

ABSTRACT

The Effects of Internal and External Mindfulness on Anxiety

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Mindfulness is gaining popularity as an intervention useful for reducing anxiety symptoms. It is proposed that mindfulness-based interventions can be separated into two categories: internal and external mindfulness. These two types of mindfulness are predicted to differentially change focus of attention and anxiety symptoms. Baylor undergraduate students were randomly assigned to complete either a single session of an internal or external mindfulness-based task. As predicted, the two tasks led to different changes in focus of attention, with the internal mindfulness-based task causing self-focused attention and the external mindfulness-based task causing an external focus of attention. However, contrary to predictions, both tasks led to similar reductions in anxiety symptoms. Although these results suggest that internal and external forms of mindfulness are equally effective for reducing anxiety symptoms, the two types of mindfulness cause different changes in focus of attention. Clinicians interested in reducing self-focused attention might consider using an external mindfulness-based intervention.

Keywords: anxiety; mindfulness; self-focused attention

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THE EFFECTS OF INTERNAL AND EXTERNAL MINDFULNESS ON ANXIETY

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CHAPTER ONE

Anxiety

Anxiety can be defined as a sense of uncontrollability focused largely on possible future threats (Barlow, 2000). Anxiety is a near-universal experience, as most individuals experience anxiety at some point during their lifetime. Individuals who experience heightened anxiety, with the anxiety leading to distress or impairment, may meet diagnostic criteria for an anxiety disorder (American Psychiatric Association, 2013). Anxiety disorders are associated with a number of negative outcomes, including unemployment, physical health problems, and death (Bruce & Leaf, 1989; Ettner, Frank, & Kessler, 1997; Jayakody, Danzinger, & Kessler, 1998). Moreover, it is estimated that the economic burden associated with anxiety disorders ranges between 42 and 47 billion dollars annually (Dupont, Rice, & Miller, 1996; Greenberg, Sisitsky, & Kessler, 1999), although some researchers contend that these estimates are actually underestimates of the annual economic burden (Kessler & Greenberg, 2002). Unless treated, anxiety disorders tend to have chronic courses (Sherbourne, Wells, & Meredith, 1996).

Cognitive-behavioral therapy (CBT) interventions are widely used to treat anxiety disorders (Clark & Beck, 2010) and some researchers consider CBT interventions to be the gold standard group of interventions for the treatment of these disorders (Hofmann & Smits, 2008). Broadly speaking, the purpose of CBT interventions for anxiety disorders is to change negative thought processes that engender a sense of uncontrollability focused on perceived threats (i.e., anxiety; Barlow, 2000). Within CBT interventions for anxiety

disorders, negative thought processes are typically challenged via behavioral experiments in which an individual is exposed to feared stimuli (Clark & Beck, 2010). For example, an individual with a specific phobia might be asked to come into contact with a feared stimulus (e.g., snake) in order to challenge an associated negative thought process (e.g., overestimation of the likelihood of threat related to coming into contact with a snake; *any snake will harm me*). The existing literature strongly supports the use of CBT interventions in the treatment of anxiety disorders, as these interventions show medium sized effects in the reduction of anxiety symptoms (Hofmann & Smits, 2008).

Mindfulness

However, many individuals do not respond to or remain symptomatic after undergoing CBT interventions for anxiety disorders (Lanouette & Stein, 2010). Given such limitations of CBT interventions, researchers have sought to develop novel psychological treatments for anxiety disorders. One class of novel psychological interventions for anxiety disorders involves mindfulness. The most modern and widely accepted definition of mindfulness is Kabat-Zinn's (1994) definition that mindfulness involves "paying attention in a particular way, on purpose, in the present moment and nonjudgmentally" (p. 4). This definition emphasizes attending to emotions, sights, and sounds, but not judging these experiences as 'good' or 'bad' *per se*. Rather, mindfulness encourages individuals to only acknowledge their presence.

