflection of the way things ‘really’ are.*” The 13 items of the TMS-S encompass two subscales: curiosity (i.e., the motivation to learn more about one’s experience) and decentering (i.e., the shift from personally identifying with thoughts and feelings to relating to one’s experience in a wider field of awareness). These two factors have been supported by exploratory and confirmatory factor analyses (Lau et al., 2006). The total and subscale scores were calculated by taking the mean of the appropriate items. The TMS-S correlates positively with trait mindfulness and meditation experience (Ortner, Kilner, & Zelazo, 2007) and exhibits good discriminant validity (Lau et al., 2006). Scores on the TMS-S have also been shown to increase significantly following mindfulness interventions (Altmaier & Maloney, 2007; Anderson et al., 2007; Lau et al., 2006). The instructions for this measure were slightly modified to refer to the participants’ experiences when listening to the audio recording. Cronbach’s α was strong for the curiosity subscale (.90), the decentering subscale (.85), and the total scale (.91) in this study.

Mindfulness (Trait). The Toronto Mindfulness Scale- Trait (TMS-T; Davis, Lau, & Cairns, 2009) is a 13-item self-report measure of trait mindfulness, which was derived from the TMS-S. Davis and colleagues (2009) converted the TMS-S to the TMS-T by changing the wording in each item from past to present tense (e.g., “*I experience my thoughts more as events in my mind than as a necessarily accurate*

reflection of the way things ‘really’ are”). As similar to the TMS-S, items are rated on a 6-point Likert scale ranging from 0 (*not at all*) to 5 (*very much*). The TMS-T is positively associated with other self-report measures of mindfulness, and TMS-T scores are significantly higher for meditators than for nonmeditators (Davis, Lau, & Cairns, 2009). Only the total score of the TMS-T was used in this study, which is the mean of all 13 items. The scale exhibited an acceptable level of internal consistency (Cronbach’s $\alpha = .79$).

Interpersonal Dependency. The Interpersonal Dependency Inventory (IDI; Hirschfeld et al., 1977) is one of the most frequently used self-report measures of interpersonal dependency (Loas et al., 2002). The IDI contains 48 items, each of which is rated on a 4-point scale anchored with the terms *Not characteristic of me* (1) to *Very characteristic of me* (4). To compute full-scale IDI scores, an individual’s scores on the *Emotional Reliance on Others* and the *Lack of Social Confidence* subscales are added, and then from this total, their score on the *Assertion of Autonomy* subscale is subtracted (see Bornstein, 2005). Only the full-scale score was used in this study. IDI scores are positively correlated with other self-report measures of dependency (Cogswell et al., 2010; Hirschfeld et al., 1983) and predict important types of dependency-related behavior in laboratory, clinic, and field settings (Bornstein, 1995; Bornstein 1999; Bornstein & Kennedy, 1994; Hirschfeld et al., 1983). IDI scores also predict the presence and severity of DPD symptoms (Bornstein, 1994; Loas et al., 2002). Research implies that the measure has adequate discriminant validity (Bornstein, 1997; Hirschfeld et al., 1977). The IDI also has good test-retest reliability over 16-, 28-, 60-, and 84-week intervals,

with reliability coefficients (r) ranging from .74 at 16 weeks to .71 at 84 weeks (Bornstein, 1997; Bornstein, Rossner, & Hill, 1994). The mean (45.53) and standard deviation (13.39) of the IDI have been found for a large, undergraduate sample (Bornstein, 1997). A Cronbach's α of .72 was found for the IDI in this study.

Fear of Negative Evaluation. One of the most commonly employed methods for measuring fears of negative evaluation is the Fear of Negative Evaluation Scale-Brief (FNEB; Leary, 1983). The FNEB contains 12 items, with responses based on a 5-point Likert-type scale. Typical items include “*I am afraid that people will find fault with me*” and “*I often worry that I will say or do the wrong things.*” The total score, which was used in this study, is the sum of items (after reverse scoring four items). The FNEB correlates highly with the original scale ($r = .96$; Leary, 1983). A test-retest correlation coefficient of .94 was reported over a 2-week interval (Collins et al., 2005) and .75 over four weeks (Leary, 1983). Convergent validity with other measures of social anxiety and divergent validity with measures of agoraphobic avoidance have been established (Collins et al., 2005). Normative data for interpreting the FNEB is available for college students ($M = 35.7$, $SD = 8.1$; Leary, 1983). Like previous research (Collins et al., 2005), the FNEB exhibited good internal consistency (Cronbach's $\alpha = .89$) in this study.

Reassurance-Seeking. The Excessive Reassurance-Seeking Scale (ERSS; Joiner, Alfano, & Metalsky, 1992) is a 4-item self-report questionnaire assessing excessive reassurance-seeking, the relatively stable tendency to seek assurances from others that one is loveable and worthy (Joiner & Metalsky, 2001). Items on the ERSS are rated on a 7-point scale, which are added to derive a total score. The criterion and

construct validity of the ERSS have been supported by previous research (Joiner, Alfano, & Metalsky, 1992; Joiner & Metalsky, 2001). Importantly, scores on the ERSS have been shown to predict both observer-rated reassurance-seeking behavior and the development of depressive symptoms (Joiner & Metalsky, 2001). Although ERSS has been most extensively studied in the depression literature, reassurance-seeking is thought to be a core behavioral symptom of dependency and DPD (Bornstein, 2005; APA, 2000). Joiner and Metalsky (1995) reported a mean of 8.64 and a standard deviation of 3.92 for a large sample of undergraduate students. A Cronbach's α of .86 was found for the ERSS in this study.

Depression, Anxiety, and Stress. The Depression, Anxiety, Stress Scales-21 (DASS-21; Lovibond & Lovibond, 1995) is a 21-item self-report instrument that consists of three 7-item subscales. The items on each subscale are added to derive separate measures of depression, anxiety, and stress. A total score, which was also used in the present study, was calculated by summing the three subscales. Compared to the STAI-S and PANAS-NA, the DASS-21 assesses symptoms that are more stable over time (i.e., "*over the past week*"). Factor analytic studies have supported a three-factor solution in both clinical (Antony et al., 1998; Clara et al., 2001) and non-clinical samples (Henry & Crawford, 2005). This DASS-21 factor structure is actually cleaner and more distinct than the longer 42-item version (Henry & Crawford, 2005). Empirical evidence indicates that the DASS-42 possesses adequate convergent and discriminant validity (Henry & Crawford, 2005). The DASS-21, like the longer version, is associated with very good reliability estimates (Antony et al., 1998; Clara et al., 2001). Normative data ($M = 18.86$,

$SD = 19.32$ for total score) have been reported for a large non-clinical sample (Henry & Crawford, 2005). In the current study, Cronbach's α was strong for the depression (.92), anxiety (.84), and stress subscales (.88), as well as for the total scale (.95).

Procedures

Upon arriving to a psychology research laboratory, each participant was asked to read and sign an informed consent. Those willing to participate were escorted into an individual study room to complete a set of questionnaires, which included a demographics form, IDI, ERSS, DASS-21, FNEB, TMS-T, as well as the STAI-S and PANAS-NA (Time 1).

Dependency-Mood Induction. Once finished, the experimenter returned to the room to administer the dependency-mood induction. An induction procedure is an optimal methodological approach for meeting the goals of this study because in real-world settings, treatment techniques are implemented for symptomatic clients. Therefore, it makes sense to activate the core cognitive and affective features of dependency to increase the ecological validity of implementing an intervention.

