



Mindfulness and emotional distress: The role of negatively biased cognition

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ABSTRACT

Mindfulness is a receptive attention to and awareness of events and experiences as they occur. A substantial body of literature supports the usefulness of mindfulness-based approaches for preventing or reducing emotional distress (e.g., depression and anxiety). However, mechanisms by which mindfulness produces these benefits are still being explored. Cognitive theories of emotional disorder implicate negatively biased cognition as a primary source of distress, and the theoretical literature on mindfulness suggests that it may reduce biased thoughts and judgments. Thus, the present research tested a mediation model in which less negatively biased cognition explains the inverse relation between mindfulness and emotional distress. Participants completed multiple standardized measures of trait mindfulness, negatively biased cognition, and emotional distress. The proposed relations between these constructs then were examined using structural equation modeling. Support was found for a partial mediation model, and possible alternative models were ruled out. These findings highlight a previously unidentified cognitive mechanism to explain the relation between mindfulness and reduced emotional distress. Specifically, mindfulness may reduce negative, maladaptive cognitive styles, which in turn may reduce predisposition to emotional disorders.

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1. Introduction

A substantial body of literature supports the usefulness of mindfulness-based approaches for preventing or reducing emotional distress such as depression or anxiety (cf. Brown, Ryan, & Creswell, 2007; Hofmann, Sawyer, & Fang, 2010). However, mechanisms by which mindfulness produces these benefits are still being explored. One possibility is that mindfulness may reduce the negative cognitive biases involved in emotional distress. The present research examined this proposed mechanism for the emotional benefits of mindfulness.

Mindfulness has been conceptualized as a receptive attention to and awareness of internal and external experiences as they occur (Brown & Ryan, 2003). Bishop et al. (2004) explain that mindfulness involves a metacognitive process of attention regulation that maintains a nonelaborative stance toward thoughts, feelings, and sensations as they unfold. Thoughts and feelings are simply noticed rather than being entertained or avoided automatically. Mindfulness can be conceptualized on a continuum of being more or less mindful, and it has been studied as a psychological trait on which individuals vary as well as a state or mode that can be heightened (e.g., Brown & Ryan, 2003).

The extant literature suggests that mindfulness is beneficial for well-being. Correlational studies have demonstrated that measures of trait mindfulness are associated with lower levels of psychological distress (e.g., depression, stress) and higher levels of psychological well-being (e.g., competence, vitality) (cf. Brown et al., 2007). Further, mindfulness-based interventions have been developed to increase trait mindfulness and address psychological disorders. Growing evidence supports the efficacy of these mindfulness-based treatments for preventing relapse of depression and its promise for anxiety disorders including generalized anxiety disorder (cf. Hofmann et al., 2010).

Mechanisms by which mindfulness leads to these benefits have begun to receive attention. One mechanism that has received some empirical support is decreased rumination (e.g., Coffey, Hartman, & Fredrickson, 2010; Ramel, Goldin, Carmona, & McQuaid, 2004). That is, mindfulness may decrease rumination, presumably through greater receptivity but less attachment to thoughts (Brown et al., 2007) thereby reducing the automatic, repetitive elaboration that promotes emotional distress. Mindfulness also appears to facilitate better emotion regulation, or less habitual reactivity to negative emotions, potentially enabling more effective and adaptive coping responses (Coffey et al., 2010). Both of these potential mediators involve *how* negative thoughts and feelings are processed, as opposed to altering the negativity of thought content. Indeed, it has been theorized that the benefits of mindfulness stem less from changing thoughts than from changing how individuals relate to

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their thoughts (cf. Ramel et al., 2004). However, the alteration of thought content (i.e., reduction of negatively biased cognitions) may in fact be a mechanism by which mindfulness reduces emotional distress. Emerging evidence does suggest that mindfulness may reduce negatively biased cognitions, which is particularly intriguing given that negatively biased cognitive content is a well-established cause of emotional distress in the clinical literature.

Cognitive theories of depression and anxiety emphasize a negatively biased, or maladaptive, cognitive style as a key aspect of depression (e.g., Beck, 1987) and anxiety (e.g., Riskind, 1997). Furthermore, evidence supports a causal role of negative cognitive styles in depression and anxiety. Using a prospective design, Alloy et al. (2006) demonstrated that negative inferential tendencies and dysfunctional attitudes predicted onset as well as higher lifetime prevalence of major depressive disorder. Additionally, a recent review concluded that cognitive changes, such as improvements in dysfunctional attitudes and attributions, resulting from cognitive therapy predict improvements in depressive symptoms (Garratt, Ingram, Rand, & Sawalani, 2007). Similarly, a cognitive style characterized by a sense of looming vulnerability (i.e., a dynamic sense of a risk that grows rapidly with time or proximity, and does not correspond to reality) may underlie many cognitive biases that have been implicated in anxiety, such as disproportionate allocation of attention to threats and interpretations biased toward danger (Riskind, Williams, Gessner, Chrosniak, & Cortina, 2000). Also, inducing such biases has been found to cause anxiety (Mathews & MacLeod, 2002).

