

## Discomfort with Emotion Moderates Distress Reduction in a Brief Mindfulness Intervention

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### Abstract

The goal of this study was to investigate moderators of mindfulness training. The present study employed a brief form of mindfulness training with moderately distressed participants. Psychological distress was measured before and after a five-session mindfulness intervention. Two hypothesized moderators of treatment outcome, discomfort with emotion and mindfulness were measured before the intervention. Consistent with previous research, the brief mindfulness intervention was associated with reductions in psychological distress with a large pre-post effect size. Importantly, reductions in distress were significantly moderated by discomfort with emotion. Individuals reporting the most discomfort with emotion showed less reduction in distress after the mindfulness intervention. Results highlight the importance of investigating moderators of mindfulness intervention outcome.

### Keywords

emotion, mindfulness, moderators, psychological distress

Mindfulness has been defined as paying deliberate attention to present-moment phenomena (e.g., thoughts, emotions, sensations) with acceptance and non-judgment (e.g., Bishop et al., 2004; Kabat-Zinn, 1990). Mindfulness training has been adapted to a wide variety of clinical conditions and has been associated with numerous beneficial outcomes, including decreased distress (e.g., Astin, 1997; Carmody & Baer, 2009; Reibel, Greeson, Brainard, & Rosenzweig 2001), prevention of relapse in individuals who have had three or more depressive episodes (e.g., Teasdale et al., 2000) and reduction of worry in generalized anxiety disorder (Roemer & Orsillo, 2007; Roemer, Orsillo, & Salters-Pedneault, 2008).

Mindfulness interventions usually last for approximately 8 weeks, including the Mindfulness-Based Stress Reduction (MBSR; Kabat-Zinn, 1990) and Mindfulness-Based Cognitive Therapy (MBCT; Segal, Williams, & Teasdale, 2002) models. MBSR typically consists of approximately 26 hours, including eight classes of 2.5 hours and an additional 6 hour class (Carmody & Baer, 2009). While an 8-week intervention is not an uncommon intervention length in therapy contexts, the time demands associated with such an intervention can be taxing and are sometimes cited as a prohibitive factor for individuals declining to participate in mindfulness training (e.g., Minor, Carlson, Mackenzie, Zernicke, & Jones, 2006).

It is therefore not surprising that brief mindfulness interventions have been developed that either do not require as much in-session time or are held over a shorter length of time. For example, in an attempt to make mindfulness training available to busy medical staff, a pilot study adapted MBSR to four sessions, held over 4 weeks (Mackenzie, Poulin, & Seidman-Carlson, 2006). In comparison to a wait-list control group, participants in the mindfulness intervention reported improvements in burnout symptoms, relaxation, and life satisfaction. A recent randomized clinical trial adapted MBSR to four 1.5

hour sessions for health sciences students (Jain et al., 2007). Pre-post distress levels were significantly reduced in the shortened MBSR group compared to the control group (Cohen's  $d = 1.36$ ). Finally, in a study of university faculty and staff, MBSR was adapted to six, 1 hour weekly sessions and was compared to a wait-list control group. Significant reductions in perceived stress and increases in mindfulness occurred only in the group receiving mindfulness training (Klatt, Buckworth, & Malarkey, 2009). In fact, in a recent review of published studies that have adapted MBSR to shorter formats, there was no evidence that shortened versions of MBSR were less effective than longer formats in reducing psychological distress (Carmody & Baer, 2009).

Establishing the efficacy of mindfulness interventions has been a primary focus of previous research (for reviews see Baer, 2003; Grossman, Niemann, Schmidt, & Walach, 2004). In contrast, the important question of who benefits the most (and least) from mindfulness interventions has to our knowledge, received remarkably little attention. Treatment moderators specify for whom or under what conditions an intervention works (Hollon et al., 2002; Kraemer, Wilson, Fairburn, & Agras, 2002), and can therefore clarify for whom interventions are most appropriate. In one recent randomized clinical trial for individuals with rheumatoid arthritis, a mindfulness-based intervention was compared with: (a) cognitive behavioral therapy emphasizing pain management; and (b) an arthritis education curriculum. The relative value of the interventions was moderated by depression history. Individuals with a previous history of depression exhibited significantly greater improvements from the mindfulness intervention relative to the other interventions (Zautra et al., 2008). However, not all individuals with a history of depression benefit equally from mindfulness interventions. For example, MBCT is associated with reduced risk for relapse in individuals with a history of three or more (but not one

or two) depressive episodes (Teasdale et al., 2000; Ma & Teasdale, 2004), illustrating that mindfulness interventions are not "one size fits all."