The mood induction was constructed by integrating procedures developed by Broderick (2005) and Bornstein et al. (2005). While similar, this integrated induction has not been used in prior studies in its current form. Barber's *Adagio for Strings*, a gloomy song used in Broderick's (2005) manipulation, was played as background music throughout the dependency-mood induction. In total, the induction procedure was approximately 10-minutes long and included two stages:

(1) The first part of the mood induction was adapted from Broderick's (2005) depression manipulation, which instructed participants to read a series of negative self-statements (e.g., "I have too many bad things in my life"). To redesign this for the purposes of the current study, dependency terms were acquired from a dependency-priming manipulation conducted by Bornstein and colleagues (2005). These dependency terms (e.g., weak) were then framed as self-statements that would ostensibly activate the core cognitive (i.e., *the helpless self-schema*) and affective (e.g., fears of abandonment) features that underlie dependency problems (Bornstein, 1992; Zuroff & Mongrain, 1987). Each participant listened and read along with these 16 dependency self-statements (e.g., "I am weak and powerless" and "My close friends are likely to abandon me" see Appendix A), which were presented on the computer via a PowerPoint slide-show (one statement per page for 15s each). Participants were instructed to "experience each statement as if it were written for you."

(2) The last slide prompted the participant to "write about a recent time in which you felt rejected or abandoned by someone you care about." This was included to make the induction personally relevant and to further activate abandonment concerns.

Participants were provided a pen and lined paper to record their story for five minutes.

Subsequent to the mood induction, the experimenter returned to the study room to have the participant complete another STAI-S and PANAS-NA (Time 2). Participants were then assigned, based on a blocked randomization procedure, to either a mindfulness treatment or a distraction (control) treatment. Blocked randomization served to maintain an equal balance of participants across the treatment conditions.

Mindfulness Treatment. Those assigned to the mindfulness condition practiced mindfulness meditation by listening to an audio recording. This 20-minute audio recording (UCLA Mindful Awareness Research Center, 2009) offered introductory meditation instruction by directing the participant's attention to the breath, which served as an "anchor" throughout the meditation. The participant was guided to notice when the mind wanders into thoughts and feelings and to then return attention to breathing with acceptance and non-judgment. It was expected that this mindfulness task would help participants to disengage from the cognitive and emotional features of dependency, which had just been activated by the induction. The recording also provided silent practice periods and occasional prompts during these periods to escort the participant's attention back to the breath.

Distraction (Control) Treatment. Participants assigned to the distraction group followed a modified version of Broderick's (2005) thought distraction protocol. Participants listened to an audio recording that instructed them to use their "imagination and concentration to focus on each of the following ideas." A neutral idea (e.g., "a freshly painted door," see Appendix B) was then presented audibly every 30 seconds. The distraction condition was created to mirror the inactive components of the mindfulness intervention as closely as possible and to be consistent with previous research. Participants listened to this recording for a total of 20 minutes, as akin to the mindfulness group.

Following the treatment condition, the experimenter returned to the study room to have participants complete the TMS-S and the final STAI-S and PANAS-NA (Time 3).

Participants were subsequently debriefed, given a one-page debriefing summary that included the names of psychological resources on campus, and were compensated with five dollars and a course credit.

CHAPTER 3: RESULTS

Demographic and Baseline Mental Health Data

To compare the mindfulness group ($n = 35$) and distraction group ($n = 35$) on demographic and baseline mental health data, independent samples t tests and chi-square tests of independence were used (see Table 1). The groups did not significantly differ on any of the demographic characteristics. There was a marginally significant relationship between treatment group and mindfulness experience, $X^2(1, N = 70) = 3.62, p = .06$.² With regard to the baseline mental health data, there was a significant difference in total DASS-21 scores between the mindfulness ($M = 42.4, SD = 31.2$) and distraction ($M = 25.3, SD = 19.7$) groups, $t(57.4) = -2.74, p < .05$. Subsequent t tests indicated that the mindfulness group reported higher scores on all three subscales of the DASS-21 relative to the distraction group. Because differences in demographic and baseline mental health data were not predicted a priori, a Bonferroni correction was employed. All group differences became nonsignificant at the adjusted alpha level of .004 (i.e., $.05/13$ analyses).

Manipulation Check

As the dependency-mood induction was intended to produce emotional distress, paired t tests were used to evaluate changes in state mood from Time 1 to Time 2. Results revealed that scores increased following the dependency-mood induction for both the STAI-S, $t(69) = 5.95, p < .001$, and the PANAS-NA, $t(69) = 6.38, p < .001$. This

² To test if participants with mindfulness experience were exerting an undue influence on the findings of this study, analyses that excluded such participants were conducted and were found to produce essentially identical results.

suggests that the mood induction achieved the desired effect of exacerbating state anxiety and state negative affect. In addition, bivariate correlations showed that IDI scores significantly predicted STAI-S at Time 2, $r(68) = .36, p < .05$, and PANAS-NA at Time 2, $r(68) = .33, p < .05$. In other words, the more dependent participants generally reported greater levels of distress after the mood induction. This would be expected for an induction procedure that aims to activate dependency-related symptoms.

State Mindfulness by Treatment Group

To evaluate the hypothesis that the mindfulness condition would be more successful than the control condition at increasing state mindfulness, a regression analysis was performed using baseline TMS-T and pooled treatment group ($N = 70$) as predictors of TMS-S (see Table 3). For the treatment group in this and all other regression analyses, the distraction group was coded as 0, while the mindfulness group was coded as 1. When controlling for TMS-T, treatment group significantly predicted TMS-S ($\beta = 0.27$), $t(67) = 2.58, p < .05$. The positive β value implies that the mindfulness condition was superior to the distraction condition at enhancing state mindfulness, even in the presence of baseline trait mindfulness.

As a test of the hypothesis that the mindfulness group would report higher levels of state curiosity and state decentering than the control group, independent samples t tests were conducted on the TMS-S subscales. The mindfulness group ($M = 3.58, SD = 0.89$) reported significantly higher scores on TMS-S-Curiosity than the distraction group ($M = 3.05, SD = 0.95$), $t(68) = -2.43, p < .05$. Similarly, for the TMS-S-Decentering, the mindfulness group ($M = 3.39, SD = 0.74$) reported significantly higher scores than the

distraction group ($M= 2.95$, $SD= 0.86$), $t(68)=-2.27$, $p < .05$. These results evince that the mindfulness group was indeed successful in enhancing both the curiosity and decentering facets of state mindfulness.

State Mood Measures by Treatment Group

As an initial exploration of any differences between treatment groups on the state mood measures, repeated measures ANOVAs were conducted with treatment group set as the between-subjects factor, Time (three levels for each time point) set as the within-subjects factor, and the STAI-S scores set as the dependent variable for one analysis and the PANAS-NA scores set as the dependent variable for a second analysis. The means and standard deviations for the STAI-S and PANAS-NA scores by treatment group are presented in Table 2. The ANOVA analyses indicated a significant time by treatment group effect for both the STAI-S, Wilks' Lambda = .85, $F(2, 67) = 5.90$, $p < .05$, and the PANAS-NA, Wilks' Lambda = .87, $F(2, 67) = 5.08$, $p < .05$.

Follow-up independent samples t tests were used on STAI-S and PANAS-NA scores at each of the three administrations to locate group differences. The only significant finding was for the PANAS-NA at Time 2; that is, the mindfulness group ($M= 20.9$, $SD= 10.6$) reported more negative affect than the distraction group ($M= 16.2$, $SD= 7.1$) after the dependency-mood induction, $t(59.7)=-2.20$, $p < .05$. Likewise, for the STAI-S at Time 2, there was a marginally significant difference between the mindfulness group ($M= 50.5$, $SD= 14.6$) and distraction group ($M= 43.5$, $SD= 15.0$), $t(68)=-1.98$, $p = .05$.