Broadly speaking, mindfulness practices involve paying attention to and observing external and internal stimuli in the present as they come and go. During a mindfulness practice, individuals often go through breathing exercises, body scans (e.g., being aware of different regions of your body and acknowledging how each region feels)

and sitting meditations, and Hatha yoga poses (Baer, 2003). The goal of these activities is to notice sensations, emotions, and thoughts in each moment, but not to become absorbed in them. Pursuant to this study, Hofmann, Sawyer, Witt, and Oh (2010) completed a meta-analysis and found that mindfulness-based interventions effectively reduce anxiety symptoms. Based on Hofmann et al.'s findings, mindfulness-based interventions could improve upon treatment outcomes for individuals suffering from anxiety disorders.

Self-Focused Attention

As described, traditional mindfulness-based interventions seem to foster an internal focus of attention via engendering attention to internal stimuli (e.g., breathing, muscle tension). Traditional mindfulness-based interventions could thus be considered internally focused. An internal focus of attention parallels a concept termed self-focused attention described in the psychopathology literature. Self-focused attention has been defined “as an awareness of self-referent, internally generated information that stands in contrast to an awareness of externally generated information derived through sensory receptors” (Ingram, 1990, p. 156). An example of self-focused attention would include gathering internal information related to changes in somatic symptoms. Self-focused attention can also take the form of attending to present, past, or future actions (Ingram, 1990). Of note, in a review of the extant literature, Ingram identified a robust link between high levels of self-focused attention and anxiety disorders.

The link between self-focused attention and anxiety disorders has led to the development of intervention strategies that seek to reduce the degree to which an individual repetitively attends to internal experiences (i.e., is self-focused; Wells, 2009).

One such intervention strategy is Wells's (1990, 2007, 2009) attention training technique (ATT). ATT involves presenting individuals with auditory stimuli while they complete attentional exercises related to selective attention, attention switching, and divided attention. ATT is just one component of a broader treatment package (Wells, 2009), but ATT has been shown to reduce anxiety as a standalone intervention (Papageorgiou & Wells, 1998; Wells, 1990; Wells, White, & Carter, 1997).

Wells (2002) considers ATT to be a type of mindfulness-based intervention. Indeed, the purpose of ATT (i.e., nonjudgmentally attending to sounds) parallels Kabat-Zinn's (1994) definition of mindfulness discussed above. However, Wells highlighted a major distinction between ATT and the more traditional mindfulness-based interventions described earlier that seemingly engender an internal focus of attention. More precisely, Wells stated that "this technique [ATT] differs from the mindfulness strategies reviewed above in that it does not require self-focused attention" (p. 96). As such, ATT could be considered an external form of a mindfulness-based intervention in that ATT requires focus on external, rather than internal, experiences during its completion.

Gaps in the Literature

Mindfulness-based interventions are useful in the reduction of anxiety symptoms. Nonetheless, there appear to be at least two types of mindfulness interventions. One type presumably fosters an internal focus, or self-focused, attention and the other type presumably fosters an external focus of attention. However, no known study has yet examined whether focus of attention is in fact differentially affected by these seemingly divergent approaches to mindfulness. A second unresolved issue surrounding an internal versus external approach to mindfulness is whether these approaches differentially reduce

anxiety symptoms. Because self-focused attention is related to greater anxiety, it is possible that an externally focused mindfulness-based intervention would be more effective in reducing anxiety symptoms than would an internally focused version.

A laboratory-based component study was completed to compare the effects of an internal and external mindfulness-based task. Levin, Hildebrandt, Lillis, and Hayes's (2012) outlined criteria for a laboratory-based component study, including use of a single session of a component of an intervention, random assignment, and inclusion of at least one outcome variable of possible applied or theoretical relevance, were followed. In this study, Orsillo and Roemer's (2011) mindfulness-based progressive muscle relaxation (MB-PMR) was the targeted internal mindfulness-based task. MB-PMR was chosen because it is a published mindfulness-based task, it can be used within a single session, and it is equivalent in length to the chosen component of an external mindfulness-based task. Wells's (1990, 2007, 2009) ATT was the targeted external mindfulness-based task. It was predicted that MB-PMR and ATT would differentially change pre-to-post task focus of attention, with ATT causing a greater external focus of attention and MB-PMR causing greater self-focused attention. It was further predicted that ATT would lead to a greater reduction in pre-to-post task anxiety symptoms than would MB-PMR.

