

# Mindfulness Therapy for Maladaptive Interpersonal Dependency: A Preliminary Randomized Controlled Trial

Andrew S. McClintock

Timothy Anderson

Saryn Cranston

Ohio University

Existing treatments for maladaptive interpersonal dependency and dependent personality disorder do not meet basic scientific standards for effectiveness. The present investigation tested the efficacy of a mindfulness-based approach: mindfulness therapy for maladaptive interpersonal dependency (MT-MID). Forty-eight participants who reported consistently high levels of maladaptive dependency (i.e., scored higher than 1 standard deviation above the mean on the Interpersonal Dependency Inventory at two separate assessments) were randomized to either 5 sessions of MT-MID or a minimal contact control. Five self-reported outcomes (mindfulness, maladaptive interpersonal dependency, helplessness, fears of negative evaluation, and excessive reassurance seeking) were assessed at pretreatment, posttreatment, and a 4-week follow-up. Intent-to-treat analyses indicated that MT-MID yielded greater improvements than the control on all 5 outcomes at posttreatment (median  $d = 1.61$ ) and follow-up (median  $d = 1.51$ ). Participants assigned to MT-MID were more likely than control participants to meet criteria for clinically significant change at posttreatment (56.5% vs. 0%) and follow-up (42.9% vs. 0%). There was also evidence that increases in mindfulness mediated the dependency-related improvements. These results provide preliminary support for the efficacy of a mindfulness-based approach for treating the symptoms of maladaptive dependency.

**Keywords:** mindfulness; mindfulness therapy; interpersonal dependency; dependent personality disorder; randomized controlled trial

This research was funded by Ohio University's Original Work Grant. Address correspondence to Andrew S. McClintock, Ohio University, 247 W. Union St. #304C, Athens, OH 45701; e-mail: [am248310@ohio.edu](mailto:am248310@ohio.edu).

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THERE IS A BURGEONING INTEREST in transdiagnostic approaches to treating mental disorders (McEvoy, Nathan, & Norton, 2009). Transdiagnostic protocols cut across current diagnostic categories and target the common elements (e.g., emotional dysregulation, behavioral avoidance, social skills deficits) of psychological disorders (Barlow, Allen, & Choate, 2004). Treatments that address transdiagnostic factors may prove to be more efficient and effective than therapies designed to treat specific disorders (Barlow et al., 2004; McEvoy et al., 2009).

One transdiagnostic factor that should be a focus of psychological treatment is maladaptive interpersonal dependency (MID). MID is a personality syndrome characterized by the tendency to overrely on others for nurturance, support, and guidance (Bornstein, 2012; McClintock, McCarrick, Anderson, Himawan, & Hirschfeld, in press). MID entails *cognitive* symptoms (e.g., the perception of oneself as weak and helpless, along with the perception of others as strong and powerful), *affective* symptoms (e.g., fears of negative evaluation, fears of abandonment), and *behavioral* symptoms (e.g., passivity, submissiveness, reassurance seeking) (Bornstein, 2012).

Research indicates that MID plays a role in various forms of psychopathology, including depression, social anxiety, panic, disordered eating, substance abuse, borderline personality disorder, and especially dependent personality disorder (Bornstein, 2005, 2012; Bornstein, Becker-Maturo, Winarick, & Reichman, 2010; Cogswell, Alloy, Karpinski & Grant, 2010; Disney, 2013; McClintock et al., in press; Shahar, 2008). MID might be a stable vulnerability factor for these conditions, as MID levels can remain high even after a disorder has remitted (Franche & Dobson, 1992). MID is also robustly linked to

functional impairment ( $r = 0.27$ ; Bornstein, 2012) and self-harm (Cohen's  $d = 0.64$ ; Klonsky, Oltmanns, & Turkheimer, 2003). Loas and colleagues (2005) found that self-reported MID predicted both suicidal ideation and suicide attempts in clinical and nonclinical participants, and Bornstein and O'Neill (2000) found, in a sample of psychiatric inpatients, that MID predicted suicidal behavior and physician ratings of current suicidality, even when controlling for depressive symptoms. Moreover, individuals with MID visit health care providers more frequently (Bornstein, 2012) and are hospitalized for a greater number of days (Porcerelli et al., 2009), suggesting that MID burdens the health care system as a whole.

Although MID is involved in multiple types of psychopathology and has severe ramifications, there are currently no treatments for MID or dependent personality disorder (DPD) that can be designated as efficacious (Bornstein, 2004; Disney, 2013; Dixon-Gordon, Turner, & Chapman, 2011; Perry, 2007). Indeed, Division 12 of the American Psychological Association, which is tasked with identifying treatments that have strong or even moderate empirical support, does not currently recommend a treatment for MID or DPD. The paucity of effective therapies in this area underscores the need for treatment development.

To maximize the effectiveness of a new treatment, attempts should be made to match specific treatment techniques to the core features of MID. Based on extant literature (Benjamin, 1996; Bornstein, 2005; Millon, 2003), we propose that the core feature of MID is the habitual tendency to devalue oneself while highly valuing other people. Specifically, individuals with MID seem to underappreciate their own thoughts, feelings, and moment-to-moment experiences, and instead navigate their lives by relying on close others (Benjamin, 1996; Bornstein, 2005; McClintock et al., in press; Millon, 2003). Thus, a primary goal of the current treatment is to help individuals with MID to value and appreciate themselves and their own internal experiences.

One skill that might facilitate progress in this regard—and has been successfully used to treat disorders associated with MID (Goldin & Gross, 2010; Hofmann, Sawyer, Witt, & Oh, 2010; Khoury et al., 2013)—is mindfulness. Bishop and colleagues (2004) posit two components of mindfulness: (a) self-regulation of attention on immediate experience and (b) an orientation toward one's experience that is characterized by curiosity, openness, and acceptance. The first component in Bishop et al.'s (2004) definition refers to focusing attention on present-moment experience, a process that would allow for increased recognition of mental events (e.g., thoughts, feelings) as they occur. The second

component implies that these arising mental events would be seen as relevant, important, and worthy of observation (Bishop et al., 2004). That is, mindfulness practice could foster not only a greater awareness of internal experience but also a greater appreciation and kindness toward that experience (Kabat-Zinn, 2013). Based on this model, we would predict that through sustained mindfulness practice, individuals with MID would become more inclined to value and trust in their own experiences, reducing the need to overrely on other people.