Further analyses became necessary to test the hypothesis that the mindfulness group would report greater reductions in state anxiety and state negative affect than the control group. In accordance with recommendations by Wei and Zhang (2001), regression analyses were conducted to partial out the substantial imbalance in pre-treatment outcome measures (see Table 3)³. When controlling for pre-treatment scores on the STAI-S (Time 2), treatment group significantly predicted post-treatment STAI-S (Time 3), ($\beta = -0.24$), $t(67) = -2.63$, $p < .05$. Moreover, when controlling for pre-treatment scores on the PANAS-NA (Time 2), treatment group significantly predicted post-treatment PANAS-NA (Time 3), ($\beta = -0.20$), $t(67) = -2.13$, $p < .05$. As evidenced by the negative β values, the mindfulness group had greater efficacy at alleviating state anxiety and state negative affect.

Mediation Analyses

Baron and Kenny's (1986) and Kazdin's (2007) criteria for testing mediation were used to examine the hypothesis that the effects of treatment group on anxiety and negative affect were mediated by the decentering, but not curiosity, facet of state mindfulness. As previously noted, analyses indicated that treatment group was related to both mindfulness subscales (i.e., curiosity and decentering), as well as therapeutic change. To investigate the remaining conditions for mediation, four hierarchical regression analyses were performed on pooled groups ($N = 70$). The results of these

³ DASS scores were not added as a covariate because they were found to be highly associated with the state mood measures ($r > .60$). Thus, to avoid redundant covariates, only pre-treatment STAI-S and PANAS-NA were controlled for in the analyses.

mediation analyses should be interpreted with caution, as will be described in the discussion section.

The first two hierarchical regression analyses were used to test curiosity as a potential mediator (see Table 4); post-treatment outcome scores (STAI-S and PANAS-NA at Time 3) were treated as criterion variables predicted by their corresponding pre-treatment scores (Time 2) in the first step, the curiosity subscale of the TMS-S in the second step, and treatment group in the final step. When controlling for the variance in pre-treatment outcome measures and treatment group, TMS-S-Curiosity did not account for a significant portion of the variance in post-treatment STAI-S, ($\beta = -0.16$), $t(66) = -1.71$, $p = .09$, nor post-treatment PANAS-NA, ($\beta = -0.02$), $t(66) = -0.16$, $p = .87$. These analyses imply that there is little reason to believe that state curiosity mediated reductions in the outcome measures.

To test decentering as a potential mediator, post-treatment outcome scores (STAI-S and PANAS-NA at Time 3) were regressed on their corresponding pre-treatment scores (Time 2) in the first step, the decentering subscale of the TMS-S in the second step, and treatment group in the final step (see Table 5). After partialling out pre-treatment scores and treatment group, TMS-S-Decentering had a significant, inverse relationship with both post-treatment STAI-S, ($\beta = -0.32$), $t(66) = -3.80$, $p < .001$, and post-treatment PANAS-NA, ($\beta = -0.23$), $t(66) = -2.59$, $p < .05$. Moreover, in the final step, treatment group became a nonsignificant predictor in both the STAI-S model, ($\beta = -0.14$), $t(66) = -1.70$, $p = .09$, and the PANAS-NA model, ($\beta = -0.13$), $t(66) = -1.42$, $p = .16$. These findings are

consistent with the hypothesis that decentering fully mediated reductions in the outcome measures.

CHAPTER 4: DISCUSSION

This study produced several noteworthy findings regarding interpersonal dependency and how mindfulness could be applied as a treatment. The novel dependency-mood induction proved to raise anxiety and negative affect in a sample of highly dependent undergraduates. Evidently, participants identified with the weak and helpless self-perceptions and fears of abandonment.

Replicating previous research (e.g., Zeidan et al., 2010b), the brief mindfulness intervention was found to be superior to the distraction condition at increasing mindful attention; the mindfulness group reported higher levels on both mindfulness subscales (i.e., curiosity and decentering).

It was next hypothesized that, relative to distraction, the mindfulness treatment would result in a greater reduction in state anxiety and state negative affect. The treatment groups, however, did not start out as equal; as evidenced by a marginally significant difference on the STAI-S and a significant difference on the PANAS-NA at Time 2, the mindfulness group reported more anxiety and negative affect at pre-treatment. This was not anticipated because (a) participants were randomly assigned to the treatment conditions and (b) through Time 2, all participants underwent the same study procedures; it was only *after* the Time 2 assessments that the groups were treated in a systematically different way (i.e., the introduction of the treatment conditions). Since baseline scores on the DASS-21 also differed significantly ($p < .05$), it is believed that the mindfulness group was, simply by chance, more symptomatic at pre-treatment than the distraction group.

One could argue that this poses a disadvantage for the mindfulness group because highly symptomatic individuals have a slower return to emotional baseline (Craighead, Miklowitz, & Craighead, 2008; Linehan, 1993). If the two treatment conditions were equally efficacious, the mindfulness group would be expected to report *more* anxiety and negative affect than the distraction group at post-treatment. The opposite was found; despite significant pre-treatment differences, the mindfulness group's outcome scores actually dipped below the distraction group's scores at post-treatment (see Table 2).

Statisticians (see Wei & Zhang, 2001) recommend correcting for imbalances in pre-treatment outcome variables; when controlling for the imbalance in STAI-S and PANAS-NA at Time 2, the mindfulness intervention was associated with less anxiety and negative affect at post-treatment, relative to distraction. It should be noted that these results cannot be explained by regression to the mean alone (see Vickers & Altman, 2001). Rather, as consistent with other investigations (e.g., Broderick, 2005), these results imply that mindfulness confers some advantage over thought distraction. The prospect that mindfulness training ameliorates dependency-related distress better than distraction is augmented by this study's design, which allowed for a direct comparison of these two techniques without introducing therapist factors.

The curiosity and decentering facets of mindfulness were examined as potential mediators of treatment gains. In line with findings reported by Lau and colleagues (2006), decentering was a much better predictor of outcome than curiosity. Decentering accounted for 12.6% of the variance in reductions in anxiety and 7% of the variance in reductions in negative affect (see Table 5). Unlike the curiosity subscale, decentering

remained a significant predictor of the decreases in STAI-S and PANAS-NA, even in the presence of treatment group (i.e., distraction vs. mindfulness). The discovery that treatment group was no longer a significant predictor in both the STAI-S and PANAS-NA models is congruent with the idea that decentering fully mediated treatment gains. As articulated by other researchers (e.g., Lau et al., 2006; Segal, Williams, and Teasdale, 2002), decentering appears to be a principal ingredient of change in mindfulness-based interventions. In addition, these results imply that decentering helps dependent individuals to disengage from the cognitive and affective features of interpersonal dependency.

There are a number of limitations associated with the current research. The proposed mediators (i.e., curiosity and decentering) were assessed at the same time as the post-treatment outcome variables. Given this design, it is impossible to firmly establish that increases in decentering preceded, and therefore potentially mediated, reductions in anxiety and negative affect. Although the results of this study are consistent with, and provide preliminary support for, a mediation model, it could also be that changes in anxiety and negative affect produced the changes in decentering.

Another caveat to these findings is that a floor effect may have occurred at Time 3 for the PANAS-NA, which has a minimum score of 10 (see Table 2). However, by examining the corresponding reductions in STAI-S, it is unlikely that the PANAS-NA severely restricted reports of negative affect at post-treatment for either treatment group.