Both theoretical and empirical work suggest that mindfulness may be associated with fewer negative cognitions; therefore, reduction of negatively biased cognition may be a mechanism by which mindfulness reduces emotional distress. However, this mechanism has not been tested. Segal, Williams, and Teasdale (2002) theorized that for depressed or anxious individuals, normal classification of incoming stimuli as pleasant or unpleasant can trigger mental proliferation, similar to mind-wandering, into biased elaborations such as distorted interpretations. Using mindfulness to reduce such mental proliferation and recognize such elaborations, fewer negatively biased cognitions may be affixed automatically to basic observations and more attention can be given to what is actually occurring, including positive and neutral experiences. As such, mindfulness may enable individuals to be less influenced by or susceptible to negativity biases.

In a recent study, a brief mindfulness induction as compared to a control condition resulted in less negativity bias on an objective measure of attitude formation, the formation of more positive attitudes, and greater endorsement of optimistic beliefs (Kiken & Shook, 2011). Two studies by Frewen, Evans, Maraj, Dozois, and Partridge (2008) found that individuals who reported higher levels of trait mindfulness also reported less frequent negative thoughts and less difficulty letting go of negative cognitions. After an 8-week mindfulness intervention, a clinical sample reported not only less rumination and symptoms of depression and anxiety but also fewer dysfunctional attitudes, a common measure of negatively biased cognition in emotional disorders (Ramel et al., 2004). Although the study suggested that improvements in dysfunctional attitudes may covary with improvements in emotional disorders, the reduction in dysfunctional attitudes was not tested as a mediator between the effect of the mindfulness intervention on depression and anxiety symptoms.

The relations between trait mindfulness, negatively biased cognition, and emotional distress were examined more directly in a recent cross-sectional study (Gilbert & Christopher, 2010). Participants completed self-report measures of trait mindfulness, negative cognitions characteristic of depression, and depression symptoms. Mindfulness was inversely related to negatively biased cognition, and trait mindfulness moderated the link between

depressed mood and negatively biased cognition. That is, mindfulness attenuated the link between depressive symptoms and negatively biased thoughts. Interestingly, however, a post hoc analysis revealed that mindfulness was a significant predictor of depressive symptoms only when not accounting for variance attributable to negatively biased cognition. In other words, mindfulness did not predict depressive symptoms above and beyond negatively biased cognition. These results collectively support that mindfulness is associated with less negatively biased cognition and emotional distress. Moreover, they suggest that the link between mindfulness and emotional distress may at least partially be accounted for by less negatively biased cognitions. However, a mediation model was not tested.

In sum, recent evidence suggests that mindfulness can reduce negatively biased cognition, and that this may be a mechanism through which mindfulness reduces emotional distress. This mechanism would align with evidence supporting cognitive theories of depression and anxiety, but negatively biased cognition has not been examined as a mediator between mindfulness and emotional distress. Thus, the present research tested this proposed mediation model using structural equation modeling.

2. Method

The purpose of the study was to test a model in which negatively biased cognition mediates the inverse relation between mindfulness and emotional distress. Although depression and anxiety are distinct disorders, both involve cognitive biases toward negativity. Further, measures of depression and anxiety often correlate and these disorders often are co-morbid (e.g., Cairney, Corna, Veldhuizen, Herrmann, & Streiner, 2008); likewise, measures of the negatively biased cognitions found in depression and anxiety tend to positively correlate (Safford, Alloy, Abramson, & Crossfield, 2007). Therefore, symptoms of depression and anxiety were considered together here as indicators of a larger construct of emotional distress; similarly, the negative cognitions associated with depressive and anxious tendencies were considered together as indicators of the larger construct of negatively biased cognition.

2.1. Participants and procedure

One hundred and eighty-one undergraduate psychology students participated for course credit (59% male; 55% White; $M_{\text{age}} = 19.4$, $SD = 3.4$). Sessions were run in groups of at most six participants. Upon arrival, participants were seated in individual cubicles. Participants completed the measures described below, along with some filler tasks. Participants then were debriefed, thanked, and dismissed.

2.2. Measures

2.2.1. Mindful Attention Awareness Scale (MAAS; Brown & Ryan, 2003)

The MAAS is a self-report measure of trait mindfulness. Participants indicate the extent to which they experience 15 statements ($\alpha = .91$; e.g., "I find it difficult to stay focused on what's happening in the present") from 1 (*almost always*) to 6 (*almost never*). Higher scores reflect higher mindfulness. Exploratory factor analysis with the 15 items indicated a single factor as dominant, based on a scree plot of eigenvalues. Given this support for unidimensionality, three indicators were created from the 15 scale items using a correlational algorithm aimed at maximizing both internal consistency within the indicators ($\alpha = .81$, $.81$, and $.73$) and uniformity among the indicators ($r = .74$, $.70$, and $.65$).

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