Although mindfulness techniques are highly effective for a variety of problems (e.g., Khoury et al., 2013) and fit well with our conceptualization of MID, there has been only one study (McClintock & Anderson, 2015) that has investigated the application of mindfulness for MID. In that study, dependency-related distress was induced in 70 highly dependent participants who were then randomized to either a brief mindfulness intervention or a distraction intervention. As predicted, participants in the mindfulness intervention reported a greater reduction in dependency-related distress than participants in the distraction intervention, and this distress reduction was mediated by state levels of mindfulness. Although these results are encouraging, McClintock and Anderson (2015) studied changes in state-based constructs; research is needed to examine the impact of mindfulness therapy on MID traits and behaviors.

#### RESEARCH OBJECTIVES AND HYPOTHESES

In this research, we developed mindfulness therapy for maladaptive interpersonal dependency (MT-MID), an approach that utilizes mindfulness techniques to decrease MID symptoms. We tested the effects of MT-MID on five outcome variables: (a) mindfulness, (b) MID, (c) helplessness (i.e., a cognitive symptom of MID), (d) fears of negative evaluation (i.e., an affective symptom of MID), and (e) excessive reassurance-seeking (i.e., a behavioral symptom of MID).

Following the deployment-focused model of intervention development and testing (Weisz, Jensen, & McLeod, 2005), we conducted a randomized controlled trial (RCT) in which participants were randomly assigned to either MT-MID or a minimal contact control. Weisz and colleagues (2005) also recommended that an initial RCT should enroll individuals who are mildly to moderately symptomatic. Accordingly, the current study enrolled university students who reported consistently high levels of MID (i.e., scored higher than one *SD* above the mean on a MID questionnaire at two separate occasions).

The hypotheses for this study were: (1) Participants in MT-MID would report higher levels of mindfulness (1a) and lower levels of MID (1b), helplessness (1c), fears of negative evaluation (1d), and excessive

reassurance-seeking (1e) at posttreatment and 4-week follow-up, relative to control participants; (2) Changes in mindfulness from pre- to posttreatment would mediate the improvements in MID (2a), helplessness (2b), fears of negative evaluation (2c), and excessive reassurance-seeking (2d).

### Method

#### PARTICIPANTS

To be eligible for this study, undergraduate participants had to score higher than one standard deviation above the mean on the Interpersonal Dependency Inventory (IDI; Hirschfeld et al., 1977) at a screening assessment and a pretreatment assessment (see Procedure). The final, randomized sample ( $N = 48$ ) reported a mean IDI score (72.06;  $SD = 7.39$ ) at pretreatment that approached the normative two standard deviations above the mean (73.97; McClintock & Anderson, 2015).

These 48 participants were either in their freshman (54.2%), sophomore (31.2%), junior (12.5%), or senior year (2.1%) of college, with a mean age of 19.0 years ( $SD = 0.9$ ). Most (85.4%) identified as female. About 85.4% of participants identified as White/Caucasian, 6.3% identified as Black or African American, 4.2% identified as Multiracial, and 4.2% identified as Hispanic or Latino/Latina. The vast majority of participants (95.8%) identified as heterosexual, with 4.2% identifying as bisexual. About 56.2% of participants reported that they were single/dated casually, 41.7% reported involvement in a long-term relationship, and 2.1% reported that they were engaged/married. Most participants (89.6%) had never practiced mindfulness. We found that 27.1% of participants were currently receiving psychological treatment at the pretreatment assessment (14.6% reported psychopharmacological treatment only, 6.2% reported psychotherapy only, and 6.2% reported both psychopharmacological treatment and psychotherapy), although we did not assess the frequency or course of these concurrent treatments.

#### MEASURES

*Five Facet Mindfulness Questionnaire (FFMQ; Baer, Smith, Hopkins, Krietemeyer, & Toney, 2006)*

The FFMQ is a 39-item measure of dispositional mindfulness that contains five subscales: Observing, Describing, Acting with Awareness, Nonjudging, and Nonreactivity. Items (example item: “*I watch my feelings without getting lost in them*”) are rated on a scale from 1 (*never or very rarely true*) to 5 (*very often or always true*). The FFMQ has demonstrated convergent validity with other mindfulness measures, divergent validity with measures of thought suppression and absentmindedness, and test-retest reliability

(ICCs  $> 0.60$ ) over a 2-week interval (Baer et al., 2006; Baer et al., 2008; Veehof et al., 2010). The FFMQ is appropriate for use among both meditating and nonmeditating samples (Baer et al., 2006, 2008). In the current study, acceptable levels of internal consistency were found for the FFMQ (Cronbach  $\alpha = 0.73$ ) and its subscales (Cronbach  $\alpha$  ranged from 0.74–0.93).

*Interpersonal Dependency Inventory (IDI; Hirschfeld et al., 1977)*

The IDI is one of the most widely used measures of maladaptive interpersonal dependency (Bornstein, 2012). The 48 IDI items (example item: “*I would be completely lost if I didn’t have someone special.*”) are rated on a 4-point Likert scale anchored with the terms “Not characteristic of me” (1) to “Very characteristic of me” (4). The full-scale IDI (34 items summed, 14 subtracted; see Bornstein, 2005) has been found to be stable ( $r = .71$ ) over an 84-week interval (Bornstein, 1997), which is consistent with IDI’s purported measurement of a personality trait. The IDI is strongly correlated with other measures of maladaptive dependency (e.g., Cogswell et al., 2010) and predicts dependency-related behaviors, DPD symptoms, and decreases in social support over time (Bornstein, 2005; Loas et al., 2002; Shahar, 2008). While the full-scale IDI has sound psychometric properties, recent results by our research team (McClintock et al., in press) imply that the individual subscales (see Hirschfeld et al., 1977) should not be interpreted. Thus, we examined the full-scale IDI only. Normative data have been obtained for the IDI ( $M = 44.85$ ;  $SD = 14.56$ ; see McClintock & Anderson, 2015). Like past research, the IDI had an acceptable level of internal consistency in the present sample (Cronbach  $\alpha = 0.76$  at pretreatment).