It should be highlighted that this study did not examine the impact of mindfulness on dependency, per se. The state anxiety and state negative affect instruments merely

served as proxies for studying dependency-related distress, given that dependency is strongly linked with anxiety/depression (Bornstein, 1992; Overholser & Freiheit, 1994). The current study would have benefited from the use of a more relevant dependent variable. Unfortunately, a valid state measure of interpersonal dependency does not exist.

As the vast majority of participants in the study were White, female college students, the ability to generalize results to the broader dependent population is limited and awaits replication using a more demographically-diverse, treatment-seeking sample. It should be noted that this imbalance in gender representation is typical when recruiting dependent individuals, as females tend to score higher than males on trait measures of interpersonal dependency (Bornstein, 2005). Additionally, although participants in this study reported substantial levels of dependency, it is unknown to what extent their dependency scores represent clinically meaningful problems (e.g., meeting criteria for DPD).

Future research is needed to improve our understanding of the efficacy of mindfulness for treating interpersonal dependency and DPD. As divergent from the current study, future research should examine the impact of mindfulness on behavioral features (e.g., reassurance-seeking) of interpersonal dependency. This could be assessed by judges' ratings of reassurance-seeking behavior after a mindfulness intervention (see Joiner & Metalsky, 2001). It seems reasonable to suspect that mindfulness may galvanize change in dependency-related behaviors because research implies that mindfulness improves behavior regulation (Carmody et al., 2009; Crane et al., 2008) and

healthy interpersonal functioning (Barnes et al., 2007; Carson et al., 2004; Michaels, 2009; Tloczynski & Tantriella, 1998).

The results of the current study also implicate the need for a multi-week randomized clinical trial (RCT). Using this methodology, semi-structured interviews for DPD and trait dependency measures could be administered at several time points. This would allow researchers to explore how mindfulness affects behavioral and interpersonal features of dependency over longer periods of time. Also, assessing outcome and potential mediating variables (e.g., decentering, acceptance, autonomy) throughout a long-term RCT could further illuminate the underlying processes that account for the salubrious effects of mindfulness training.

Because the links between interpersonal dependency and anxiety, depression, and DPD are so clear, it is critical for researchers to redouble their efforts in developing efficacious treatments in this area. Mindfulness techniques seem to be a worthy candidate, especially given that they are relatively time- and cost- efficient to implement (Ma & Teasdale, 2004). This is important when considering the dissemination of dependency interventions.

The purpose of this line of research is not necessarily to determine if mindfulness is superior to existing techniques (e.g., cognitive restructuring, interpersonal skills training, etc.). Rather, as described by Bornstein (2005), the key to successful dependency treatment is targeting the cognitive, motivational, behavioral, and emotional features with an array of treatment approaches. In other words, an integrative, multimodal intervention that incorporates mindfulness (e.g., as similar to dialectical

behavior therapy) may prove to have the greatest benefit for dependent clients. Future treatment development should address the challenge of integrating change and acceptance techniques by referring to other dialectical models (e.g., Hayes, Strosahl, & Wilson, 1999; Linehan, 1993).

The present study provides the first empirical evidence that mindfulness practice may be an important adjunct for alleviating the symptoms of interpersonal dependency and possibly even DPD. Considering the incipient nature of this research, applying these findings to clinical practice is severely limited without future validation. Certainly, these preliminary results imply that the intersection between mindfulness and dependency merits further refinement and study.

REFERENCES

- Alexander, J. F., & Abeles, N. (1968). Dependency changes in psychotherapy as related to interpersonal relationships. *Journal of Consulting and Clinical Psychology, 32*, 685-689.
- Altmaier, E., & Maloney, R. (2007). An initial evaluation of a mindful parenting program. *Journal of Clinical Psychology, 63*, 1231-1238.
- American Psychiatric Association. (2000). *Diagnostic and statistical manual of mental disorders* (4th ed., text revision). Washington, DC: Author.
- Anderson, N. D., Lau, M. A., Segal, Z. V., Bishop, S. R. (2007). Mindfulness-based stress reduction and attentional control. *Clinical Psychology and Psychotherapy, 14*, 449-463.
- Antony, M. M., Bieling, P. J., Cox, B. J., Enns, M. W., & Swinson, R. P. (1998). Psychometric properties of the 42-item and 21-item versions of the depression anxiety stress scales in clinical groups and a community sample. *Psychological Assessment, 10*, 176-181.
- Arch, J. J., & Craske, M. G. (2006). Mechanisms of mindfulness: Emotion regulation following a focused breathing induction. *Behavior Research and Therapy, 44*, 1849-1858.
- Baer, R. A. (2003). Mindfulness training as a clinical intervention: A conceptual and empirical review. *Clinical Psychology: Science and Practice, 10*, 125-143.

- Barnes, S., Brown, K. W., Krusemark, E., Campbell, W. K., & Rogge, R. D. (2007). The role of mindfulness in romantic relationship satisfaction and responses to relationship stress. *Journal of Marital and Family Therapy, 33*, 482-500.
- Baron, R. M., & Kenny, D. A. (1986). The moderator-mediator variable distinction in social psychological research: Conceptual, strategic, and statistical considerations. *Journal of Personality and Social Psychology, 51*, 1173-1182.
- Benjamin, L. S., & Karpiak, C. P. (2001). Personality disorders. *Psychotherapy, 38*, 487-491.
- Birtchnell, J. (1988). Defining dependence. *British Journal of Medical Psychology, 61*, 111-123.
- Bishop, S. R., Lau, M., Shapiro, S., Carlson, L., Anderson, N.D., Carmody, J., et al. (2004). Mindfulness: A proposed operational definition. *Clinical Psychology: Science & Practice, 11*, 230-241.
- Black, D. W., Monahan, P., Wesner, R., Gabel, J., & Bowers, W. (1996). The effect of fluvoxamine, cognitive therapy, and placebo on abnormal personality traits in 44 patients with panic disorder. *Journal of Personality Disorders, 10*, 185-194.
- Blatt, S. J. (1992). The differential effect of psychotherapy and psychoanalysis with anaclitic and introjective patients. *Journal of the American Psychoanalytic Association, 40*, 691-724.
- Blatt, S. J., D'Afflitti, J. P., & Quinland, D. M. (1976). Experiences of depression in normal young adults. *Journal of Abnormal Psychology, 85*, 383-389.

- Blatt, S. J., & Ford, R. Q. (1994). *Therapeutic change: An object relations perspective*. New York, NY: Plenum.
- Bootzin, R. R., & Stevens, S. J. (2005). Adolescents, substance abuse, and the treatment of insomnia and daytime sleepiness. *Clinical Psychology Review, 25*, 629-644.
- Borge, F. M., Hoffart, A., Sexton, H., Martinsen, E. W., Gude, T., Hedley, L. M., & Abrahamsen, G. (2010). Pre-treatment predictors and in-treatment factors associated with change in avoidant and dependent personality disorder traits among patients with social phobia. *Clinical Psychology and Psychotherapy, 17*, 87-99.
- Bornstein, R. F. (1992). The dependent personality: Developmental, social, and clinical perspectives. *Psychological Bulletin, 112*, 3-23.
- Bornstein, R. F. (1994). Adaptive and maladaptive aspects of dependency: An integrative review. *American Journal of Orthopsychiatry, 64*, 622-635.
- Bornstein, R. F. (1995). Active dependency. *Journal of Nervous and Mental Disease, 183*, 64-77.
- Bornstein, R. F. (1997). Long-term retest reliability of Interpersonal Dependency Inventory scores in college students. *Assessment, 4*, 175-187.
- Bornstein, R. F. (1999). Criterion validity of objective and projective dependency tests: A meta-analytic assessment of behavioral prediction. *Psychological Assessment, 11*, 48-57.

