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RUMINATION AS A MEDIATOR OF THE RELATION BETWEEN MINDFULNESS AND SOCIAL ANXIETY IN A CLINICAL SAMPLE

by

STEFAN SCHMERTZ

Under the Direction of Page Anderson

ABSTRACT

Recent literature has emphasized the possible benefits to mindfulness practice. Evidence for a negative relation between mindfulness and pathology has come from validity studies of several newly developed, self-report mindfulness questionnaires. Results illustrate a consistent negative relation between levels of self-report mindfulness and symptoms of depression, negative affect, and anxiety among college-student samples, however this relation has been previously untested within a clinical sample. The first aim of the present study was to explore the relation between mindfulness levels and social anxiety symptoms in a clinical sample diagnosed with social phobia. Because past research has found mindfulness interventions to be successful in reducing ruminative tendencies, and because recent literature suggests that post-event rumination is an important process in the maintenance of social anxiety, post-event rumination was explored as a mediator of the relation between mindfulness and social anxiety. Participants

(N = 98) completed the Mindful Attention Awareness Scale (MAAS), the Rumination Questionnaire (RQ), the Fear of Negative Evaluations Brief Form (FNE-B), the Liebowitz Social Anxiety Scale (LSAS), and the Personal Report of Communication Apprehension (PRCA) as part of their participation in a larger, randomly controlled treatment outcome study comparing Virtual Reality Exposure Therapy, a form of Cognitive-Behavioral Group Therapy for Social Phobia, and a wait-list control group. Results illustrated a strong negative relation between mindfulness scores (MAAS) and social anxiety symptoms as measured by the FNE-B and the LSAS ($ps < .001$). However, post-event rumination levels (RQ) were not related to either mindfulness or social anxiety indicating that in the present sample post-event rumination did not act as a mediator for the relation between mindfulness and levels of social anxiety.

INDEX WORDS: Mindfulness, Social anxiety, Rumination, Mediation, Mechanisms of change

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by

STEFAN SCHMERTZ

A Dissertation Submitted in Partial Fulfillment of the Requirements for the Degree of

Doctor of Philosophy

in the College of Arts and Sciences

Georgia State University

2010

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by

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CHAPTER 1.

INTRODUCTION

Mindfulness has been defined as, “the awareness that emerges through paying attention on purpose, in the present moment, and non-judgmentally to the unfolding of experience, moment to moment” (Kabat-Zinn, 2003; p. 144), and as “the process of intentionally attending moment by moment with openness and nonjudgmentalness” (Shapiro, Carlson, Astin, & Freedman, 2006; p. 378). Although mindfulness has its roots in contemplative traditions that actively seek heightened awareness through meditation (e.g. Buddhism), the techniques increasingly have been incorporated into Western mental health treatment programs, as enhanced attention to and awareness of present experience is thought to foster self-regulatory processes that are important to mental health. Mindfulness training is now an integral part of newer cognitive and behavioral therapies such as Mindfulness Based Stress Reduction (MBSR; Kabat-Zinn, 1982), Mindfulness Based Cognitive Therapy (MBCT; Segal, Williams, & Teasdale, 2002), Dialectical Behavior Therapy (DBT; Linehan, 1993), and Acceptance and Commitment Therapy (ACT; Hayes, Strosahl, & Wilson, 1999). Meta-analysis reveals that mindfulness interventions have demonstrated promise in the treatment of chronic pain, stress, anxiety, depressive relapse, and disordered eating (Baer, 2003).

Recent literature not only has emphasized the possible benefits to mindfulness practice, but also has begun to outline a relation between a lack of experiential awareness and pathology. Open awareness of the present moment is thought to be in contrast to automatic or habitual thought processes that are more prone to rumination, preoccupation with the past, and anxiety about the future (Brown & Ryan, 2003). Herein lays the primary theorized connection between lower levels of mindfulness and psychopathology. People who tend to be less mindful may have

more difficulty disengaging from automatic negative thoughts, habits, and unhealthy behavior. For example, someone acting without awareness may have more difficulty noticing ruminative thoughts that are raising their anxiety or lowering their mood. Furthermore, awareness of experience is thought to facilitate choices and behaviors that are congruent with one's needs and values (Hayes & Wilson, 2003; Ryan & Deci, 2000). Someone who is more mindful may be more attuned to their own, as well as their partner's needs in a relationship, thus aiding communication and avoiding conflict. This type of self regulation and decision making may act as a buffer for the development of psychopathology. Evidence for a negative relation between mindfulness and pathology has come from validity studies of several newly developed, self-report mindfulness questionnaires. Results illustrate a consistent negative relation between levels of self-report mindfulness and symptoms of depression, negative affect, and anxiety among college-student samples (Baer, Smith, & Allen, 2004; Lau et al., 2006; Brown & Ryan, 2003; Feldman, Hayes, Kumar, Greeson, & Laurenceau, 2007). However, no published study to date has examined the relation between mindfulness and symptom severity within a clinical sample.

To contribute to the empirical literature regarding the relation between mindfulness and levels of psychopathology, this study examined the relation between self-report mindfulness and levels of social anxiety in a clinical sample with a primary diagnosis of social phobia. An additional aim of the present study was to explore whether post-event rumination, a core component in the maintenance of social anxiety (Clark & Wells, 1995), acts as a mediator in the proposed relation between mindfulness and levels of social anxiety. Data for this study were drawn from a larger randomized controlled trial comparing two treatments for social phobia. To build a rationale for the present study, a review of the following topics is presented: (1) the relation between self-report mindfulness and psychopathology, (2) theorized ways in which

mindfulness may promote well-being, (3) the effects of mindfulness on ruminative processes, (4) social phobia, and the role of rumination in the maintenance of this disorder.