*Helplessness, Hopelessness, and Haplessness Scale–Helplessness Subscale (HHH-H; Lester, 2001)*

The HHH-H is a 10-item, self-report questionnaire assessing perceived helplessness. The HHH-H has a Likert-type response format ranging from 1 (strongly disagree) to 6 (strongly agree). A typical item from the HHH-H is “*I rarely feel in control of my life.*” Research indicates that HHH-H is related yet distinct from measures of hopelessness, haplessness, and suicidal ideation (Lester, 2001; Lester & Walker, 2007), is stable over a 3-week interval ( $r = 0.73$ ; Vatan, Ertas, & Lester, 2011), and is strongly associated with maladaptive dependency (McClintock et al., in press). Normative data are available for interpreting HHH-H among college students ( $M = 25.3$ ,  $SD = 7.3$ ; Lester & Walker, 2007). The HHH-H exhibited an acceptable level of internal consistency in the current study (Cronbach  $\alpha = 0.75$  at pretreatment).

*Fear of Negative Evaluation Scale–Brief (FNEB; Leary, 1983)*

The FNEB is a self-report measure assessing fears of negative evaluation. The FNEB contains 12 items, with are rated on a 5-point Likert-type scale anchored with the terms “Not at all characteristic of me” (1) to “Extremely characteristic of me” (5). A typical item is “*I am afraid that people will find fault with me.*” Convergent and discriminant validity for the FNEB is strong (Collins et al., 2005). For example, McClintock and colleagues (2014) reported a high correlation between FNEB and a measure of maladaptive dependency. A test-retest correlation coefficient ( $r$ ) of 0.94 was reported over a 2-week interval (Collins et al., 2005) and 0.75 over a 4-week interval (Leary, 1983). Normative data are available for interpreting FNEB among college students ( $M = 35.7$ ,  $SD = 8.1$ ; Leary, 1983). The internal consistency of the FNEB was acceptable in the current study (Cronbach  $\alpha = 0.73$  at pretreatment).

*Excessive Reassurance-Seeking Scale (ERSS; Joiner, Alfano, & Metalsky, 1992)*

The ERSS is a 4-item self-report questionnaire measuring excessive reassurance-seeking, the relatively stable tendency to seek assurances from others that one is lovable and worthy (Joiner & Metalsky, 2001). Each ERSS item (example item: “*In general, do you find yourself often asking the people you feel close to how they truly feel about you?*”) is rated on a 7-point Likert scale, which ranges from “no, not at all” (1) to “yes, very much” (7). The ERSS has good construct validity (Joiner et al., 1992; Joiner & Metalsky, 2001). ERSS scores have been shown to be positively associated with observer-rated reassurance-seeking behavior (Joiner & Metalsky, 2001) and maladaptive dependency (McClintock, McCarrick, & Anderson, 2014; McClintock et al., in press). Although there is a dearth of research on the test-retest reliability of the ERSS, the underlying construct of excessive reassurance-seeking appears to be stable over a 1-month period ( $r = 0.84$ ; Coughle et al., 2012). Joiner and Metalsky (1995) reported a mean (8.64) and standard deviation (3.92) for a large sample of undergraduate students. The ERSS had good internal consistency in the present sample (Cronbach  $\alpha = 0.89$  at pretreatment).

#### PROCEDURE

This study was conducted in the psychology department of a large Midwestern university during the 2014–2015 academic year. IRB approval was obtained, and all ethical standards were followed; no adverse events were reported throughout the duration of the study. An intended sample size of 48 participants was derived from a power analysis using

a large effect size (see Roemer, Orsillo, & Salters-Pedneault, 2008). See Fig. 1 for a procedure flow chart.

We recruited students with maladaptive dependency via the psychology department’s web-based screening system. Specifically, we added the IDI to this screening system and selected only those students who scored higher than one standard deviation above the mean (i.e.,  $> 59.41$ ). This cutoff value (59.41) was derived from normative IDI data collected from 1,221 undergraduates (see McClintock & Anderson, 2015).

Of the 1,797 students who completed the IDI in the screening system ( $M = 44.42$ ,  $SD = 15.31$ ), 292 (16.2%) scored higher than the cutoff, and only this subsample of students was eligible and could sign up for the laboratory phase of the current study. The laboratory portion of this study was advertised via the psychology department’s web-based system; to avoid sample biases, no references were made to mindfulness or interpersonal dependency.

After reserving time slots online, 60 students arrived individually to a psychotherapy laboratory on the university’s campus. All 60 participants provided informed consent; participants were told that the aim of this study was to test the efficacy of a treatment on “psychological well-being,” and that they would be randomly assigned to either the treatment or an “alternative activity.”

A battery of study measures (see Measures), which included the IDI, was then administered for the pretreatment assessment (this battery of measures was later readministered for the posttreatment assessment and 4-week follow-up assessment). At this pretreatment assessment, 12 participants did not score higher than one standard deviation above the mean on the IDI (i.e., scored  $\leq 59.41$ ). These participants were immediately deemed ineligible (and no additional data were collected) so as to maintain the integrity of the sample. Thus, to be eligible for this study, participants ( $N = 48$ ) had to score higher than one standard deviation above the mean on the IDI at both the screening assessment and pretreatment assessment (time between these assessments ranged from 2 days to 7 weeks). These 48 participants were randomly assigned to either MT-MID ( $n = 24$ ; see MT-MID condition) or a minimal contact control ( $n = 24$ ; see Control condition); the first author determined condition assignment using a table of random numbers, while forcing even distribution in each block of 12 participants.