CHAPTER TWO

Method

Participants

The total sample consisted of 76 undergraduate students at Baylor University. The mean age of the sample was 18.9 years ($SD = 1.0$) and the majority were female (84.2%). Approximately 60.5% of the sample self-identified as White, 11.8% as Latino, 11.8% as Asian, 10.5% as African American, 2.6% as bi- or multi-racial, and 2.6% as “Other” race/ethnicity.

Measures

Focus of attention. Focus of attention was assessed using the standard one-item marker of this variable (Wells, 2009). This item asks participants to report “at this moment in time how much is your attention focused on yourself or on your external environment?” using a 7-point scale (ranging from -3 to 3). Lower (negative) scores indicate greater external focus of attention and higher (positive) scores indicate greater self-focused attention.

Anxiety. The state version of the State-Trait Inventory for Cognitive and Somatic Anxiety (STICSA; Ree, French, MacLeod, & Locke, 2008) was used to assess anxiety. The STICSA is a 21-item measure that consists of a 10-item scale that assesses cognitive anxiety (e.g., *I worry that I cannot control my thoughts as well as I would like to*) and an 11-item scale that assesses somatic anxiety (e.g., *I feel trembly and shaky*). Items are rated using a 4-point scale (ranging from 1 to 4). Higher scores indicate greater anxiety. The scales of the STICSA correlate (r s of .53 and .63) with another measure of state

anxiety (Grös, Antony, Simms, & McCabe, 2007). The cognitive (Cronbach's α s of .90 and .82) and somatic (α s of .74 and .70) scales of the STICSA demonstrated adequate internal consistency at both assessment points.

Procedure

Participants completed the experimental session individually within a lab room where a laptop computer had been set up on a table and the randomly assigned experimental condition presented on the computer screen. Participants sat at the table while the study was described to them. Participants were informed that their responses to study measures were confidential and they were free to withdraw from the study at any time. Upon receiving written informed consent, participants completed a demographics questionnaire, focus of attention item, and state STICSA on the computer. Participants then completed either the internal or external mindfulness task, depending on their condition assignment.

The internal mindfulness task was a single session of MB-PMR (Orsillo & Roemer, 2011). MB-MPR asks individuals to initially bring their focus to their breath and body sensations. Individuals are then asked to bring awareness to muscles and tension in their neck, moving down the body from the top to the bottom, all the while emphasizing that the focus should be on the tension and the feeling of the tension release. The goal of this task is to notice tension build up in muscles and release that tension, while focusing internally on body sensations. The external mindfulness task was a single session of ATT (Wells, 2009). During ATT, individuals are asked to differentially focus on presented sounds. Both mindfulness tasks were presented using MP3 recordings developed by the creators of the techniques through headphones while participants were

seated. Both tasks lasted approximately 10 minutes. Upon completing the mindfulness-based task, participants completed the focus of attention item and state STICSA a second time on the computer. Upon completing the experimental session, participants were then debriefed and thanked for their participation. Participants received partial course credit for their participation.

CHAPTER THREE

Results

There were no significant group differences in age ($t_{(74)} = 0.11, ns$) or gender ($\chi^2_{(1)} = 0.00, ns$). There was a significantly higher number of self-identifying racial/ethnic minorities in the ATT relative to the MB-PMR group ($\chi^2_{(1)} = 5.57, p < .05$). As such, race/ethnicity (coded as White versus racial/ethnic minority) was included as a covariate for analyses that compared the two groups. Pre- and post-task descriptive statistics are presented in Table 1. There were no significant group differences in pre-task focus of attention ($t_{(74)} = 1.53, ns$), cognitive anxiety ($t_{(74)} = 1.46, ns$), or somatic anxiety ($t_{(74)} = 0.26, ns$).