Comparisons of Self-report Mindfulness with Measures of Psychopathology

Initial examinations of associations between mindfulness and levels of psychopathology primarily have been conducted with college undergraduate populations using self-report measures. Brown and Ryan (2003) constructed the Mindful Attention Awareness Scale (MAAS; Brown & Ryan, 2003), which assesses the degree to which one functions without awareness of present experience throughout daily life. The authors found that the MAAS was negatively related to levels of depression as measured by both the Center for Epidemiological Studies-Depression Scale, and the Beck Depression Inventory (BDI), in an undergraduate sample. The same study reported similar relationships between mindfulness and both state and trait anxiety (State-Trait Anxiety Inventory; Spielberger, 1983), as well as the anxiety subscale from the Profile of Mood States questionnaire (McNair, Lorr, & Droppleman, 1971). Although an exclusive measure of social anxiety was not included in this study, the MAAS was negatively related to the Social Anxiety subscale from the Self-Consciousness Scale (Fenigstein, Scheier, & Buss, 1975). A more recent study by Coffey and Hartman (2008) found that MAAS levels were negatively related to the depression and anxiety subscales of the Brief Symptom Inventory (BSI; Derogatis, 1983) in two separate samples of undergraduates.

Validity assessment of other self-report mindfulness instruments also has shown a relation between mindfulness and psychopathology in undergraduate samples. Baer and colleagues (2004) developed the Kentucky Inventory of Mindfulness Skills (KIMS) based on the four components addressed in Linehan's model of mindfulness associated with Dialectical Behavior Therapy (DBT). The four factors are (1) *observe*; the tendency to observe or notice

more subtle stimuli in one's environment, (2) *describe*; the ability to describe thoughts and feelings as they arise, (3) *act with awareness*; the tendency to focus undivided attention to current activity, and (4) *accept without judgment*; the tendency to allow experiences to occur without judging them as negative or positive. They found that the Global Severity Index from the Brief Symptom Inventory (BSI; Derogatis, 1992) was negatively associated with the *describe*, *act with awareness*, and *accept without judgment* subscales from the KIMS. A significant relation did not exist between the *observe* subscale and the BSI (Baer et al., 2004).

The Cognitive Affective Mindfulness Scale – Revised (CAMS-R; Feldman et al., 2007) is a single factor instrument that derives its higher-order construct of mindfulness from four components: a) the regulation of attention, b) orientation to present experience, c) awareness of experience, and d) acceptance/non-judgment towards experience. Feldman and colleagues found that the CAMS-R was negatively associated with all four subscales of the Mood and Anxiety Symptom Questionnaire (Watson et al., 1995), which includes General Distress (anxiety), Anxious Arousal, General Distress (depression), and Anhedonic Depression (Feldman et al., 2007). This same study found that the CAMS-R was negatively associated with the Penn State Worry Questionnaire (Meyer, Miller, Metzger, & Borkovec, 1990). In summary, comparisons of self-report mindfulness with different aspects of anxiety and depression have consistently demonstrated that higher mindfulness scores are associated with lower levels of psychopathology among college undergraduate samples.

Additional support for a relation between mindfulness and psychopathology has come from studies that have found that clinical samples score lower on self-report mindfulness than non-clinical controls. Baer and colleagues (2004) compared levels of self-report mindfulness (KIMS) between a student sample and a sample diagnosed with Borderline Personality Disorder

(BPD). Results indicated that the BPD sample scored significantly lower than students on three of the four KIMS subscales (*describe, act with awareness, & accept without judgment*). In addition, Feldman and colleagues (2007) found that a psychiatric sample composed of clients with at least one Axis I diagnosis, scored significantly lower on mindfulness (CAMS-R) than a student control sample.

In summary, there is consistent evidence that levels of self-report mindfulness are negatively related to measures of psychopathology in non-clinical samples. In addition, a handful of studies have shown that clinical samples score significantly lower on self-report mindfulness than controls. Thus, there is accumulating evidence for a relation between self-report mindfulness and levels of psychopathology, although this relation has not been tested within a clinical sample. The next section reviews the mechanisms by which mindfulness is theorized to be related to psychopathology, and how increasing mindfulness skills may lead to improved well being.

Mindfulness and Well Being

Recent reviews (Shapiro, et al., 2006; Baer, 2003) have outlined several potential mechanisms to explain how mindfulness skills may be beneficial. These include: gaining a decentered view of one's internal experience, reducing harmful avoidance via exposure, more accurate interpretation of environmental contingencies, improved affect regulation, and reductions in ruminative processes. First, mindfulness interventions are thought to provide a different perspective on thoughts and emotions, in which thoughts and emotions are viewed from an observer perspective, as transient entities that are separate from the person having them. This is sometimes worded as a "decentered" view, or "metacognitive awareness" (Bishop et al., 2004; Shapiro, et al., 2006). Thoughts such as "I will look foolish", might be viewed as, "I am having

the thought that I will look foolish,” and thus become less threatening and distressful. This perspective is also thought to increase one’s ability to evaluate and reality test thoughts and attributions (Kohlenberg, Hayes, & Tsai, 1993).

Mindfulness also may provide the opportunity for prolonged exposure to previously avoided sensations of pain or anxiety. Exposure is a primary behavioral intervention aimed at extinguishing fearful responses to situations or psychological content perceived as threatening. The present centered, non-judgmental awareness that is cultivated through mindfulness may allow for increased contact with negative emotional content. This may be important in promoting healthy processing of difficult thoughts or emotions, whereas avoidance of threatening stimuli perpetuates fear by eliminating the opportunity for habituation to the feared stimulus (Hayes, Wilson, & Gifford, 1996). For example, someone with social phobia who fears open criticism when speaking in public and therefore avoids these situations may not get sufficient opportunity to learn that this is a rare occurrence. Such avoidance also is self-perpetuating via negative reinforcement. In contrast, nonjudgmental observation of these experiences, as is promoted through mindfulness, may lead to the extinction of fear and avoidance responses normally elicited by certain situations or sensations (Baer, 2003). Similarly, the attitude of acceptance that is taught in mindfulness may be important in encouraging participants to experience thoughts and emotions more fully and without defense. If thoughts and emotions are not viewed as “bad” or “stupid,” they may become less threatening, reducing the likelihood of harmful avoidance behaviors. Hayes (1999) describes acceptance as a way of teaching people the willingness to “carry” difficult emotions, which are an inevitable part of human experience, while working toward a fulfilling life. In one of the only studies to explore how mindfulness may be beneficial, Arch and Craske (2006) found that undergraduates who participated in a 15 minute focused

breathing exercise were more willing to view slides of highly negative material than an unfocused attention control group. Thus, mindfulness facilitates exposure through increased contact with current experience and the cultivation of a willingness to experience negative emotional content.