Both treatment conditions were approximately 4 weeks in duration. One MT-MID participant dropped from the study after the third session (did not return phone calls/emails), while the remaining 23 MT-MID participants completed all treatment sessions and the posttreatment assessment (see Measures). One control

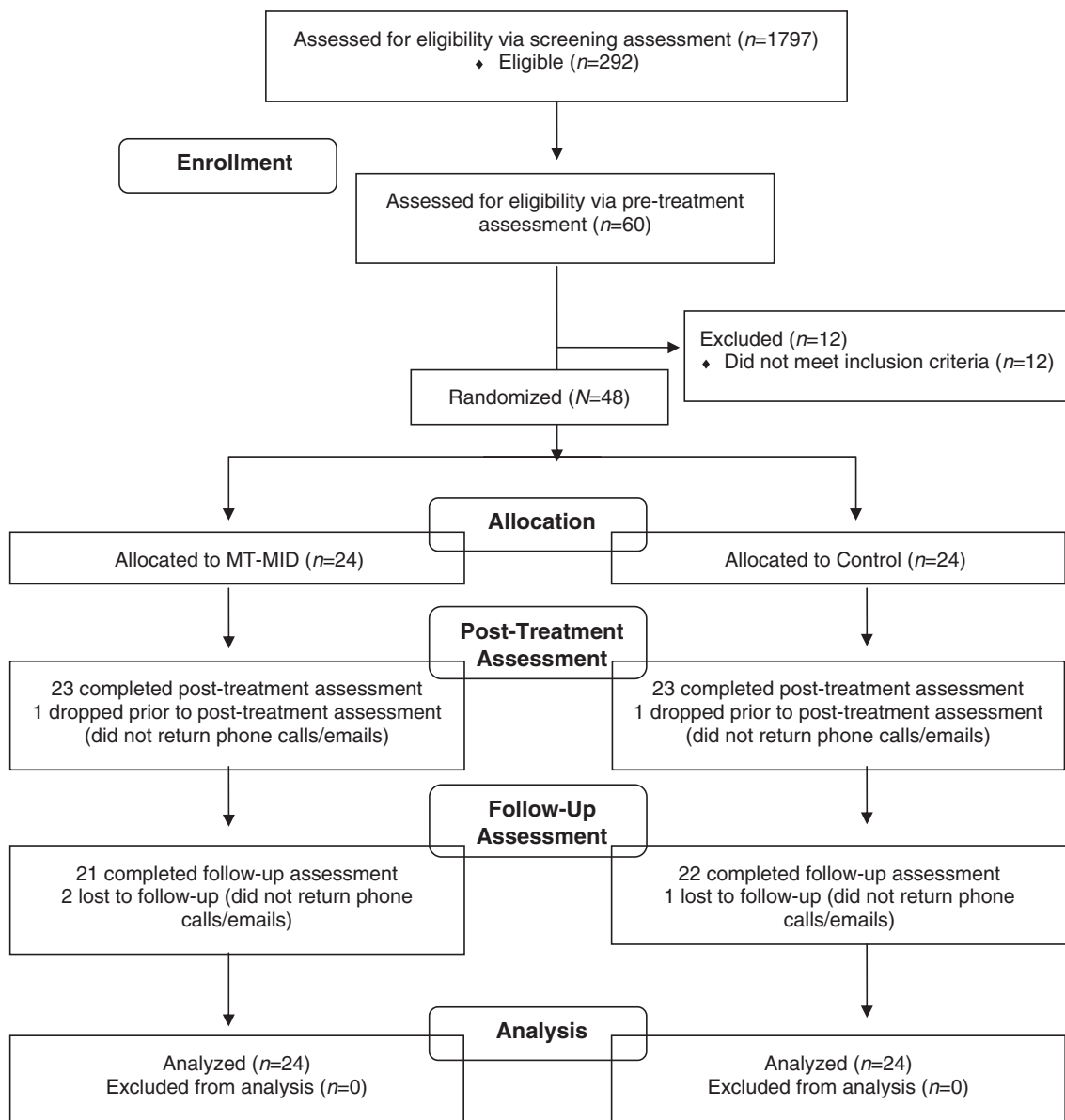


FIGURE 1 Procedure flow chart.

participant dropped from the study (did not return phone calls/emails), while the remaining 23 control participants completed the posttreatment assessment (see Measures). For both conditions, the posttreatment assessment was administered in the psychotherapy laboratory.

These 46 participants (MT-MID  $n = 23$ , control  $n = 23$ ) were later contacted and asked to return to the psychotherapy laboratory for the 4-week follow-up assessment. Two participants in the MT-MID condition and 1 participant in the control condition did not return phone calls/emails. The remaining 43 participants (MT-MID  $n = 21$ , control  $n = 22$ ) completed the 4-week follow-up assessment (see Measures) and were compensated with \$10 and five

and half course credits (partial credit was awarded for partial participation).

#### TREATMENT CONDITIONS

##### *Control Condition*

To maintain equitable compensation with the MT-MID condition, a control condition was designed that entailed approximately 5.5 hours of research participation, yet involved minimal contact with study personnel; immediately after the pretreatment assessment, control participants received a homework assignment to write brief summaries of five research articles. These articles pertained to quantitative/qualitative methodologies and did not reference mindfulness, dependency, or other mental-health-

related issues (control participants were not informed about the study's focus on mindfulness and maladaptive dependency until debriefing at end of study). Control participants were instructed to bring in their summaries for the posttreatment assessment. After completing the 4-week follow-up assessment, these participants were invited to take part in MT-MID.

*MT-MID.* Immediately after the pretreatment assessment, participants assigned to MT-MID completed the first treatment session. In total, these participants were seen individually for five 50-min sessions, which were delivered weekly in the psychotherapy laboratory (i.e., treatment duration  $\approx$  4 weeks). MT-MID was limited to five sessions to reduce burden on clients and therapists; brief mindfulness treatments have been shown to be effective in past research (see Carmody & Baer, 2009).

MT-MID,<sup>1</sup> a manualized, skills-based treatment, was most heavily inspired by mindfulness-based stress reduction (MBSR; Kabat-Zinn, 2013) and dialectical behavior therapy (DBT; Linehan, 1993). As akin to MBSR and DBT, clients in MT-MID were taught formal (e.g., sitting meditation) and informal mindfulness techniques (e.g., mindfulness of current emotions); these techniques were practiced in each session and were assigned as homework at the end of each session to facilitate the application of mindfulness skills into day-to-day life.

The rationale for MT-MID is built on the observation that individuals with MID devalue themselves while highly valuing other people (e.g., see Bornstein, 2005). Thus, mindfulness techniques were incorporated into MT-MID to assist dependent clients in valuing and appreciating themselves and their own internal experiences. The primary tasks for the five MT-MID sessions are as follows:

- Session 1: Participant discusses dependency-related problems and is experientially introduced to mindfulness practice.
- Session 2: Participant brings mindfulness to thoughts.
- Session 3: Participant brings mindfulness to emotions.
- Session 4: Participant learns to be mindful during interpersonal interactions.
- Session 5: Participant deepens mindfulness practice to aid in the prevention of maladaptive dependency relapse.