The present study examined who benefits the most (and least) from a brief mindfulness intervention. One of the potential moderators we examined, discomfort with emotional experience<sup>1</sup> as measured by the Affective Control Scale (ACS, Williams, Chambless, & Ahrens, 1997), is associated with psychopathology (e.g., generalized anxiety disorder and depression; Roemer, Salters, Raffa, & Orsillo, 2005; Liverant, Brown, Barlow, & Roemer, 2008). While discomfort with emotion can decrease over the course of an acceptance-based intervention (e.g., Roemer & Orsillo, 2007), to our knowledge, no previous studies have investigated the role of discomfort with emotion as a moderator of distress reduction in clinical interventions (including mindfulness interventions).

Mindfulness interventions emphasize allowing internal phenomena (such as emotions, thoughts, and somatic sensations) to arise, while observing these phenomena nonjudgmentally without trying to change them. Salters-Pedneault, Gentes, and Roemer (2007) found that women who reported greater discomfort with emotions also reported more negative affect and psychological distress in response to an upsetting film clip. Individuals who feel considerable distress while experiencing emotions may avoid or have more difficulty remaining in contact with such emotions as they arise than individuals who feel mild distress (e.g., Hayes, Wilson, Gifford, Follette, & Strosahl, 1996; Williams et al., 1997). Because individuals who have greater discomfort with emotions may be less inclined to remain in contact with emotional phenomena, and doing so is part of mindfulness interventions, we hypothesized that individuals who experience more discomfort with emotion would benefit less from a brief mindfulness intervention than those with less discomfort with emotion.

We also examined whether baseline levels of mindfulness would moderate distress reduction. In one study, greater increases in self-reported mindfulness in individuals who completed MBSR training were associated with greater decreases in psychological distress (Carmody & Baer, 2008). We therefore explored whether baseline levels of mindfulness would moderate distress reduction from pre-post intervention. We hypothesized that higher levels of baseline mindfulness would be associated with greater reductions in distress.

<sup>1</sup> Although the researchers who developed the ACS initially described it as a measure of fear of emotions, fewer than half of the items refer to fear, worry, or anxiety about emotions, with the majority of items describing a variety of forms of discomfort (e.g., "I feel comfortable that I can control my level of anxiety" and "I would be embarrassed to death if I lost my temper in front of other people").

**Table 1.** Overview of Mindfulness Intervention Sessions

	Theme	Exercises
Week 1	Introduction to mindfulness	Raisin exercise (Kabat-Zinn, 1990) Basic sitting practice with awareness of body sensations and the breath (Segal et al., 2002)
Week 2	Thoughts	Watching thoughts like a movie (Segal et al., 2002) Basic sitting practice with awareness of thoughts
Week 3	Emotions	Body Scan (Kabat-Zinn, 1990) Basic sitting meditation with awareness of emotion
Week 4	Compassion	Lovingkindness meditation (Kabat-Zinn, 1990)
Week 5	Integration / Wrap-up	Walking meditation (Kabat-Zinn, 1990)