- Bornstein, R. F. (2004). Integrating cognitive and existential treatment strategies in psychotherapy with dependent patients. *Journal of Contemporary Psychotherapy*, 34, 293-309.
- Bornstein, R. F. (2005). *The dependent patient: A practitioner's guide*. Washington, DC: American Psychological Association.
- Bornstein, R. F. (2006). Self-schema priming and desire for test performance feedback: Further evaluation of a cognitive/interactionist model of interpersonal dependency. *Self and Identity*, 5, 110-126.
- Bornstein, R. F., Becker-Maturo, N., Winarick, D. J., & Reichman, A. L. (2010). Interpersonal dependency in borderline personality disorder: Clinical context and empirical evidence. *Journal of Personality Disorders*, 44, 109-127.
- Bornstein, R. F., & Kennedy, T. D. (1994). Interpersonal dependency and academic performance. *Journal of Personality Disorders*, 8, 240-248.
- Bornstein, R. F., Ng, H. M., Gallagher, H. A., Kloss, D. M., & Regier, N. G. (2005). Contrasting effects of self-schema priming on lexical decisions and interpersonal stroop task performance: Evidence for a cognitive/interactionist model of interpersonal dependency. *Journal of Personality*, 73, 731-761.
- Bornstein, R. F., Riggs, J. M., Hill, E. L., & Calabrese, C. (1996). Activity, passivity, self-denigration, and self-promotion: Toward an interactionist model of interpersonal dependency. *Journal of Personality*, 64, 637-673.

- Bornstein, R. F., Rossner, S. C., & Hill, E. L. (1994). Retest reliability of scores on objective and projective measures of dependency: Relationship to life events and inter-test interval. *Journal of Personality Assessment*, 62, 398-415.
- Broderick, P. C. (2005). Mindfulness and coping with dysphoric mood: Contrasts with rumination and distraction. *Cognitive Therapy and Research*, 29, 501-510.
- Brown, K. W., & Ryan, R. M. (2003). The benefits of being present: Mindfulness and its role in psychological well-being. *Journal of Personality and Social Psychology*, 84, 822-848.
- Carmody, J., Baer, R. A., Lykins, E. L. B., & Olendzki, N. (2009). An empirical study of the mechanisms of mindfulness in a mindfulness-based stress reduction program. *Journal of Clinical Psychology*, 65, 613-626.
- Carmody, J., Crawford, S., & Churchill, L. (2006). A pilot study of mindfulness-based stress reduction for hot flashes. *Menopause: The Journal of the North American Menopause Society*, 13, 760-769.
- Carson, J. W., Carson, K. M., Gil, K. M., & Baucom, D. H. (2004). Mindfulness-based relationship enhancement. *Behavior Therapy*, 35, 471-494.
- Chiesa, A., Brambilla, P., & Serretti, A. (2010). Functional neural correlates of mindfulness meditations in comparison with psychotherapy, pharmacotherapy and placebo effect. Is there a link? *Acta Neuropsychiatrica*, 22, 104-117.
- Chiesa, A., & Serretti, A. (2009). Mindfulness-based stress reduction for stress management in healthy people: A review and meta-analysis. *The Journal of Alternative and Complementary Medicine*, 15, 593-600.

- Clara, I. P., Cox, B. J., & Enns, M. W. (2001). Confirmatory factor analysis of the depression anxiety stress scales in depressed and anxious patients. *Journal of Psychopathology and Behavioral Assessment*, 23, 61-67.
- Cogswell, A., Alloy, L. B., Karpinski, A., & Grant, D. (2010). Assessing dependency using self-report and indirect measures: Examining the significance of discrepancies. *Journal of Personality Assessment*, 92, 306-316.
- Collins, K. A., Westra, H. A., Dozois, D. J. A., & Stewart, S. H. (2005). The validity of the brief version of the fear of negative evaluation scale. *Anxiety Disorders*, 19, 345-359.
- Craighead, W. E., Miklowitz, D. J., & Craighead, L. W. (2008). *Psychopathology: History, diagnosis, and empirical foundations*. New York, NY: John Wiley & Sons Inc.
- Crane, C., Barnhofer, T., Duggan, D. S., Hepburn, S., Fennell, M. V., & Williams, J. M. G. (2008). Mindfulness-based cognitive therapy and self-discrepancy in recovered depressed patients with a history of depression and suicidality. *Cognitive Therapy and Research*, 32, 775-787.
- Creswell, J. D., Eisenberger, N. I., & Liberman, M. D. (2006). Neurobehavioral correlates of mindfulness during social exclusion. Manuscript in preparation.
- Davis, K. M., Lau, M. A., & Cairns, D. R. (2009). Development and preliminary validation of a trait version of the Toronto Mindfulness Scale. *Journal of Cognitive Psychology: An International Quarterly*, 23, 185-197.

- Forman, E. M., Herbert, J. D., Moitra, E., Yeomans, P. D., & Geller, P. A. (2007). A randomized controlled effectiveness trial of acceptance and commitment therapy and cognitive therapy for anxiety and depression. *Behavior Modification, 31*, 772-799.
- Goldin, P. R., Ramel, W., & Gross, J. (2009). Mindfulness meditation training and self-referential processing in social anxiety disorder: Behavioral and neural effects. *Journal of Cognitive Psychotherapy: An International Quarterly, 23*, 242-257.
- Hayes, S. C., Strosahl, K., & Wilson, K. G. (1999). *Acceptance and commitment therapy*. New York, NY: Guilford Press.
- Heppner, W. L., Kernis, M. H., Lakey, C. E., Campbell, W. K., Goldman, B. M., Davis, P. J., & Cascio, E. V. (2008). Mindfulness as a means of reducing aggressive behavior: Dispositional and situational evidence. *Aggressive Behavior, 34*, 486-496.
- Henry, J. D., & Crawford, J. R. (2005). The short-form version of the depression anxiety and stress scales (DASS-21): Construct validity and normative data in a large non-clinical sample.
- Hirschfeld, R. M. A., Klerman, G. L., Clayton, P. J., & Keller, M. B. (1983). Personality and depression: Empirical findings. *Archives of General Psychiatry, 40*, 993-998.
- Hirschfeld, R. M. A., Klerman, G. L., Gough, H. G., Barrett, J., Korchin, S. J., & Chodoff, R. (1977). A measure of interpersonal dependency. *Journal of Personality Assessment, 41*, 610-618.

- Hofmann, S. G., Sawyer, A. T., Witt, A. A., & Oh, D. (2010). The effect of mindfulness-based therapy on anxiety and depression: A meta-analytic review. *Journal of Consulting and Clinical Psychology, 78*, 169-183.
- Huprich, S. K., Clancy, C., Bornstein, R. F., & Nelson-Gray, R. O. (2004). Do dependency and social skills combine to predict depression? Linking two diatheses in mood disorders research. *Individual Differences Research, 2*, 2-16.
- Jain, S., Shapiro, S., Swanick, S., Roesch, S., Mills, P., Bell, I., & Schwartz, G. (2007). A randomized controlled trial of mindfulness meditation versus relaxation training: effects on distress, positive states of mind, rumination, and distraction. *Annals of Behavioral Medicine, 3*, 11-21.
- Jazaieri, H., & Shapiro, S. (2010). Managing stress mindfully. In Plante, T. G. (Ed.), *Contemplative practices in action: Spirituality, meditation, and health*. Santa Barbara, CA: Praeger.
- Joiner, T. E., Jr., Alfano, M. S., & Metalsky, G. I. (1992). When depression breeds contempt: Reassurance seeking, self-esteem, and rejection of depressed college students by their roommates. *Journal of Abnormal Psychology, 101*, 165-173.
- Joiner, T. E., Jr., & Metalsky, G. I. (1995). A prospective test of an integrative interpersonal theory of depression: A naturalistic study of college roommates. *Journal of Personality and Social Psychology, 69*, 778-788.
- Joiner, T. E., Jr., & Metalsky, G. I. (2001). Excessive reassurance seeking: Delineating a risk factor involved in the development of depressive symptoms. *Psychological Science, 12*, 371-378.