“Beginners mind,” or “new-mindedness” are terms that are often used to describe the quality, or type of attention that one brings to the present moment in mindfulness practice (Kabat-Zinn, 1990). Non-judgmental attention is thought to give rise to an awareness of the here and now that is imbued with curiosity. From this stance, experiences throughout daily living may be experienced almost as if for the first time. That is, our ongoing experience may be freed from biases and judgments that would have otherwise informed or colored our experience. This may be important with regard to biases that are commonly associated with psychopathology, such as biases for threat (e.g. anxiety) or for negative self-content (e.g. depression). Non-judgmental awareness may allow one to contact present experience without such biases, and thus respond more accurately to the contingencies of any given situation. For example, someone with social phobia may more accurately interpret neutral facial expressions, as opposed to viewing them through a lens of threat related biases (Bogels & Mansell, 2004).

Mindfulness may also provide the opportunity for improved affect regulation and self-management by interrupting the automatic way in which our thought processes work throughout daily life (Kabat-Zinn, 1990). “The idea is that automatic and typical reactions now become a choice as opposed to an inevitability.” (Wenk-Sormaz, 2005; p. 43) For example, someone who is stuck in traffic, instead of immediately becoming frustrated with, and disdainful of their situation, may now realize that they have some unexpected time to spend with their child who is riding with them (Wenk-Sormaz, 2005). In their study, Arch and Craske (2006) found that

participants from the focused breathing group also reported lower negative affect and overall emotional volatility in response to viewing negative images than did controls suggesting that the brief mindfulness induction improved emotion regulation.

Finally, mindfulness may reduce rumination tendencies, a highly researched cognitive process associated with increased psychopathology and negative affect (Nolen-Hoeksema, 1991; Lyubomirsky & Tkach, 2004). Rumination has been defined as “self-focused, persistent, recurrent, negative thinking” (Roelofs, Papageorgiou, Gerber, Huibers, Peeters, & Arntz, 2007; p. 1295), and has been linked to increases in psychological symptoms associated with depression (Spasojevic & Alloy, 2001), disordered eating (Eckern, Stevens, & Mitchell, 1999), substance abuse (Nolen-Hoeksema, Stice, Wade, & Bohon, 2007), obsessive compulsive disorder (Stein & Hollander, 1997) and social anxiety (Hoffman & Scepkowski, 2006).

Researchers theorize that mindfulness skills may interfere with rumination in several ways. First, intentionally cultivating nonjudgmental awareness of the present moment is, by definition, contrary to the automatic and habitual processes of rumination. This is because awareness of present experience engages attentional resources that would otherwise be used to ruminate (Brown & Ryan, 2003). Secondly, mindfulness increases one’s ability to view negative thoughts from an observer perspective, creating a “distance” that allows one to both notice the accuracy of these thoughts and disengage from ruminative cycles (Teasdale et al., 2000). The next section outlines preliminary studies examining the effects of mindfulness interventions on ruminative processes.

Mindfulness and Rumination

A handful of studies suggest that mindfulness interventions may reduce levels of rumination in both non-clinical and clinical samples. Shapiro and colleagues (2007) found that

students who took part in a 10-week MBSR intervention, showed greater reductions in rumination compared to a cohort matched group of controls. In addition, increases in self-report mindfulness predicted reductions in levels of rumination among the treated sample. Coffey and Hartman (2008) recently examined the relation between mindfulness, rumination, and psychological symptoms by collecting cross sectional, self-report data in two samples of undergraduates ($N = 204$ & 258). As predicted, they found higher mindfulness scores (MAAS) were associated with lower levels of psychological distress as measured by the depression and anxiety subscales from the BSI (Derogatis, 1983). Further, rumination as measured by the *rumination* subscale from the Rumination-Reflection Questionnaire (RRQ; Trapnell & Campbell, 1999) significantly mediated the negative relation between mindfulness and depressive and anxious symptomatology. The RRQ describes rumination as one's tendency to dwell on, rehash, or reevaluate events and experiences (Trapnell & Campbell, 1999). Although data were cross sectional, results from this study suggest that levels of rumination may explain a significant portion of the relation between mindfulness and psychological distress.

Ramel and colleagues (2004) found that an 8-week MBSR intervention, conducted with patients with a history of major depression, was associated with significant reductions in ruminative tendencies. This finding remained even when controlling for changes in depressive (BDI) and anxious affect (STAI-trait), yet reductions in mood symptoms did not remain significant when controlling for changes in rumination. This suggests that changes in rumination explained a significant portion of the reductions in mood and anxiety symptoms measured in this study. Furthermore, the amount of mindful meditation that participants reported practicing as homework during the 8-week intervention significantly predicted reductions in rumination.

In a randomized controlled trial conducted with students reporting depressed mood, Jain and colleagues (2007) found that both mindfulness meditation and relaxation training led to significant decreases in negative affect (Global Severity Index from the BSI) and increased positive mood states when compared to wait-list controls. However, only the mindfulness group demonstrated significant decreases in rumination. Furthermore, distress reduction was partially mediated by reductions in rumination for those participating in the mindfulness intervention.