*MT-MID Therapists.* Each client assigned to MT-MID received treatment from one of four therapists. Clients were assigned to therapists based on therapist availability. Consequently, there was some variability in the number of clients seen by each therapist (one therapist saw eight clients, one saw seven clients, another saw five clients, and the final therapist saw four clients). All four therapists were in their 5th year of a clinical psychology Ph.D. program. Three therapists were Caucasian males, and the fourth was a Caucasian female, and they ranged in age from 26 to 29 years ( $M = 27.75$ ;  $SD = 1.26$ ). With regard to previous therapy experience, therapists reported a mean of 633.75 direct clinical hours ( $SD = 358.50$ ). Two therapists identified CBT as their predominant theoretical orientation, and the other two identified as eclectic. All four therapists had experience delivering mindfulness-based treatments ( $M = 23.75$  clinical hours;  $SD = 18.87$ ). One therapist reported that he did not have a personal meditation practice, two therapists reported practicing meditation about once per week, and the fourth therapist reported a daily meditation practice. When asked about allegiance toward mindfulness-based treatments, the four therapists reported a mean rating of 3.25 ( $SD = 0.96$ ) on a 5-point Likert scale (1 = *not at all*, 5 = *completely*).

One of the therapists was the principal investigator (first author) of this research and led a 2-day training designed to increase adherence to the MT-MID manual. Training entailed didactic instruction on maladaptive interpersonal dependency, DPD, and MT-MID, as well as interactive role-plays of each MT-MID session. Therapists engaged in and received feedback about their role-plays, until each therapist was deemed competent in MT-MID methods (i.e., adequately delivered each task of each MT-MID session).

All MT-MID sessions were audiotaped for use in weekly supervision. In supervision, the principal investigator facilitated discussion of MT-MID cases, as well as challenges that arose when implementing the MT-MID manual.

*Treatment Fidelity and Between-Session Practice.* The audiotapes were also used to evaluate treatment fidelity and clients' between-session mindfulness practice. To conduct the fidelity assessment, the principal investigator (and author of MT-MID manual) first identified the essential tasks of each session (e.g., discussion of dependency-related cognitions; mindful raisin-eating exercise; mindfulness of current emotions). Next, a second study therapist reviewed all of the audio recordings and determined that 97.9% of the essential tasks had been addressed in the sessions. This therapist also

<sup>1</sup> For a copy of MT-MID manual, please contact first author.

used the recordings to assess clients' between-session mindfulness practice (no/little practice coded as 0, some practice coded as 0.5, and substantial practice coded as 1). As prescribed by the MT-MID manual, between-session mindfulness practice was discussed at the beginning of Sessions 2 through 5 (possible range of practice ratings for entire treatment = 0–4;  $M = 3.52$ ;  $SD = 0.59$ ). As an accuracy check, the principal investigator rated a subsample (15%) of the audiotapes; across the two evaluators, there was 96.0% agreement on treatment fidelity ratings and 92.7% agreement on between-session practice ratings.

#### OVERALL ANALYTIC PLAN

We examined treatment effects with intent-to-treat analyses (ITT; i.e., all randomized participants,  $N = 48$ ). We also conducted completer analyses; because ITT results and completer results were virtually identical, only the ITT results are presented here.<sup>2</sup> ITT analyses were conducted with the use of SPSS Missing Value Analysis to impute missing posttreatment ( $n = 2$ ) and follow-up ( $n = 5$ ) data using the expectation-maximization method (Dempster, Laird, & Rubin, 1977; for an example, see Bohlmeijer, Fledderus, Rokx, & Pieterse, 2011). This method computes missing values based on maximum likelihood estimates using observed data in an iterative process (Dempster et al., 1977). Analyses that are performed with this method often assume that missing data are missing at random; Little's MCAR test indicated that the data were, in fact, missing at random,  $\chi^2 = 6.33$ ,  $p = .98$ .

To assess differences on demographic and pretreatment outcome data, independent samples  $t$  tests and chi-square tests of independence were used. We employed a repeated measures MANOVA to determine if there was a significant change on the five outcomes (FFMQ, IDI, HHH-H, FNEB, ERSS) over time between MT-MID and control. Time (pretreatment, posttreatment, follow-up) was entered as a within-subjects factor and treatment condition (MT-MID vs. control) was entered as a between-subjects factor. To explore significant effects, one-way ANCOVAs were conducted for the five outcomes at posttreatment and follow-up with pretreatment scores as covariates. Both within-group and between-groups effect sizes were calculated. Within-group effect sizes were calculated as the difference in the pretest and posttest means divided by the pooled standard deviation, correcting for the dependence between means (see Morris & DeShon, 2002). Between-groups effect sizes were calculated as the

difference in the posttest means divided by the pooled standard deviation (Cohen, 1988). To interpret Cohen's  $d$ , an effect size of  $d = .2$  was considered small,  $d = .5$  was considered medium, and  $d = .8$  was considered large (Cohen, 1988).

To examine whether changes in mindfulness across treatment would mediate the effects of treatment condition (i.e., MT-MID vs. control) on outcomes, a series of bootstrap (data-resampling) analyses were conducted. Specifically, an analysis was conducted for each of the four dependency-related outcomes (IDI, HHH-H, FNEB, ERSS) at posttreatment and follow-up. Treatment condition was entered as the independent variable, change in FFMQ from pre- to posttreatment was entered as the potential mediator, and a posttreatment or follow-up outcome index was entered as the dependent variable (with corresponding pretreatment scores entered as a covariate). These bootstrap analyses were conducted with the Preacher and Hayes (2008) INDIRECT Macro. This macro generates bias-corrected bootstrap confidence intervals (CIs) for testing the statistical significance of the indirect effect. The 95% CI for the estimate of the indirect effect was obtained with 5000 bootstrap resamples. If the CI does not include zero, it can be concluded that the mediated pathway is statistically significant at the .05 level (Preacher & Hayes, 2008).