## Method

### Participants

Participants were 24 (21 female) adults (mean age = 44, SD = 12.4), 83% Caucasian, recruited via an advertisement in an electronic newsletter distributed to university staff. An additional two individuals qualified for the study but dropped out of the intervention following the first session due to a death in the family ( $n=1$ ), and child care responsibilities ( $n=1$ ). They are not included in the present sample of 24 individuals. Participants were divided into three groups of 8 participants in order to provide an optimal climate for participation. The recruitment advertisement invited participants to learn meditation skills that could help one "...become more aware and accepting of life's experiences." Interested individuals contacted the investigators and were screened with the Brief Symptom Inventory-18 (BSI-18; Derogatis, 2001), an 18-item inventory designed to assess psychological distress in community and clinical samples. Individuals who scored between the 66-95<sup>th</sup> percentile (moderate range) of distress were eligible to participate (raw score of 9-25 for women and 9-23 for men). Nine individuals scored below the 66<sup>th</sup> percentile and were not eligible to participate, but were provided with a resource list of local group opportunities that included a mindfulness component (e.g., meditation groups). One individual scored above the 95<sup>th</sup> percentile and was therefore ineligible (this individual was already receiving mental health services and did not need referrals prepared for high scorers). All individuals were screened by phone with the screening module and relevant follow-up modules from the Structured Clinical Interview for DSM-IV Axis I Disorders – Non-Patient Edition (SCID-NP; First, Spitzer, Gibbon, & Williams, 1997). Based on the screening and follow up modules of the SCID, none of the participants met criteria for: (a) a current mood episode (i.e. a major depressive episode, current manic or hypomanic episode); (b) symptoms of psychosis; or (c) current substance dependence. All participants were at least 18 years of age and provided informed consent to participate in the research.

### Instruments

The BSI-18 is intended as a screening instrument for psychological distress in community and medical populations across three domains: anxiety, depression, and somatization. The scale consists of 18 items ranging from (0) "not at all" to (4) "always," and instructions ask individuals how they have been feeling "during the past 7 days." Sample items include, "Feeling so restless you couldn't sit still," "Feeling no interest in things," and "Pains in heart or chest." Higher scores reflect greater levels of distress. The BSI-18 has been found to have good internal consistency (Zabora et al., 2001) and adequate convergent and discriminant validity (Derogatis, 2001).

Participants who qualified for the present study completed the BSI-18 immediately before the first mindfulness session (session one, internal consistency measured using Cronbach's  $\alpha = .81$ ) and immediately before the final mindfulness session (session five, Cronbach's  $\alpha = .87$ ). Change in BSI score was used to measure the degree to which individuals benefitted from the mindfulness intervention.

Participants completed several questionnaires approximately 1 week before the intervention began, which were used as potential moderators of who would benefit the most from the present brief mindfulness intervention (Kraemer et al., 2002). The first potential moderator was the Affective Control Scale (ACS; Williams et al., 1997), which is a measure of discomfort with emotion across four domains of anger, positive affect, depressed mood, and anxiety. The scale consists of 42 items ranging from (1) "very strongly disagree" to (7) "very strongly agree." Sample items include, "I am concerned that I will say things I'll regret when I get angry," "I can get too carried away when I am really happy," "Depression could really take me over, so it is important to fight off sad feelings," and "I get so rattled when I am nervous that I cannot think clearly." Higher scores reflect higher discomfort with emotion. The ACS has been found to have good internal consistency, test-retest reliability, and construct validity (Williams et al., 1997). In the present sample, internal consistency measured using Cronbach's  $\alpha$  was .94.

The second potential moderator was the Five Facet Mindfulness Questionnaire, or FFMQ (Baer, Smith, Hopkins, Krietemeyer, & Toney, 2006). This instrument was derived from a factor analysis of questionnaires measuring a trait-like general ten-

dency to be mindful in daily life. The scale consists of 39 items on a Likert scale that ranges from (1) = "never or very rarely true" to (5) "very often or always true." Items were grouped into five factors: (a) nonreactivity to inner experience, (b) observing or noticing thoughts, feelings, sensations and perceptions; (c) acting with awareness, (d) describing/labeling with words, and (e) nonjudging of experience. Sample items include "I watch my feelings without getting lost in them," "I notice the smells and aromas of things," "I find it difficult to stay focused on what's happening in the present," "I can usually describe how I feel at the moment in considerable detail," and "I criticize myself for having irrational or inappropriate emotions." The FFMQ has shown good internal consistency and construct validity (Baer et al., 2006; Baer, et al., 2008). In the present sample, internal consistency measured using Cronbach's  $\alpha$  was .92.

The third potential moderator was the Mindful Attention Awareness Scale, or MAAS (Brown & Ryan, 2003). The MAAS measures a general tendency to be attentive to and aware of moment-by-moment experiences. The scale has 15 items ranging from (1) almost always to (6) almost never, with higher scores indicating more mindfulness. Sample items include, "I could be experiencing some emotion and not be conscious of it until some time later," "I tend not to notice feelings of physical tension or discomfort until they really grab my attention," "I do jobs or tasks automatically, without being aware of what I'm doing," and "I snack without being aware that I'm eating." The MAAS has shown good internal consistency, test-retest reliability, as well as good convergent and discriminant validity (Brown & Ryan, 2003). In the present sample, internal consistency measured using Cronbach's  $\alpha$  was .87.