- Kabat-Zinn, J. (1982). An outpatient program in behavioral medicine for chronic pain patients based on the practice of mindfulness meditation: theoretical considerations and preliminary results. *General Hospital Psychiatry, 4*, 33-47.
- Kabat-Zinn, J. (1994). *Wherever you go, there you are*. New York, NY: Hyperion.
- Kabat-Zinn, J. (2005). *Full catastrophe living: Using the wisdom of your body and mind to face stress, pain, and illness*. New York, NY: Delacorte.
- Kazdin, A. E. (2007). Mediators and mechanisms of change in psychotherapy research. *Annual Review of Clinical Psychology, 3*, 1-27.
- Kliem, S., Kroger, C., & Kosfelder, J. (2010). Dialectical behavior therapy for borderline personality disorder: A meta-analysis using mixed-effects modeling. *Journal of Consulting and Clinical Psychology, 78*, 936-951.
- Lau, M. A., Bishop, S. R., Segal, Z. V., Buis, T., Anderson, N. D., Carlson, L., Shapiro, S., Carmody, J., Abbey, S., & Devins, G. (2006). The Toronto Mindfulness Scale: Development and validation. *Journal of Clinical Psychology, 62*, 1445-1467.
- Leary, M. R. (1983). A brief version of the Fear of Negative Evaluation Scale. *Personality and Social Psychology Bulletin, 9*, 371-375.
- Leigh, J. (2010). Self-determined mindfulness and attachment style in college students. *Dissertation Abstracts International: Section B: The Sciences and Engineering, 71*, 3360.
- Linehan, M. M. (1993). *Cognitive-behavioral treatment of borderline personality disorder*. New York, NY: Guilford Press.

- Loas, G., Corcos, M., Perez-Diaz, F., Verrier, A., Guelfi, J. D., Halfon, O., et al. (2002). Criterion validity of the Interpersonal Dependency Inventory: A preliminary study of 621 addictive subjects. *European Psychiatry*, 17, 477-478.
- Lovibond, S. H., & Lovibond, P. F. (1995). *Manual for the depression anxiety stress scales*. Sydney: Psychological Foundation.
- Luoma, J. B., Hayes, S. C., & Walser, R. D. (2007). *Learning ACT: An acceptance & commitment therapy skills-training manual for therapists*. Oakland, CA: New Harbinger Publications.
- Ma, S. H., & Teasdale, J. D. (2004). Mindfulness-based cognitive therapy for depression: Replication and exploration of differential relapse prevention effects. *Journal of Consulting and Clinical Psychology*, 72, 31-40.
- Mathew, K. L., Whitford, H. S., Kenny, M. A., & Denson, L. A. (2010). The long-term effects of mindfulness-based cognitive therapy as a relapse prevention treatment for major depressive disorder. *Behavioural and Cognitive Psychotherapy*, 38, 561-576.
- Michaels, J. B. (2009). Mindfulness training and relationship satisfaction. *Dissertation Abstracts International: Section B: the Sciences and Engineering*, 69, 5043.
- Millon, T. (1990). *Toward a new personology: An evolutionary model*. New York, NY: John Wiley & Sons Inc.
- Moore, R. G., & Blackburn, I. M. (1996). The stability of sociotropy and autonomy in depressed patients undergoing treatment. *Cognitive Therapy and Research*, 20, 69-80.

- Nelson-Gray, R. O., Johnson, D., Foyle, L. W., Danial, S. S., & Harmon, R. (1996). The effectiveness of cognitive therapy tailored to depressives with personality disorders. *Journal of Personality Disorders, 10*, 132-152.
- Nice, P. R. (2008). Mindfulness interventions in the treatment of substance and mood disorders. *Dissertation Abstracts International: Section B: The Sciences and Engineering, 69*, 1982.
- Nietzel, M. T., & Harris, M. J. (1990). Relationship of dependency and achievement/autonomy to depression. *Clinical Psychology Review, 10*, 279-297.
- Ortner, C. N. M., Kilner, S. J., & Zelazo, P. D. (2007). Mindfulness meditation and reduced emotional interference on a cognitive task. *Motiv Emot, 31*, 271-283.
- Orzech, K. M., Shapiro, S. L., Brown, K. W., & McKay, M. (2009). Intensive mindfulness training-related changes in cognitive and emotional experience. *The Journal of Positive Psychology, 4*, 212-222.
- Overholser, J. C. (1990). Emotional reliance and social loss: Effects on depressive symptomatology. *Journal of Personality Assessment, 55*, 618-629.
- Overholser, J. C. (1997). Treatment of excessive interpersonal dependency: A cognitive-behavioral model. *Journal of Contemporary Psychotherapy, 27*, 283-300.
- Overholser, J. C., & Fine, M. A. (1994). Cognitive-behavioral treatment of excessive interpersonal dependency: A four-stage psychotherapy model. *Journal of Cognitive Psychotherapy, 8*, 55-70.

- Overholser, J. C., & Freiheit, S. R. (1994). Assessment of interpersonal dependency using the Million Clinical Multiaxial Inventory-II (MCMI-II) and the Depressive Experiences Questionnaire. *Personality and Individual Differences, 17*, 71-78.
- Peterson, R. A., & Heilbronner, R. L. (1987). The anxiety sensitivity index: Construct validity and factor analytic structure. *Journal of Anxiety Disorders, 1*, 117-121.
- Pincus, A. L., & Gurtman, M. B. (1995). The three faces of interpersonal dependence: Structural analyses of self-report dependency measures. *Journal of Personality and Social Psychology, 69*, 744-758.
- Pincus, A. L., & Wilson, K. R. (2001). Interpersonal variability in dependent personality. *Journal of Personality, 69*, 223-251.
- Ramel, W., Goldin, P. R., Carmona, P. E., & McQuaid, J. R. (2004). The effects of mindfulness meditation on cognitive process and affect in patients with past depression. *Cognitive Therapy and Research, 28*, 433-455.
- Rathus, J. H., Sanderson, W. C., Miller, A. L., & Wetzler, S. (1995). Impact of personality functioning on cognitive-behavioral treatment of panic disorder. *Journal of Personality Disorders, 9*, 160-168.
- Rector, N. A., Bagby, R. M., Segal, Z. V., Joffe, R. T., & Levitt, A. (2000). Self-criticism and dependency in depressed patients treated with cognitive therapy or pharmacotherapy. *Cognitive Therapy and Research, 24*, 571-584.
- Roemer, L., Orsillo, S. M., & Salters-Pedneault, K. (2008). Efficacy of an acceptance-based behavior therapy for generalized anxiety disorder: Evaluation in a