#### Results

##### PRELIMINARY ANALYSES

Of all the items on the collected measures, less than 0.02% had a missing value. These missing values were replaced using mean of nearby points. No problems were found when checking for normality and outliers. At pretreatment, MT-MID participants and control participants did not significantly differ ( $p$  values  $> .05$ ) on any of the demographics (including concurrent psychological treatment) and pretreatment outcomes, implying that randomization was successful.

To assess if MT-MID outcomes ( $n = 24$ ) varied by therapist ( $n = 4$ ), an ANCOVA was conducted for each posttreatment outcome with pretreatment scores as covariates. Therapists were entered as a random factor. These ANCOVAs indicated that therapists did not significantly differ on any of the posttreatment outcomes (all  $p$  values  $> .05$ ).

##### TREATMENT OUTCOME ANALYSES

A repeated measures MANOVA showed that there was a significant Time by Treatment condition interaction, Wilks' Lambda = 0.39,  $F(10, 37) = 5.84$ ,  $p < .001$ . Fig. 2 illustrates the changes in maladaptive dependency (IDI) from pretreatment to posttreatment to follow-up by treatment condition.

<sup>2</sup> Please contact first author for results of completer analyses.

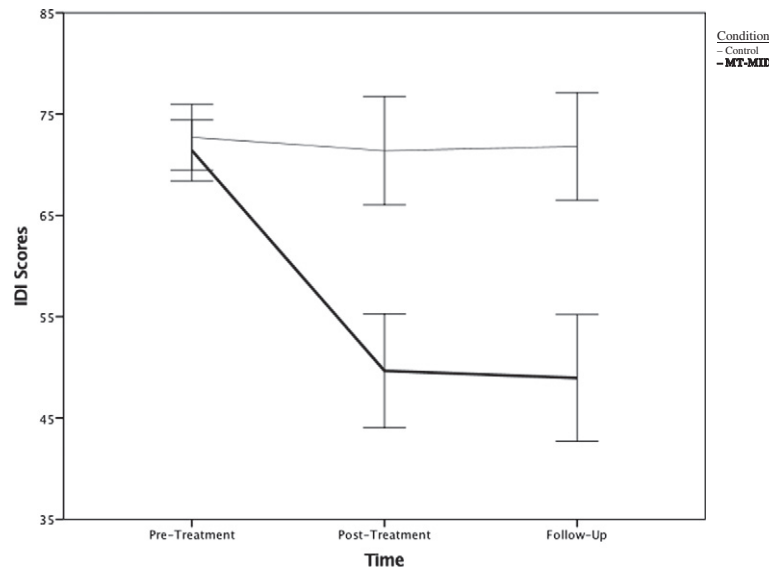


FIGURE 2 Changes in Interpersonal Dependency Inventory (IDI) scores with 95% confidence intervals by treatment condition.

### Posttreatment Outcomes

To test effects at posttreatment, a series of one-way ANCOVAs were conducted. Levene's test implied that the homoscedasticity assumption was violated for the IDI outcome. Therefore, for this outcome, we used Hayes and Cai's (2007) HCREG Macro to conduct a heteroskedasticity-robust regression with the HC3 estimator (independent variables = pretreatment scores and treatment condition; dependent variable = posttreatment scores). When control-

ling for pretreatment scores, participants in MT-MID reported significantly higher FFMQ (mindfulness) scores and significantly lower IDI (maladaptive dependency), HHH-H (helplessness), FNEB (fears of negative evaluation), and ERSS (excessive reassurance-seeking) scores at posttreatment, as compared to control participants. Between-groups results are presented in Table 1. Within-group, pre- to posttreatment effect sizes were calculated for the MT-MID group for the five outcomes: FFMQ ( $d = 1.61$ ), IDI

Table 1  
Means and Standard Deviations for Measures and Results of ANCOVAs and Cohen's  $d$  for Treatment Effects,  $N = 48$

Measures	MT-MID		Control		$F$	$p$	$d$	95% CI
	$M$	$SD$	$M$	$SD$				
FFMQ Pre	120.12	20.96	112.37	16.18				
FFMQ Post	143.95	18.50	112.12	15.81	64.14	<.001	1.85	1.15 to 2.49
FFMQ FU	144.53	21.70	113.94	17.86	32.53*	<.001	1.54	0.87 to 2.16
IDI Pre	71.42	7.14	72.71	7.73				
IDI Post	49.65	13.28	71.39	12.67	33.33*	<.001	1.68	0.99 to 2.30
IDI FU	48.95	14.84	71.80	12.57	33.72*	<.001	1.66	0.98 to 2.29
HHH-H Pre	30.00	9.33	32.83	7.49				
HHH-H Post	20.41	6.79	31.79	8.60	37.00	<.001	1.47	0.81 to 2.08
HHH-H FU	21.12	7.55	30.18	7.40	21.52	<.001	1.21	0.58 to 1.81
FNEB Pre	48.42	9.05	50.29	5.66				
FNEB Post	37.33	7.28	49.48	7.81	39.94	<.001	1.61	0.93 to 2.23
FNEB FU	36.21	9.02	49.09	8.05	36.60	<.001	1.51	0.84 to 2.12
ERSS Pre	16.79	6.60	17.29	5.64				
ERSS Post	11.62	4.88	17.44	5.28	22.06	<.001	1.14	0.52 to 1.73
ERSS FU	12.00	5.86	16.47	6.44	7.92	.007	0.73	0.13 to 1.30

Note. FFMQ = Five Facet Mindfulness Questionnaire, IDI = Interpersonal Dependency Inventory, HHH-H = Helplessness, Hopelessness, and Helplessness Scale-Helplessness Subscale, FNEB = Fear of Negative Evaluation Scale-Brief, ERSS = Excessive Reassurance-Seeking Scale, Pre = pre-treatment, Post = post-treatment, FU = follow-up, CI = confidence interval.

$d$  = Absolute value of Cohen's  $d$ ; between group comparison

\* calculated with heteroskedasticity-robust regression method (Hayes & Cai, 2007).

( $d = 1.60$ ), HHH-H ( $d = 1.54$ ), FNE ( $d = 1.42$ ), and ERSS ( $d = 0.85$ ).