### Mindfulness intervention procedures

The mindfulness intervention consisted of five 75-minute sessions held over 2.5 weeks, adapted from MBSR and MBCT, and facilitated by authors EA and SS (who had consistent personal meditation practices for more than 3 years). An overview of the sessions is presented in Table 1. Participants attended an average of 4.5 ( $SD = 0.8$ ) sessions (min = 3, max = 5). Participants were strongly encouraged to practice mindfulness between group sessions, but such practice was not mandatory. Total reported between-sessions practice was 7.0 sessions ( $SD = 4.5$ ) across the entire intervention. Participants were given guided mindfulness meditation CDs with: (a) a 10, 20, and 30 minute basic sitting meditation practice (recorded by EA); (b) a 20 minute body scan meditation (recorded by EA); and (c) a 20 minute lovingkindness meditation (recorded by SS).

## Results

To examine whether distress levels changed over the course of the brief mindfulness intervention, a paired t-test was conducted using BSI-18 scores as the dependent variable. As expected, scores decreased over the duration of the inter-

vention (pre  $M = 12.7$ ,  $SD = 5.0$ , post  $M = 8.3$ ,  $SD = 6.2$ ),  $t(23) = 4.46$ ,  $p < .01$ , reflecting a large effect size (Cohen's  $d = .79$ ).

To examine whether self-reported measures of acceptance of emotion or mindfulness moderated reductions in psychological distress, a repeated-measures ANCOVA was conducted with time (pre, post) as the repeated measure, and the pre-intervention moderator scores (ACS, MAAS, or FFMQ) as covariates. In the absence of other effects, an interaction of Time x ACS emerged,  $F(1, 20) = 4.73$ ,  $p < .05$ . For the purpose of illustrating the nature of the significant Time x ACS interaction, we present in Figure 1 the pre and post BSI scores of: (a) individuals whose ACS score fell below the median of 3.5 (labeled low ACS); and (b) individuals whose ACS score fell above the median (labeled high ACS). As expected, BSI scores decreased for those with ACS scores below the median ( $n=12$ , pre  $M = 12.3$ ,  $SD = 5.6$ , post  $M = 6.2$ ,  $SD = 6.2$ ),  $t(11) = 4.41$ ,  $p < .01$  (2-tailed). This effect was "large," Cohen's  $d = 1.03$ . In contrast, BSI scores did not significantly decrease for those with ACS scores above the median ( $n=12$ , pre  $M = 13.0$ ,  $SD = 4.6$ , post  $M = 10.3$ ,  $SD = 5.7$ ),  $t(11) = 2.12$ ,  $p > .05$ .

## Discussion

Consistent with previous research (for review see Carmody & Baer, 2009), participants reported less psychological distress after the mindfulness intervention, with a large pre-post effect size. More importantly, as hypothesized, we found that those individuals reporting the most discomfort with emotion showed less reduction in distress after a mindfulness intervention. This result makes sense conceptually, as individuals who experience greater discomfort with emotion may feel distress in the context of an intervention that encourages remaining in contact with (i.e., not avoiding) emotional phenomena. While this is the first study to show that discomfort with emotion moderates mindfulness treatment outcome, more research is needed to understand why. For example, the present study is unable to address whether individuals who express discomfort with emotions allowed emotional phenomena to arise or whether they successfully avoided such phenomena during mindfulness practice. Future research should systematically assess the quality and kind of emotional phenomena that are experienced during mindfulness practice amongst individuals reporting low and high levels of discomfort with emotion.