- randomized controlled trial. *Journal of Consulting and Clinical Psychology*, 76, 1083-1089.
- Rule, W. R., & Traver, M. D. (1983). Test-retest reliabilities of State-Trait Anxiety Inventory in a stressful social analogues situation. *Journal of Personality Assessment*, 47, 276-277.
- Safran, J. D., & Segal, Z. V. (1990). *Interpersonal process in cognitive therapy*. New York: Basic Books.
- Sauer, S., & Baer, R. A. (2010). Mindfulness and decentering as mechanisms of change in mindfulness- and acceptance-based interventions. In R. A. Baer (ed.), *Assessing mindfulness and acceptance processes in clients: Illuminating the theory and practice of change*. Oakland, CA: Context Press/New Harbinger Publications.
- Segal, Z. V., Williams, J. M. G., & Teasdale, J. D. (2002). *Mindfulness-based cognitive therapy for depression: A new approach to preventing relapse*. New York, NY: Guilford Press.
- Shapiro, S.L., Carlson, L. E., & Astin, J. A., Freedman, B. (2006). Mechanisms of mindfulness. *Journal of Clinical Psychology*, 62, 373-386.
- Shapiro, S. L., Oman, D., Thoresen, C. E., Plante, T. G., & Flinders, T. (2008). Cultivating mindfulness: Effects on well-being. *Journal of Clinical Psychology*, 64, 840-862.
- Shilkret, C. J., & Masling, J. M. (1981). Oral dependence and dependent behavior. *Journal of Personality Assessment*, 45, 125-129.

- Spielberger, C. D., Gorsuch, R. L., & Lushene, R. E. (1970). *Manual for the State-Trait Anxiety Inventory*. Palo Alto, CA: Consulting Psychologists Press.
- Spielberger, C. D., Reheiser, E. C., Ritterband, L.M., Sydeman, S. J., & Unger, K. K. (1995). Assessment of emotional states and personality traits: Measuring psychological vital signs. In J. N. Butcher (Ed.), *Clinical personality assessment: Practical approaches*. New York: Oxford University Press.
- Stewart, S. H., Knize, K., & Pihl, R. O. (1992). Anxiety sensitivity and dependency in clinical and non-clinical panickers and controls. *Journal of Anxiety Disorders*, 6, 119-131.
- Tacon, A. M., McComb, J., Caldera, Y., & Randolph, P. (2003). Mindfulness meditation, anxiety reduction, and heart disease: a pilot study. *Family & Community Health*, 26, 25-33.
- Teasdale, J. D., Moore, R. G., Hayhurst, H., Pope, M., Williams, S., & Segal, Z. V. (2002). Metacognitive awareness and prevention of relapse in depression: Empirical evidence. *Journal of Consulting and Clinical Psychology*, 70, 275-287.
- Tloczynski, J., & Tantriella, M. (1998). A comparison of the effects of Zen breath meditation or relaxation on college adjustment. *Psychologia: An International Journal of Psychology in the Orient*, 41, 32-43.
- Twohig, M. P., Hayes, S. C., Plumb, J. C., Pruitt, L. D., Collins, A. B., Hazlett-Stevens, H., & Woidneck, M. R. (2010). A randomized clinical trial of acceptance and commitment therapy versus progressive relaxation training for obsessive-

compulsive disorder. *Journal of Consulting and Clinical Psychology*, 78, 705-716.

UCLA Mindful Awareness Research Center. *Complete Meditation Instructions*, 2009.

MP3. Retrieved from: <http://marc.ucla.edu/body.cfm?id=22>

Verheul, R., van den Bosch, L. M. C., Koeter, M. W. J., de Ridder, M. A. J., Stijnen, T., & van den Brink, W. (2003). Dialectical behavior therapy for women with borderline personality disorder: 12-month, randomized clinical trial in the Netherlands. *British Journal of Psychiatry*, 182, 135-140.

Vickers, A. J., & Altman, D. G. (2001). Analysing controlled trials with baseline and follow up measurements. *British Medical Journal*, 323, 1123-1124.

Watson, D., & Clark, L. A. (1997). The measurement and mismeasurement of mood: Recurrent and emergent issues. *Journal of Personality Assessment*, 68, 267-296.

Watson, D., Clark, L. A., & Tellegen, A. (1988). Development and validation of brief measures of positive and negative affect: The PANAS scales. *Journal of Personality and Social Psychology*, 54, 1063-1070.

Wei, L., & Zhang, J. (2001). Analysis of data with imbalance in the baseline outcome variable for randomized clinical trials. *Drug Information Journal*, 35, 1201-1214.

Widiger, T. A. (1993). The DSM-III-R categorical personality disorder diagnoses: A critique and an alternative. *Psychological Inquiry*, 4, 75-90.

Zeidan, F., Gordon, N. S., & Goolkasian, P. (2009). The effects of brief meditation training on experimentally induced pain perception. *Journal of Pain*, 10, 1016-1019.

Zeidan, F., Johnson, S. K., Diamond, B. J., David, Z., & Goolkasian, P. (2010a).

Mindfulness meditation improves cognitive: Evidence of brief mental training.

Consciousness and Cognition, 19, 597-605.

Zeidan, F., Johnson, S. K., Gordon, N. S., & Goolkasian, P. (2010b). Effects of brief and

sham mindfulness meditation on mood and cardiovascular variables. *The Journal*

of Alternative and Complementary Medicine, 16, 867-873.

Zuroff, D., & Mongrain, M. (1987). Dependency and self-criticism: Vulnerability factors

for depressive affective states. *Journal of Abnormal Psychology*, 96, 14-22.

Table 1

Percentages / Means (and Standard Deviations) for Demographic and Baseline Mental Health Data According to Treatment Group

	Mindfulness (<i>n</i> = 35)	Distraction (<i>n</i> = 35)	<i>P</i> diff	Total (<i>N</i> = 70)
<i>Demographic Data</i>				
Age	19.1 (1.2)	19.0 (1.1)	.764	19.1 (1.2)
Gender (Female)	88.6%	91.4%	.690	90.0%
Race (Caucasian)	82.9%	88.6%	.495	85.7%
Prior Psychotherapy Experience	37.1%	31.4%	.615	34.3%
Prior Mindfulness Experience	25.7%	8.6%	.057	17.1%
<i>Baseline Mental Health Data</i>				
Interpersonal Dependency Inventory	64.0 (12.3)	63.5 (8.1)	.837	63.7 (10.3)
Depression, Anxiety, Stress Scales-21	42.4 (31.2)	25.3 (19.7)	.008	33.8 (27.3)
Depression Subscale	12.4 (11.5)	6.3 (8.8)	.016	9.4 (10.6)
Anxiety Subscale	12.7 (11.2)	6.7 (5.4)	.007	9.7 (9.2)
Stress Subscale	17.3 (11.3)	12.2 (7.8)	.030	14.7 (10.0)
Fear of Negative Evaluation-Brief	43.1 (9.8)	42.9 (7.4)	.924	43.0 (8.6)
Excessive Reassurance-Seeking Scale	15.2 (5.5)	14.7 (5.2)	.690	14.9 (5.3)
Toronto Mindfulness Scale-Trait	3.1 (0.6)	3.0 (0.5)	.445	3.0 (0.6)

Note. The *P*diff column shows significance levels based on *t* and χ^2 tests of group differences. All group differences are *ns* after using Bonferroni adjusted alpha levels of .004 per test (.05/13).