#### Follow-up Outcomes

One-way ANCOVAs were also used to test effects at follow-up. Levene's test implied that the homoscedasticity assumption was violated for FFMQ and IDI outcomes. Therefore, for these outcomes, we utilized the aforementioned heteroskedasticity-robust regression method (Hayes & Cai, 2007). When controlling for pretreatment scores, participants in MT-MID reported significantly higher FFMQ (mindfulness) scores and significantly lower IDI (maladaptive dependency), HHH-H (helplessness), FNEB (fears of negative evaluation), and ERSS (excessive reassurance-seeking) scores at follow-up, as compared to control participants. Between-groups results are presented in Table 1. Within-group, pretreatment to follow-up effect sizes were calculated for the MT-MID group for the five outcomes: FFMQ ( $d = 1.47$ ), IDI ( $d = 1.62$ ), HHH-H ( $d = 1.33$ ), FNE ( $d = 1.57$ ), and ERSS ( $d = 0.74$ ).

#### MEDIATION ANALYSES

Bootstrap analyses indicated that the effect of treatment condition through change in FFMQ was significant for improvements in IDI ( $B = -10.63$ , 95% CI = -19.09 to -2.59), HHH-H ( $B = -4.42$ , 95% CI = -7.86 to -1.25), FNEB ( $B = -6.13$ , 95% CI = -11.48 to -2.00), and ERSS ( $B = -2.84$ , 95% CI = -4.95 to -0.19) at posttreatment. A second set of bootstrap analyses indicated that the effect of treatment condition through change in FFMQ was significant for improvements in IDI ( $B = -9.83$ , 95% CI = -17.88 to -2.22), HHH-H ( $B = -3.46$ , 95% CI = -7.35 to -0.39), FNEB ( $B = -6.07$ , 95% CI = -10.92 to -2.25), and ERSS ( $B = -3.32$ , 95% CI = -6.25 to -0.42) at follow-up. Of note, when change in FFMQ was entered as a dependent variable, and outcome improvements were entered as potential mediators, the bootstrap analyses yielded nonsignificant results. These results imply that changes in mindfulness mediated changes in the dependency-related outcomes (but not vice versa).

#### SUPPLEMENTARY ANALYSES

To examine treatment effects on the specific facets of mindfulness, one-way ANCOVAs were conducted for the five FFMQ subscales at posttreatment and follow-up with pretreatment scores as covariates ( $N = 48$ ). When controlling for pretreatment scores, participants in MT-MID reported significantly higher FFMQ-Observing ( $F = 31.25$ ,  $p < .001$ ), FFMQ-Describing ( $F = 7.01$ ,  $p = .011$ ), FFMQ-Acting with Awareness ( $F = 21.00$ ,  $p < .001$ ), FFMQ-Nonjudging ( $F = 32.90$ ,  $p < .001$ ), and FFMQ-Nonreactivity

( $F = 49.23$ ,  $p < .001$ ) at posttreatment, as compared to control participants. Similarly, when controlling for pretreatment scores, participants in MT-MID reported significantly higher FFMQ-Observing ( $F = 10.00$ ,  $p = .003$ ), FFMQ-Describing ( $F = 13.12$ ,  $p = .001$ ), FFMQ-Acting with Awareness ( $F = 15.95$ ,  $p < .001$ ), FFMQ-Nonjudging ( $F = 28.71$ ,  $p < .001$ ), and FFMQ-Nonreactivity ( $F = 26.52$ ,  $p < .001$ ) at follow-up, as compared to control participants.

To assess clinically significant change, we adapted procedures used by Roemer et al. (2008) and others (Borkovec, Newman, Pincus, & Lytle, 2002; Hayes-Skelton, Roemer, & Orsillo, 2013; Newman et al., 2011). Roemer and colleagues (2008) reported two separate measures of clinically significant change: responder status (symptom reduction  $\geq 20\%$  on at least three of four measures) and high end-state functioning (within one  $SD$  of published norms on at least three of four measures). Participants in the current study only need to score higher than one  $SD$  above the mean (at two assessments) to be enrolled, and so Roemer et al.'s (2008) threshold of high end state functioning could potentially be reached, in the current study, with a small degree of change. Therefore, we incorporated both responder status and high end-state functioning into a single, but more restrictive, measure of clinically significant change (i.e., symptom reduction  $\geq 20\%$  and within one  $SD$  of published norms on at least three of four measures). The four measures in this analysis were the four dependency-related outcomes (IDI, HHH-H, FNEB, and ERSS). About 56.5% of MT-MID participants (13/23) and 0% of control participants (0/23) met criteria for clinically significant change at posttreatment,  $\chi^2 = 18.12$ ,  $p < .001$ . About 42.9% of MT-MID participants (9/21) and 0% control participants (0/22) met criteria for clinically significant change at follow-up,  $\chi^2 = 11.92$ ,  $p = .001$ .

Finally, we aimed to evaluate whether between-session mindfulness practice in the completer MT-MID group ( $n = 23$ ) was a significant predictor of the five outcomes (FFMQ, IDI, HHH-H, FNEB, ERSS). Thus, a series of regression analyses were conducted with between-session practice ratings as the predictor and a posttreatment index as the criterion (corresponding pretreatment scores were entered as a predictor to partial out their effects). Between-session mindfulness practice did not predict improvements in any of the outcomes (all  $p$  values  $> .05$ ).

#### Discussion

The current study tested the efficacy of a relatively brief mindfulness therapy (MT-MID) for reducing the symptoms of maladaptive interpersonal dependency

(MID). Results implied that MT-MID outperformed a minimal contact control by producing statistically and clinically significant effects on MID-related outcomes (i.e., MID, helplessness, fears of negative evaluation, and excessive reassurance-seeking) at posttreatment and 4-week follow-up. The proposed mechanism of change in MT-MID was supported, as changes in mindfulness mediated the MID-related improvements.

Large between-groups effect sizes ( $d_s = 1.14$  to  $1.85$  at posttreatment) were found for MT-MID in the current research, with 56.5% of MT-MID participants meeting criteria for clinically significant change at the end of treatment. Ideally, these findings would be compared to those obtained using similar samples. However, at present, there is a void of rigorous, controlled research on the treatment of MID and dependent personality disorder (DPD) (Disney, 2013; Dixon-Gordon et al., 2011; Perry, 2007). Our preliminary results help to address this gap in the literature by implicating mindfulness therapy in the treatment of dependency-related problems. Because dependency-related problems span an array of disorders, including anxiety and depressive disorders (e.g., Bornstein, 2005), the potential application of this treatment is broad and far-reaching. Future research should investigate if MT-MID can be successfully transported to other clinical settings and contexts.