In summary, mindfulness is theorized to interrupt ruminative tendencies and cultivate an observer perspective of one's thoughts and emotions, which facilitates disengagement from automatic and habitual thought patterns. Studies suggest that increased mindfulness is related to lower levels of rumination, and that mindfulness training is associated with reductions in rumination. Two studies suggest that ruminative processes may mediate the relation between mindfulness and negative affect. As described above, rumination is thought to play a role in the etiology and maintenance of a number of forms of psychopathology. As the current study focuses on the relation between mindfulness and rumination in a clinical sample with social anxiety, the next sections provide an overview of social phobia and a review of theorized models linking rumination and social anxiety.

Social Phobia and the Role of Rumination

According to the DSM-IV (APA, 1994; p. 450), social phobia is characterized by a “marked and persistent fear of social or performance situations” that is driven by a fear of negative evaluation. Exposure to these situations almost invariably produces a level of anxiety that is recognized as excessive or unreasonable. Thus, social or performance situations are either avoided or endured with great distress (See Appendix A for DSM-IV diagnostic criteria). The most commonly feared situation among those with social phobia is public speaking. Speaking to

strangers or meeting new people are also common fears. Less common fears include eating, drinking, or writing in public. Those who fear most social situations may be given a “generalized” specifier according to the DSM-IV (APA, 1994). The lifetime prevalence of social phobia has been estimated to be between 3% and 13% (DSM-IV, APA, 1994), and Rapee and colleagues (1988) point out that social anxiety is a common comorbid diagnosis with other anxiety disorders. Social phobia is associated with lower levels of education achievement and less income; those with this disorder are also less likely to be married (Turner & Beidel, 1989). Social phobia is commonly comorbid with substance abuse and major depression (Turner & Beidel, 1989). Furthermore, prospective studies suggest that social anxiety symptoms often predate the onset of substance abuse and depression, making social anxiety a risk factor for the development of these disorders (Bruce, 2001; Katzelnick & Greist, 2001). Additionally, the literature suggests that social phobia has a low rate of treatment compared to other major disorders. Studies have indicated that between 72% and 95% of individuals who receive a diagnosis report never having received mental health treatment (Robins & Reiger, 1992; Schneier, Johnson, Hornig, Liebowitz, & Weissman, 1992). Although epidemiological research suggests that social phobia is more common in females than males (Lovibond & Rapee, 1993), many clinical studies report populations with an equal distribution among genders (e.g. Heimberg et al., 1990). Studies generally report an onset for social phobia ranging from late childhood to early adolescence (Turner & Beidel, 1989).

Social phobia is associated with a number of common somatic symptoms of anxiety that include, sweating, palpitations, tension, nausea, and blurred vision (Barlow, 1986). Negative thought content associated with this disorder is thought to fall into four general categories: a) general physiological discomfort and social inadequacy, b) concern with other’s awareness of

distress, c) fear of negative evaluations, and d) perceptions of autonomic arousal (Hartman, 1984). The most common behavioral component of social phobia is avoidance of feared social situations that leads to marked impairment in daily functioning.

Psychological models for the etiology and maintenance of social phobia emphasize that individuals with this disorder tend to have high social standards yet tend to be poor at setting appropriate and attainable goals for themselves in social situations (Clark & Wells, 1995; Leary, 2001). In addition, individuals with social phobia demonstrate heightened self-focused attention under social threat which leads to an overestimation of physiological arousal (e.g. feeling as if others can tell that your heart is racing) and the perception of low emotional control (Clark & Wells, 1995; Hofmann, & Scepkowski, 2006; Rapee & Heimberg, 1997). People with social phobia also tend to hold negative perceptions of themselves as social objects and tend to overestimate the probability and subsequent cost of social mishaps, fearing loss of status, loss of worth, and rejection (Hofmann, & Scepkowski, 2006; Rapee & Heimberg, 1997). These factors often lead to the implementation of avoidance and safety behavior strategies. Safety behaviors are considered anything that one does to reduce anxiety while in feared social situation. These may be overt, such as use of alcohol to overcome one's apprehension, or more subtle, such as speaking quickly to reduce the chance that others will notice a "shaky" voice. In any case, safety behaviors prevent an individual from facing their fear, and reduce the likelihood of desensitization in these situations (Hofmann, & Scepkowski, 2006). Lastly, according to research conducted by Clark and colleagues (Clark, 2001; Clark & Wells, 1995), individuals with social phobia engage in post-event rumination processes (post event processing) that typically focus on negative self perceptions and anxious feelings experienced during a previous social situation. Repetitive negative thinking about past experiences may also contribute to ruminative

anticipatory processing of expected social interactions in the context of past failures (Hofmann & Scepkowski, 2006).

There is a growing body of research to support the role of post-event rumination in the maintenance of social phobia. Several studies have found that levels of post-event rumination are strongly related to levels of social anxiety in undergraduate samples (Dannahy & Stopa, 2007; Fehm, Schneider, & Hoyer, 2006; Kashdan & Roberts, 2006; Lundh & Sperling, 2002; Mellings & Alden, 2000). Perini and colleagues (2006) found that participants with social phobia reported more post event rumination than non anxious controls following the performance of an impromptu speech. Further, levels of social anxiety and post event rumination were positively related in this clinical sample. Abbott and Rapee (2004) also documented significantly higher levels of post-event rumination among participants with a diagnosis of social phobia than among non-clinical controls. In addition, hierarchical regression analyses indicated that depression did not account for any variance in negative post-event rumination beyond that already accounted for by social anxiety. This is important because it suggests that among socially anxious individuals, there is a unique relation between post-event rumination and symptoms of social apprehension that is not better accounted for by depressive symptoms.

In addition, there is some evidence that post-event rumination is related to other psychological components of social phobia. Mellings and Alden (2000) found that negative post-event processing predicted the level of negative self-related information that participants recalled following a social event. This illustrates how the negative focus of post-event rumination may provide additional evidence to the socially anxious person that they are incompetent in this arena, and thus contribute to the overall negative self-assumptions that they make about themselves. Rachman and colleagues (2000) found that participants endorsing higher levels of

post-event rumination were more likely to report subsequent avoidance of similar social situations.