Given that the present intervention was brief, these findings raise the question of whether a longer intervention would be more appropriate for individuals reporting higher levels of discomfort with emotion. In one recent study, high levels of discomfort with emotion decreased over the course of an acceptance-based behavior therapy that lasted 16 sessions and was administered individually (Roemer & Orsillo, 2007). Longer interventions may therefore allow those with higher levels of discomfort with emotion to gradually become more comfortable with emotional phenomena. Once comfort

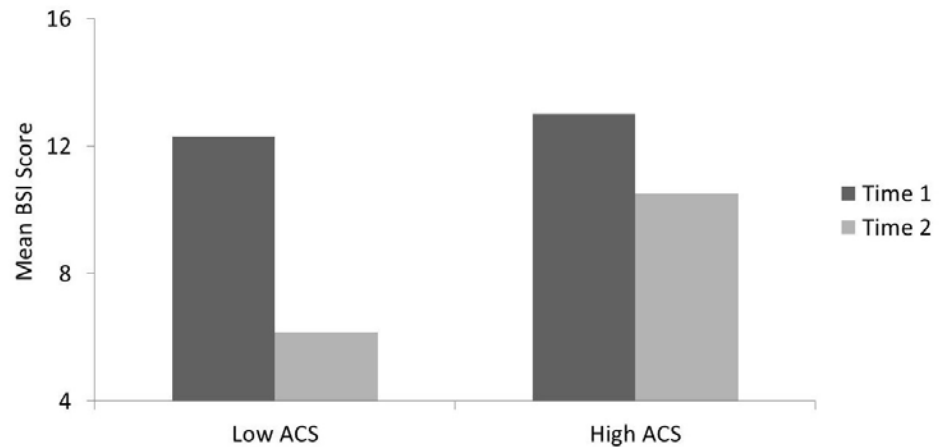


Figure 1. Distress reduction moderated by discomfort with emotion. Individuals with lower ACS scores showed a decrease in distress from pre ("Time 1")- to post ("Time 2")-intervention.

with emotion has increased, individuals may be ready to benefit from mindfulness interventions. Future research investigating discomfort with emotion as a moderator of distress during a longer mindfulness intervention thus appears a promising direction for future research. Conversely, briefer mindfulness interventions such as that adopted in the present study may be sufficient for individuals reporting low discomfort with emotion, and may indeed be preferable, given pragmatic constraints such as length of intervention as a barrier to participation (e.g., Minor et al., 2006).

Unlike discomfort with emotions, self-reported mindfulness did not moderate distress reduction. Given that participants reported a range of scores on both the FFMQ ( $M = 25.8$ ,  $SD = 3.4$ , range = 18-32) and MAAS ( $M = 3.7$ ,  $SD = 0.7$ , range = 2.3-5.2), the present results do not appear to be driven by a restriction in the range of self-reported mindfulness scores. One implication of these findings is that one's baseline level of mindfulness does not interfere with one's ability to benefit from a mindfulness intervention. This implication dovetails with a growing empirical base (e.g., Baer, 2003; Carmody & Baer, 2009; Roemer & Orsillo, 2007; Roemer et al., 2008; Teasdale, et al., 2000), showing that a wide range of individuals, with a wide variety of diagnoses (e.g., borderline personality disorder, depression, generalized anxiety disorder), benefit from mindfulness interventions, presumably irrespective of baseline self-reported mindfulness level. Future research might fruitfully examine other potential moderators of distress reduction in mindfulness interventions. For example, individuals exhibiting higher levels of experiential or behavioral avoidance may have an especially difficult time benefiting from mindfulness interventions (e.g. Hayes, et al., 1996).

A limitation of the present study was the absence of a control condition. It is therefore difficult to know if the reductions in distress that occurred among participants with low discomfort with emotion would have occurred spontaneously in a control condition, or whether the effect was specific to the mindfulness intervention. It will be valuable for future research to test whether discomfort with

emotion moderates distress reduction specifically in mindfulness interventions or whether this effect generalizes to a no-treatment control group or other interventions.

The present sample included community volunteers who reported moderate levels of general distress and were screened for current mood disorders, psychosis, and substance dependence. Future research should examine whether the present results would generalize to individuals reporting higher levels of baseline psychological distress and more acute symptoms. Future research might fruitfully explore brief mindfulness interventions with individuals in inpatient and outpatient settings, given the need for time-limited interventions and acute distress reduction in such contexts. Finally, future research should continue to highlight the role of moderators of mindfulness intervention outcome in order to further elucidate for whom interventions work best. Such research can enable clinicians to provide the best possible evidence-informed care.

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