We predicted that MT-MID would allow individuals with MID to be more mindful and appreciative of their moment-to-moment thoughts and feelings, resulting in MID symptom reductions. Bootstrap analyses provided preliminary support for this theorized mechanism of change; increases in mindfulness mediated improvements in maladaptive dependency, helplessness, fears of negative evaluation, and excessive reassurance-seeking. These results are consistent with previous work (e.g., Baer, Carmody, & Hunsinger, 2012) and imply that increases in mindfulness may have been a primary reason why MT-MID was effective.

Although changes in mindfulness may have played a mediating role, clients' between-session mindfulness *practice* was found to be unrelated to treatment outcomes. Between-session practice was rated as 0 (*no/little practice*), 0.5 (*some practice*), or 1 (*substantial practice*), and these ratings were summed across Sessions 2 through 5 (range for entire treatment = 0 to 4). The nonsignificant results for this variable may be due to a restricted range or ceiling effect, as the average MT-MID participant achieved a practice rating of 3.52 ( $SD = 0.59$ ). Moreover, this measure of practice frequency does not capture the rich and potentially profound experience of mindfulness practice, and so our null

results should be interpreted with caution. The value of at-home mindfulness practice has received mixed results in previous research (Vettese, Toneatto, Stea, Nguyen, & Wang, 2009). One way to advance this line of research is to measure between-session practice in terms of both frequency and quality of practice.

#### LIMITATIONS

There are a number of limitations associated with the current research. Perhaps most significant is that participants were not screened or assessed for a formal clinical disorder (e.g., DPD). That is, in this initial efficacy trial, we adhered to the deployment-focused model of intervention development and testing (Weisz et al., 2005) by enrolling individuals who reported relatively high levels of MID at two assessments. The interval between these two assessments was longer for some participants (e.g., > 1 month) and, unfortunately, shorter for others (e.g., < 1 week). Of note, our sample's mean of 72.06 on the IDI at pretreatment approached the normative two standard deviations above the mean (i.e., 73.97; see McClintock & Anderson, 2015). Although pretreatment IDI scores were high relative to normative data, it remains unclear to what extent these scores are clinically meaningful (for a discussion, see Disney, 2013), and so until additional data become available, the current results should not be generalized to impaired, severely symptomatic clients.

The present sample was also a relatively homogeneous group of White, female college students, thereby limiting the conclusions that can be made about the efficacy of MT-MID with men, racially diverse groups, and noncollege students. As discussed by Disney (2013), the treatment of DPD in men presents unique challenges because dependent men may be "especially reluctant to discuss their feelings, due to thinking [their] feelings are unacceptable, or a fear of being judged by the therapist" (p. 1193). Caution is also warranted when attempting to generalize the current findings to individuals in other age groups because dependency seems to manifest differently across the lifespan (Bornstein, 2005). Clearly, empirical efforts are needed to evaluate the replicability and generalizability of the present findings.

Another shortcoming is that our therapists were relatively inexperienced in terms of clinical work generally ( $M$  clinical hours = 633.75) and mindfulness-based treatments specifically ( $M$  clinical hours = 23.75). Therapists espoused either an eclectic or general CBT orientation, with only a moderate allegiance toward mindfulness interventions ( $M = 3.25$  on 5-point Likert scale). Further, at the outset of the study, only one of the four therapists practiced mindfulness regularly (i.e., > once per week), which is

discordant with Kabat-Zinn's (2013) recommendation that those who teach mindfulness should have an extensive, personal meditation practice. It stands to reason that MT-MID would have demonstrated even greater efficacy if delivered by more experienced and allegiant therapists.

There were other design/measurement issues as well. First, all of the data were assessed with self-report measures, and so shared method variance and social desirability factors may have influenced our results. Second, although adherence ratings implied that MT-MID was delivered with a high level of fidelity, nonallowable behaviors (e.g., cognitive restructuring techniques) were not identified or assessed. Third, adherence was rated by a participating therapist, which may have introduced bias particularly in the ratings of her own sessions. This concern is somewhat mitigated, however, by the accuracy check conducted by a second rater. Fourth, we did not assess for competence in the delivery of MT-MID. Fifth, although we assessed for concurrent treatment at the pretreatment assessment and found that the two conditions did not differ, we did not assess for the frequency or course of concurrent treatment. Sixth, participants were compensated (with money and course credit), which is unusual in intervention research and might have affected our results. Finally, our control condition involved little contact with study participants and was merely designed to control for the passage of time (e.g., changes due to maturation, regression to the mean, spontaneous remission). A more methodologically sound study would have controlled for nonspecific factors (e.g., credibility of treatment, expectations, social desirability, interaction with a caring therapist, expression of emotional material). Because these factors were not controlled in the current research, it remains unclear to what degree the observed treatment effects are attributable to nonspecific factors versus specific factors (e.g., mindfulness techniques). Future investigations should compare MT-MID to active treatments and should incorporate longer follow-up periods.

Another avenue for research is to examine client characteristics and process variables that might moderate response to MT-MID. That is, MT-MID is presumably more effective for some clients, and in some contexts, than it is for others. Indeed, 43.5% of participants in the current study did not experience clinically significant change by the end of MT-MID. What differentiates responders from nonresponders remains unknown, although based on our experiences with these clients, we would submit that those who thrived in this treatment were the same clients who tended to be conscientious, disciplined, and thoroughly engaged in the

purposive work of therapy. Future research might examine whether these characteristics predict MT-MID outcomes.

## Conclusions

The current findings provide initial support for the efficacy of a mindfulness-based approach (MT-MID) for treating the symptoms of MID. This is noteworthy because empirically supported treatments for MID and DPD do not currently exist. It is our hope that the demonstrable effects of MT-MID in the present research will spur efforts to improve the care and treatment provided to individuals with dependency-related concerns.

## Conflict of Interest Statement

The authors declare that there are no conflicts of interest.

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