In summary, studies have shown that post-event rumination is strongly associated with levels of social apprehension. Furthermore, research suggests that post-event rumination may contribute to negative self-perception, and is associated with greater avoidance of future social encounters. Thus, post-event rumination is thought to play an important role in the maintenance of social anxiety. Because previous research suggests that increased mindfulness is associated with reductions in ruminative processes, it may follow that rumination acts as a mediator for the relation between mindfulness and social anxiety symptoms.

Study Objectives

The primary objective of the present study was to explore the relation between levels of self-report mindfulness and levels of social apprehension in a socially phobic sample. Because recent literature has demonstrated a relation between self-report mindfulness and levels of general psychopathology (Brown & Ryan, 2003; Baer et al., 2004; Feldman, et al., 2007; Coffey & Hartman, 2008), the primary hypothesis is that mindfulness will be related to levels of social anxiety; specifically, those scoring lower on mindfulness (MAAS) will report higher levels of social anxiety and public speaking fears. This is the first known study to examine this hypothesis in a clinical sample diagnosed with social phobia.

In an attempt to further explicate the proposed relation between self-report mindfulness and levels of social anxiety, post-event rumination was explored as a mediator of the relation between mindfulness and social anxiety. Past research has found mindfulness interventions to be successful in reducing ruminative tendencies (Ramel, Goldin, Carmona, & McQuaid, 2004), and recent literature suggests that post-event rumination is an important process in the maintenance

of social anxiety (Mellings & Alden, 2000; Rachman, Gruter-Andrew, & Shafran, 2000).

Therefore, ruminative processes may be the conduit by which mindfulness is related to social anxiety. Thus, a second hypothesis is that rumination (Rumination Questionnaire – RQ; Mellings & Alden, 2000) will mediate the relation between self-report mindfulness (MAAS) and levels of social anxiety.

CHAPTER 2.

METHOD

Participants

Participants (N = 98) completed the procedures of the proposed study as part of their participation in a larger, randomly controlled treatment outcome study comparing Virtual Reality Exposure Therapy (VRE; Anderson, Zimand, Hodges, & Rothbaum, 2005), a form of Cognitive-Behavioral Group Therapy for Social Phobia (CBGT; Hofmann, 2003), and a wait-list control group. Participants self-referred for the study in response to advertising and publicity efforts, or were referred by area professionals. Inclusion criteria included literacy in English, as well as a primary diagnosis of social phobia as determined by the Structured Clinical Interview for the Diagnostic and Statistical Manual of Mental Disorders, Forth Edition (SCID-IV; First, Gibbon, Spitzer, & Williams, 2002). In addition, participants were required to endorse public speaking as their primary fear because this was the focus of the exposure work in both VRE and CBGT. Exclusion criteria included a history of mania, schizophrenia, or other psychoses, as well as prominent suicidal ideation, or current alcohol or drug abuse or dependence. Two hundred and thirty three individuals completed an initial phone screen for the parent study; 53 did not meet inclusion/exclusion criteria, 29 could not accommodate the schedule for group therapy, and 11 withdrew after learning details of the study. One hundred and forty individuals were scheduled for an in person assessment interview, 32 did not attend the pre-treatment assessment meeting. Of the remaining 108 potential participants, 10 did not meet inclusion/exclusion criteria upon further assessment.

The sample (N = 98) for the present study was predominantly female (60%), with a mean age of 39.09 (SD = 11.27; range = 19 - 69). Most participants self-identified as either Caucasian

(47%) or African American (36%). Four self-identified as Hispanic, 2 as Asian American, 2 as Asian, 1 as African, 1 as Ethiopian, and 2 as biracial. Sixty-six percent of the sample reported completing college. Forty-three percent reported annual incomes greater than \$50,000, 49% indicated incomes between \$20,000 – \$50,000, and 8% reported annual incomes of less than \$10,000. Fifty-five percent of the sample met criteria for non-generalized social phobia public speaking sub-type, whereas the remainder (45%) received a primary diagnosis of generalized social phobia. Twenty-five percent of the sample met criteria for an additional comorbid DSM-IV diagnosis. Twelve participants met criteria for a specific phobia, 7 for generalized anxiety disorder, 5 for current major depression, 4 for dysthymia, 3 for obsessive compulsive disorder, 2 for panic disorder without agoraphobia, and 1 for post traumatic stress disorder. The mean number of DSM-IV diagnoses was 1.38 ($SD = .77$; range = 1 - 5). This study utilized data from a pre-treatment assessment, and measures pertaining to the current study are described below.

Materials

Demographic Questionnaire (See Appendix B). A brief demographic questionnaire was included to assess contextual factors.

Standard Interview for the DSM-IV (SCID: First, Gibbon, Spitzer, & Williams, 2002). The SCID is a diagnostic interview that is used to assess psychological disorders based upon the criteria of the DSM-IV. For the current project, the SCID was used as an assessment tool to determine whether participants met inclusion/exclusion criteria.

Fear of Negative Evaluation – Brief form (FNE-B; Watson & Friend, 1969) (See Appendix C). The FNE-B is a 12-item questionnaire that measures expectations regarding negative evaluation across a variety of social situations, including public speaking. Items are scored on a 5-point Likert scale (1 = not at all, to 5 = extremely). Typical items include, “I am

afraid that others will not approve of me,” and I often worry that I will say or do the wrong things.” The FNE-B is widely used, and the authors report excellent internal reliability (Cronbach’s $\alpha = .94 - .98$) and 1-month test-retest reliability ranges from $.78 - .94$. The range of scores on this instrument is 0-60, with higher scores representing greater anxiety. Weeks and colleagues (2005) report a normative mean of 46.91 ($SD = 9.27$) amongst 165 patients receiving a principle diagnosis of social phobia.