T scores were used to compare the mean score on the pre-task STICSA in this study to the mean score obtained on this measure in prior studies. *T* scores have a mean of 50 with a *SD* of 10. The mean *T* score for the pre-task STICSA scales was 52.47 (cognitive) and 51.95 (somatic), respectively, in comparison to Ree et al.'s (2008) nonclinical sample. These scores indicate that the mean score on the pre-task STICSA in this study fell within 0.5 *SD* of the mean score obtained on this measure in Ree et al.'s study. The mean *T* score for the pre-task STICSA scales was 40.05 (cognitive) and 41.95 (somatic), respectively, in comparison to Grös et al.'s (2007) clinical sample. These scores indicate that the mean score on the pre-task STICSA in this study fell approximately 1.5 *SD* below the mean score obtained on this measure in Grös et al.'s study. As such, the current sample had pre-task anxiety similar in magnitude to prior nonclinical samples, but lower pre-task anxiety than prior clinical samples.

Table 1

Pre- and Post-Task Descriptive Statistics.

Variable	Task			
	Pre-Task		Post-Task	
	<i>n</i> = 38		<i>n</i> = 38	
	<i>Mean</i>	<i>(SD)</i>	<i>Mean</i>	<i>(SD)</i>
<u>Focus of attention</u>				
ATT	0.18	(1.47)	-0.68	(1.65)
MB-PMR	-0.32	(1.38)	0.76	(1.48)
<u>STICSA-Cognitive</u>				
ATT	17.42	(7.01)	13.84	(4.06)
MB-PMR	19.66	(6.34)	14.11	(4.29)
<u>STICSA-Somatic</u>				
ATT	14.32	(4.04)	13.26	(2.69)
MB-PMR	14.53	(3.04)	12.92	(2.42)

Note. ATT = Attention training technique; MB-PMR = Mindfulness-based progressive muscle relaxation; STICSA = State-Trait Inventory for Cognitive and Somatic Anxiety.

A repeated-measures analysis of variance (ANOVA) was used to examine changes in focus of attention. Focus of attention was the within-subjects variable and condition (MB-PMR or ATT) was the between-subjects variable. ANOVA results are presented in Table 2. The significant focus of attention x condition interaction supported the prediction that pre-to-post focus of attention would differentially change between the two mindfulness tasks. The interactive effect was not attributable to the racial/ethnic group differences ($F_{(1,73)} = 15.89, p < .001$). Participants became more self-focused following MB-PMR and more externally focused following ATT. Paired samples *t*-tests were used to examine whether the changes in focus of attention in each group were

significantly different from zero. These analyses revealed that ATT caused participants to become significantly more externally focused ($t_{(37)} = 2.53, p < .05$) and MB-PMR caused participants to become significantly more self-focused ($t_{(37)} = 3.95, p < .001$).

Repeated-measures ANOVAs were used to examine changes in anxiety. Anxiety (cognitive or somatic) was the within-subjects variable and condition (MB-PMR or ATT) was the between-subjects variable. ANOVA results are presented in Table 2. The non-significant cognitive anxiety x condition interaction and the non-significant somatic anxiety x condition interaction did not support the prediction that the rate of pre-to-post changes in anxiety would differ between MB-PMR and ATT. The significant within-subjects main effects in both ANOVAs indicated an overall pre-to-post reduction in anxiety. Follow-up paired samples *t*-tests revealed that MB-PMR ($t_{(37)} = 9.00, p < .001$) and ATT ($t_{(37)} = 4.18, p < .001$) both caused participants to experience significantly less cognitive anxiety. Follow-up paired samples *t*-tests further revealed that MB-PMR ($t_{(37)}=2.87, p < .01$), but not ATT ($t_{(37)} = 1.57, ns$), caused participants to experience significantly less somatic anxiety.

Table 2

Summary of Repeated-Measures Analysis of Variance (ANOVA) Results.