Table 2

Means (and Standard Deviations) for State Anxiety and State Negative Affect over Three Administrations According to Treatment Group

	Mindfulness (<i>n</i> = 35)		Distraction (<i>n</i> = 35)	
State Anxiety				
STAI-S (Time 1)	39.60	(13.14)	37.66	(12.04)
STAI-S (Time 2)	50.51	(14.60)	43.51	(14.99)
STAI-S (Time 3)	34.09	(11.34)	35.77	(13.37)
State Negative Affect				
PANAS-NA (Time 1)	15.69	(7.34)	12.89	(3.82)
PANAS-NA (Time 2)	20.91	(10.56)	16.17	(7.14)
PANAS-NA (Time 3)	12.43	(4.21)	12.54	(4.53)

Note. STAI-S = State Trait Anxiety Inventory- State Form; PANAS-NA = Negative Affect Subscale of the Positive and Negative Affect Schedule.

Table 3

Regression Analyses for Treatment Group Predicting State Mindfulness, State Anxiety, and State Negative Affect

	<i>B</i>	<i>SE B</i>	β
TMS-S (Time 3)			
TMS-T (Time 1)	0.64	0.14	0.46**
Treatment Group	0.42	0.16	0.27*
STAI-S (Time 3)			
STAI-S (Time 2)	0.59	0.07	0.72**
Treatment Group	-5.78	2.20	-0.24*
PANAS-NA (Time 3)			
PANAS-NA (Time 2)	0.33	0.04	0.71**
Treatment Group	-1.69	0.79	-0.20*

Note. TMS-S= Toronto Mindfulness Scale-State; TMS-T= Toronto Mindfulness Scale-Trait; Treatment Group (Distraction coded as 0, Mindfulness coded as 1); STAI-S = State Trait Anxiety Inventory- State Form; PANAS-NA= Negative Affect Subscale of the Positive and Negative Affect Schedule.

* $p < .05$. ** $p < .001$.

Table 4

*Hierarchical Regression Analyses for State Curiosity (Mindfulness)
Predicting State Anxiety and State Negative Affect*

	<i>B</i>	<i>SE B</i>	β
STAI-S (Time 3) ^a			
Step 1			
STAI-S (Time 2)	0.54	0.07	0.66**
Step 2			
STAI-S (Time 2)	0.52	0.07	0.64**
TMS-S-Curiosity (Time 3)	-2.76	1.15	-0.21*
Step 3			
STAI-S (Time 2)	0.56	0.07	0.69**
TMS-S-Curiosity (Time 3)	-2.02	1.18	-0.16
Treatment Group	-4.55	2.28	-0.19
PANAS-NA (Time 3) ^b			
Step 1			
PANAS-NA (Time 2)	0.31	0.04	0.66**
Step 2			
PANAS-NA (Time 2)	0.31	0.04	0.66**
TMS-S-Curiosity (Time 3)	-0.32	0.42	-0.07
Step 3			
PANAS-NA (Time 2)	0.33	0.04	0.71**
TMS-S-Curiosity (Time 3)	-0.07	0.43	-0.02
Treatment Group	-1.65	0.84	-0.19

Note. TMS-S-Curiosity = Toronto Mindfulness Scale-State-Curiosity Subscale; Treatment Group (Distraction coded as 0, Mindfulness coded as 1); STAI-S = State Trait Anxiety Inventory- State Form; PANAS-NA = Negative Affect Subscale of the Positive and Negative Affect Schedule.

^aFor STAI-S (Time 3): $R^2 = .436$ for Step 1 ($p < .001$); $\Delta R^2 = .045$ for Step 2 ($p = 0.019$); $\Delta R^2 = .029$ for Step 3 ($p = ns$). ^bFor PANAS-NA (Time 3): $R^2 = .434$ for Step 1 ($p < .001$); $\Delta R^2 = .005$ for Step 2 ($p = ns$); $\Delta R^2 = .031$ for Step 3 ($p = ns$)
* $p < .05$. ** $p < .001$.

Table 5

*Hierarchical Regression Analyses for State Decentering (Mindfulness)
Predicting State Anxiety and State Negative Affect*

	<i>B</i>	<i>SE B</i>	β
STAI-S (Time 3) ^a			
Step 1			
STAI-S (Time 2)	0.54	0.07	0.66**
Step 2			
STAI-S (Time 2)	0.53	0.07	0.65**
TMS-S-Decenter (Time 3)	-5.29	1.21	-0.36**
Step 3			
STAI-S (Time 2)	0.56	0.07	0.69**
TMS-S-Decenter (Time 3)	-4.70	1.24	-0.32**
Treatment Group	-3.56	2.09	-0.14
PANAS-NA (Time 3) ^b			
Step 1			
PANAS-NA (Time 2)	0.31	0.04	0.66**
Step 2			
PANAS-NA (Time 2)	0.31	0.04	0.66**
TMS-S-Decenter (Time 3)	-1.39	0.45	-0.27*
Step 3			
PANAS-NA (Time 2)	0.32	0.04	0.69**
TMS-S-Decenter (Time 3)	-1.21	0.47	-0.23*
Treatment Group	-1.12	0.79	-0.13

Note. TMS-S-Decenter = Toronto Mindfulness Scale-State-Decentering Subscale; Treatment Group (Distraction coded as 0, Mindfulness coded as 1); STAI-S = State Trait Anxiety Inventory- State Form; PANAS-NA = Negative Affect Subscale of the Positive and Negative Affect Schedule.

^aFor STAI-S (Time 3): $R^2 = .436$ for Step 1 ($p < .001$); $\Delta R^2 = .126$ for Step 2 ($p < .001$); $\Delta R^2 = .018$ for Step 3 ($p = ns$). ^bFor PANAS-NA (Time 3): $R^2 = .434$ for Step 1 ($p < .001$); $\Delta R^2 = .070$ for Step 2 ($p = .003$); $\Delta R^2 = .015$ for Step 3 ($p = ns$).

* $p < .05$. ** $p < .001$.

APPENDIX A: SELF-STATEMENTS IN DEPENDENCY INDUCTION

1. I am weak and powerless
2. My close friends are likely to abandon me
3. I have very little control over what happens in my life
4. People will reject me for who I am
5. Other people see how self-conscious I am in social situations
6. I am likely to end up alone later in life
7. I don't have what it takes to be a good leader. I will always be weak and a follower
8. By my mid 20s most of my relationships will have drifted away
9. I can't rely on myself because I'm a worthless person
10. I will lose the love and support of those who are closest to me
11. I'm unable to deal with my personal problems
12. I know that deep-down, most people don't like me
13. Later in life, I won't have that one special person to be close with
14. I'm almost always weak and passive around others
15. I am a helpless person who will always be fragile and insecure
16. People that I love will desert me sooner or later

APPENDIX B: NEUTRAL IDEAS IN DISTRACTION CONDITION

1. A freshly painted door
2. Containers have blue lids
3. Digital clocks are common
4. A shopping cart
5. He stands on the deck
6. Four drawers are in the cabinet
7. She sees a rug on the floor
8. A busy marketplace
9. Lots of bins are in the room
10. Our body is made of water
11. Red pipes are metallic
12. This is a garbage can
13. Some tablecloths are in the basket
14. A folded green towel
15. A shiny yellow toy
16. Her book is under the bed
17. The earth is round
18. Music sheets are on the stand
19. A leather wallet
20. A girl with binoculars
21. The dark blue water flowed over the rocks

22. A dining room chair
23. A package of mozzarella cheese
24. The tennis ball was served across the net
25. The farmer began harvesting the corn
26. A candle on a bookcase
27. The number four
28. Where is 2nd Street?
29. The mirror is on the wall
30. A blue pen
31. The door is open
32. He is going to the store
33. The television is in the living room
34. A different land
35. The following day
36. Tall mountains
37. The group formed three lines
38. The word "table" was written in red font
39. He went into town
40. A ceramic mug

Thesis and Dissertation Services