Liebowitz Social Anxiety Scale-SR (LSAS; Liebowitz, 1987) (See Appendix D). The LSAS is a two-factor, 24-item self-report instrument that measures *fear* (LSAS fear subscale) and *avoidance* (LSAS avoidance subscale) experienced in a variety of social and performance situations. Participants rate expected levels of fear and avoidance for each situation (e.g. “going to a party,” or “speaking up at a meeting”). Items are rated on a 4-point Likert scale (0 = no fear/avoidance, to 3 = severe fear/avoidance). Internal reliability estimates range from $.88$ to $.95$ (Oakman, Amerigen, Mancini, & Favolden, 2003). Scores for each factor range from 0 to 72. Normative data for a sample of 382 patients diagnosed with social phobia reported a mean fear score of 35.5 ($SD = 13.6$), and a mean avoidance score of 31.6 ($SD = 14.5$)(Heimberg et al., 1999).

Personal Report of Communication Apprehension (PRCA – short form; McCroskey, 1978) (See Appendix E). The PRCA is a 10-item measure designed to assess public speaking fears. Items are scored on a 5-point Likert scale (1 = Strongly Agree, to 5 = Strongly Disagree). Typical items include, “I look forward to an opportunity to speak in public,” and “I like to get involved in group discussions.” Internal reliability estimates range between $.87$ and $.90$ and test-retest reliability was estimated at $.74$ over a five-week period. Scores range from 10-50, with

higher scores reflecting higher anxiety. Clinical sample means are not available for this measure as it is more commonly used in the communication field.

Mindful Attention Awareness Scale (MAAS; Brown & Ryan, 2003) (See Appendix F).

The MAAS is a 15-item, single factor self-report measure assessing individual differences in the frequency of mindful states over time. Participants rate the degree to which they function without awareness in daily life. Typical items that are rated on a six-point Likert scale (almost always – almost never) include, “I forget a person’s name almost as soon as I’ve been told it for the first time,” and “I could be experiencing some emotion, and not be conscious of it until some time later.” Authors report internal consistency alphas ranging from .82 to .87. Test-retest reliability analysis with a sample of undergraduates revealed average item scores of 3.78 at time one, and 3.77 at time two (after four weeks), that were not significantly different, $t(59) = .11$. Scores for this instrument range from 15 to 90, with higher scores representing greater mindfulness.

Rumination Questionnaire (RQ; Mellings & Alden, 2000) (See Appendix G). The RQ is a 5-item instrument that assesses how much one has thought about a recent talk or speech since the actual event, and to what degree those thoughts were negatively valenced. Sample items that are rated on a 7-point Likert scale (“not at all” to “very much”) include, “In regards to your last talk or speech, to what extent did you think about the speech since giving it?” and “to what extent did you criticize yourself about not giving the talk well?” Authors report adequate internal consistency (Cronbach’s $\alpha = .70$). Scores range from 5 to 35 with higher scores reflecting greater levels of post event rumination.

Procedure

After potential participants contacted the study, doctoral students in clinical psychology at Georgia State University (GSU) conducted phone screening to determine initial

appropriateness of the project for each participant, and to begin the informed consent process. If the participant appeared to meet initial inclusion/exclusion criteria for the study, an in-person assessment was scheduled at the Georgia State Psychology Clinic. The pre-treatment assessment consisted of continuation of the informed consent process, obtaining written consent, a diagnostic interview (SCID-IV), a self-report battery including the previously described demographic, mindfulness, post-event rumination, and social anxiety measures, as well as a behavioral avoidance task (BAT; i.e. impromptu speech). For the behavioral avoidance task, participants were asked to pick several current event topics from a list, and were given three minutes to prepare notes for their speech. Participants performed their talk in front of the assessor and a video camera. They were asked to talk for 10 minutes, but were informed they could stop at any time. A Subjective Units of Distress Scale (SUDS) was used to measure their anxiety during several points during the task. This study visit took approximately two hours for each participant. The GSU Institutional Review Board (IRB) monitored this research.

Data Analysis

The Statistical Package for the Social Sciences, Version 14.0 (SPSS) was used to store and analyze data. Linear regression analyses were used to examine the relation between self-report mindfulness scores and levels of social anxiety and public speaking fears, specifically to test the hypothesis that lower self-report mindfulness scores (MAAS) would be negatively related to levels of social anxiety (FNE-B; LSAS fear; LSAS avoidance; PRCA). Individual scores were calculated for both the fear and avoidance subscales of the LSAS measure to provide a more detailed examination of the relation between mindfulness and social anxiety symptoms. The relation between mindfulness and social anxiety was further examined by assessing if post-event ruminative tendencies mediated the proposed relation between self-report mindfulness

scores and levels of social anxiety. The hierarchical regression technique specified by Baron and Kenny (1986) was used to test for mediation.

Prior to any analyses, data were inspected for normalcy, excessive missing cases, and outliers, defined as scores greater or less than three standard deviations from the mean (Field, 2005). Two outliers were removed from relevant analyses; a PRCA score of 24 that fell 3.33 standard deviations below the mean, and an FNE-B score of 11 that fell 3.17 standard deviations below the mean. With the goal of obtaining the best linear unbiased estimates, the assumptions of regression were tested according to the guidelines provided by Field (2005). The RQ scores failed to meet the assumptions of normality, and a Square Root transformation was performed. Because parallel analyses of both the raw scores and transformations of the raw scores revealed comparable results, the analyses of untransformed scores are reported.

A power analysis was conducted to assess the ideal sample size needed to detect the desired effects using a formula from Bakeman (1999). Power and alpha were set at .80 and .05 respectively, and a moderate effect size of .15 was chosen based on recommendations from Cohen and colleagues (1983) for hierarchical regression analyses involving two independent variables. In addition, Cohen (1992) recommended adding 20% to the calculated sample size in an effort to minimize the influence of missing data, incomplete measures, and technical error. In this study, the required sample size is 82 participants. The current N of 98 suggests that the present study had sufficient power to test the hypotheses of the current study.

CHAPTER 3.