<u>Effect</u>	<u>F-statistic</u>
<u>Within-Subjects</u>	
Focus of Attention	$F_{(1,74)} = 0.23$
Focus of Attention x Condition	$F_{(1,74)} = 19.67^{**}$
<u>Between-Subjects</u>	
Condition	$F_{(1,74)} = 3.19$
<u>Within-Subjects</u>	
STICSA-Cognitive	$F_{(1,74)} = 74.84^{**}$
STICSA-Cognitive x Condition	$F_{(1,74)} = 3.50$
<u>Between-Subjects</u>	
Condition	$F_{(1,74)} = 1.15$
<u>Within-Subjects</u>	
STICSA-Somatic	$F_{(1,74)} = 9.27^{**}$
STICSA-Somatic x Condition	$F_{(1,74)} = 0.40$
<u>Between-Subjects</u>	
Condition	$F_{(1,74)} = 0.01$

Note. $^{**} p < .01$ (two-tailed). STICSA = State-Trait Inventory for Cognitive and Somatic Anxiety.

CHAPTER FOUR

Discussion

The goal of this study was to examine the effects of internal and external mindfulness-based tasks on focus of attention and anxiety. As predicted, a mindfulness-based task that appears best conceptualized as an internally focused task (i.e., MB-PMR) caused participants to experience greater self-focused attention. Alternatively, and as predicted, a mindfulness-based task that appears best conceptualized as an externally focused task (i.e., ATT) caused participants to experience greater external focus of attention. Nonetheless, the present findings indicated that, overall, both mindfulness-based tasks worked equally in reducing anxiety symptoms.

Baer et al. (2008) provide one potential explanation for the unexpected comparable levels of reductions in anxiety symptoms following MB-PMR and ATT. More precisely, and similar to conclusions reached by Wells (2002), Baer et al. stated that traditional mindfulness-based strategies do in fact lead individuals to closely observe internal experiences. However, Baer et al. further stated that these strategies teach individuals to observe internal experiences using an accepting and nonreactive stance. These researchers concluded that “close observation of internal experience may be maladaptive in the general population but adaptive when it is done mindfully” (Baer et al., 2008, p. 331). By focusing internally on the tensing and relaxation of muscles, participants completing internal mindfulness-based task in this study might have been able to let go of their tension and anxiety via feeling these experiences exiting their body, despite being self-focused.

Nonetheless, the present results indicate that external mindfulness-based strategies are preferable to use relative to competing internal mindfulness-based strategies when a treatment goal is to evoke an external focus of attention. For example, patients are asked to manipulate their focus of attention to examine its impact on their anxiety during behavioral experiments as part of cognitive-behavioral treatments for social anxiety (Clark, 2001). Based on the present results, ATT is one standardized therapeutic technique that could help promote an external focus of attention.

The present results indicate that a single-session of mindfulness can have beneficial effects on anxiety. However, one limitation of this study was that a follow-up assessment was not completed. As such, it is unclear if the observed experimental effects on focus of attention or anxiety symptoms were maintained. Another limitation of this study was that participants reported experiencing only a modest amount of anxiety. A manipulation to increase pre-task anxiety was not included because of the interest in examining how participants naturally reacted to the respective mindfulness-based task. However, future research might seek to examine whether similar effects are found when participants are experiencing consistently higher levels of anxiety symptoms. Pursuant to this issue, the generality of the present findings would be assured via replication among participants with diagnosed anxiety disorders. A control group was included in this study because the goal was to compare two specific types of mindfulness-based tasks. As such, these data cannot speak to the relative effectiveness of mindfulness-based interventions compared to other treatment modalities.

There is growing interest in using mindfulness-based interventions in the treatment of anxiety disorders. The present results shed light onto potentially important

differences across such interventions. More precisely, mindfulness-based interventions can likely be classified based on whether they promote self-focused attention or an external focus of attention. Findings indicating that internal and external mindfulness-based interventions differentially alter focus of attention suggest that these interventions likely reduce anxiety symptoms through different mechanisms of change. Identifying the mechanisms of change underlying different mindfulness-based interventions in future studies might ultimately allow for a better understanding as to which mindfulness-based interventions are most effective for specific types of anxiety symptoms.

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