RESULTS

Correlations and descriptive statistics for the mindfulness, rumination, and social anxiety measures are shown in Table 1. As expected the social anxiety and public speaking measures were all positively correlated with each other. All study measures demonstrated adequate internal consistency. The Cronbach's alpha and average inter-item correlations for each measure are presented in Table 2. Demographic variables were examined as possible covariates. The only demographic variable associated with social anxiety measures was education level, which was significantly associated with participants LSAS-fear scores, $r(96) = -.22, p < .05$.

Hypothesis I

In order to test the hypothesis that mindfulness is negatively related to levels of social anxiety and public speaking fears, scores from each of the social anxiety measures (FNE; LSAS-fear; LSAS-avoidance; PRCA) were regressed onto mindfulness scores (MAAS) in separate, ordinary least squared regression analyses. Results from the individual regression analyses examining the relationship between self-report mindfulness and levels of social anxiety are presented in Table 3. There was a significant negative relation between mindfulness scores (MAAS) and social anxiety as measured by the FNE-B, $t(96) = -3.83, p < .001, R^2 = .13$, the LSAS-fear subscale, $t(97) = -4.55, p < .001, R^2 = .18$, and the LSAS-avoidance subscale, $t(97) = -4.38, p < .001, R^2 = .17$, such that those scoring higher on mindfulness reported lower levels of social anxiety. However the PRCA was not significantly associated with mindfulness scores (MAAS), $t(96) = -.15, p = .88, R^2 = .00$. Because education level was identified as a covariate with LSAS-fear scores, the relation between MAAS and LSAS-fear scores was tested again,

holding education levels constant. The association remained significant, $t(95) = -4.15, p < .001$, $R^2 = .20$.

Hypothesis II

The hierarchical regression technique specified by Baron and Kenny (1986) was used to test the hypothesis that post-event rumination (RQ) would mediate the relation between mindfulness (MAAS) and levels of social anxiety and public speaking fears (FNE-B; LSAS-fear; LSAS-avoidance; PRCA). This method states that in order to establish a mediation effect 1) there must be a relation between the independent variable and the dependent variable, 2) a) there must be a relation between the independent variable and the mediation variable, and b) between the mediation variable and the dependent variable, and 3) when the independent variable and the mediation variables are entered simultaneously in a regression equation, the relation between the independent variable and the dependent variable significantly decreases or drops from significance.

Results from Hypothesis I confirm a significant relation between the independent variable (MAAS scores) and three of the four dependent variables (FNE-B; LSAS-fear; LSAS-avoidance); thus, satisfying Baron and Kenny's first criteria for mediation analysis. Because there was no significant relation observed between mindfulness and public speaking fears as measured by the PRCA, the PRCA was excluded from further analyses. In order to establish a relation between the independent variable and the mediator (criteria 2a), RQ scores were regressed onto MAAS scores. There was not a significant relation between MAAS and RQ scores, $t(97) = -.72, p = .47, R^2 = .01$. Additionally, to test whether a relation between the mediator and the dependent variables could be established (criteria 2b), social anxiety scores (FNE-B; LSAS-fear; LSAS-avoidance) were regressed onto RQ scores. Post-event rumination

scores (RQ) were not significantly associated with social anxiety as measured by the FNE-B, $t(96) = 1.84, p = .07, R^2 = .04$, the LSAS-fear subscale, $t(97) = .82, p = .42, R^2 = .01$, or the LSAS-avoidance subscale, $t(97) = -.39, p = .70, R^2 = .00$. Because there was not a significant relation between the mediator and either the independent or the dependent variables, no further analyses were conducted. Results indicate that in the present sample post-event rumination did not act as a mediator for the relation between mindfulness and levels of social anxiety.

Table 1

Correlation and Descriptive Statistics of Variables

	MAAS	RQ	FNE-B	LSAS-fear	LSAS-avoidance	PRCA
MAAS	1.00					
RQ	-.07	1.00				
FNE-B	-.37**	.19	1.00			
LSAS-fear	-.42**	.08	.46**	1.00		
LSAS-avoidance	-.41**	.04	.39**	.80**	1.00	
PRCA	-.02	.08	.21*	.35**	.36**	1.00
Mean	60.96	25.51	30.16	28.36	24.59	44.43
SD	15.07	6.00	6.14	10.40	10.08	5.83

Note. MAAS = Mindful Attention Awareness Scale; RQ = Rumination Questionnaire; FNE-B = Fear of Negative Evaluation – Brief form; LSAS-fear = Liebowitz Social Anxiety Scale – fear subscale; LSAS-avoidance = Liebowitz Social Anxiety Scale – avoidance subscale; PRCA = Personal Report of Communication Apprehension.

* $p < .05$, ** $p < .01$

Table 2

Internal Consistency for the Study Measures in the Present Sample

Study Measures	Cronbach's Alpha	Average Inter-item Correlations
MAAS	.91	.40
RQ	.76	.39
FNE-B	.81	.24
LSAS-fear	.89	.24
LSAS-avoidance	.86	.20
PRCA	.75	.23

Note. MAAS = Mindful Attention Awareness Scale; RQ = Rumination Questionnaire; FNE-B = Fear of Negative Evaluation – Brief form; LSAS-fear = Liebowitz Social Anxiety Scale – fear subscale; LSAS-avoidance = Liebowitz Social Anxiety Scale – avoidance subscale; PRCA = Personal Report of Communication Apprehension.

Table 3

Results of the Individual Regression Analyses Exploring the Relationship between Self-Report Mindfulness and Social Anxiety

Regression Analysis	R ²	b	SE _b	β	t
MAAS					
FNE-B	.13	-.15	.04	-.37	-3.83**
LSAS-fear	.18	-.29	.06	-.42	-4.55**
LSAS-avoidance	.17	-.27	.06	-.41	-4.38**
PRCA	.00	-.01	.04	-.02	-.15

Note. MAAS = Mindful Attention Awareness Scale; FNE-B = Fear of Negative Evaluation – Brief form; LSAS-fear = Liebowitz Social Anxiety Scale – fear subscale; LSAS-avoidance = Liebowitz Social Anxiety Scale – avoidance subscale; PRCA = Personal Report of Communication Apprehension. **p < .001

CHAPTER 4.

DISCUSSION

The purpose of the present study was to explore the relation between levels of self-report mindfulness and levels of social anxiety and public speaking fears in a sample diagnosed with social phobia. In addition, post-event rumination was examined as a possible mediator of the proposed relation between mindfulness and social anxiety symptoms. The results predominantly support the hypothesis that self-report mindfulness is negatively related to levels of social anxiety. MAAS scores were significantly related to three of the four social anxiety measures (FNE-B; LSAS-fear, & LSAS-avoidance), suggesting that awareness of present experience throughout daily life is associated with lower levels of social anxiety among those diagnosed with social phobia. However, MAAS scores were not related to public speaking fears as measured by the PRCA. The results did not support the second hypothesis, that post-event processing (RQ) would mediate this relation between mindfulness and social anxiety. RQ scores were not significantly associated with either mindfulness or social anxiety scores in this sample. The following sections place these findings in the context of literature on the relation between mindfulness and psychopathology, addresses null findings, and discusses limitations and directions for future research.

The present research is the first known study to report a significant relation between levels of self-report mindfulness and social anxiety symptoms in a socially phobic sample. These results are consistent with a growing body of literature that has reported moderate to strong negative associations between mindfulness and psychological distress in non-clinical samples (Brown & Ryan, 2003; Baer et al., 2004; Feldman, et al., 2007; Coffey & Hartman, 2008). Although more research is needed to understand how mindfulness may be beneficial, literature

describing potential mechanisms for this relation has focused on: gaining a decentered view of one's internal experience (metacognitive awareness), reducing avoidance via exposure, improved emotional regulation, more accurate responding to situational contingencies, and reductions in ruminative processes. Early research has lent support to theories that mindfulness may be beneficial by improving emotion regulation abilities and reducing rumination (Arch & Craske, 2006; Coffey & Hartman, 2008). Two studies to date have reported mindfulness based interventions that have significantly reduced social anxiety in clinical samples (Bogels, Sijbers, & Voncken, 2006; Koszycki, Benger, Shlik, & Bradwejn, 2007). However, these studies did not include a measure of mindfulness. Future studies exploring the relation between mindfulness and social anxiety symptomatology in the context of treatment may provide more detailed information on this relation. The primary finding from the present study is encouraging of further research to understand the relation between mindfulness and social anxiety, as it may be clinically relevant to the treatment of this disorder.

It is notable that mindfulness scores (MAAS) in this sample ($M = 60.96$, $SD = 15.07$) were higher than those obtained in other clinical samples ($M = 55.2$, $SD = 9.9$; Evans, Ferrando, Findler, Stowell, Smart, & Haglin, 2008), and were more equivalent to those reported from a student sample ($M = 59$, $SD = 9.6$; Brown & Ryan, 2003). This is somewhat surprising because previous literature has found that clinical samples tend to report lower levels of mindfulness than non-clinical controls (Baer, 2004; Feldman et al., 2007). This may in part reflect that the current sample also reported lower levels of social anxiety than other socially phobic samples. The mean FNE-B score for the current study was 30.16 ($SD = 6.14$) compared to a mean score of 46.91 ($SD = 9.27$) reported by Weeks and colleagues (2005) for a sample of 165 patients with a primary diagnosis of social phobia. The mean LSAS scores in the present sample were 28.36 ($SD =$

10.40) and 24.59 ($SD = 10.08$) for the fear and avoidance subscales respectively. Heimberg and colleagues (1999) reported mean scores for these subscales of 35.5 ($SD = 13.6$) and 31.6 ($SD = 14.5$) for a socially phobic clinical sample.

Mindfulness scores were not related to public speaking fears as measured by the PRCA. It is notable that this measure is not frequently used among clinical samples, but is more commonly used in the communication literature (Burk, 2001; Jordon-Jackson, & Davis, 2005). For example, the PRCA includes items that appear to address issues related to one's perceived skill and interest in communication (e.g. "I feel I am more fluent when talking to people than most other people are" & "I like to get involved in group discussions"). In contrast, the FNE-B includes a number of items that assess worry around negative evaluations, which may speak more to the interference or distress caused by social anxiety that is necessary for a clinical diagnosis (e.g. "I often worry that I will say or do the wrong things"). Although several items from the PRCA address fear in certain public speaking scenarios (e.g. "I'm afraid to speak up in conversations"), each LSAS item assesses fear and avoidance across a broad range of social situations. Although significant, the correlation between the PRCA and the FNE-B was low ($r = .21$), also suggesting that these instruments are measuring somewhat different constructs.

The hypothesis that post-event processing (post-event rumination; RQ) would mediate the relation between self-report mindfulness and levels of social anxiety was not supported. In the present sample, post-event processing was not related to either mindfulness scores or social anxiety scores. This was unexpected given that post-event processing is included in a widely accepted model outlining the development and maintenance of social phobia (Clark & Wells, 1995; Clark, 2001; Hofmann & Scepkowski, 2006). Furthermore, empirical studies have demonstrated a relation between post-event processing and social anxiety symptoms both in

student (Dannahy & Stopa, 2007; Fehm, Schneider, & Hoyer, 2006; Kashdan & Roberts, 2007; Lundh & Sperling, 2002; Mellings & Alden, 2000), and clinical samples (Abbott & Rapee, 2004; Kocovski & Rector, 2008; Perini, Abbott, & Rapee, 2006; Rachman, Gruter-Andrew, & Shafran, 2000).

A notable inconsistency in this literature has been the method by which post-event processing has been measured. Two studies with clinical samples have used a separately modified version of the Thoughts Questionnaire (Edwards, Rapee, & Franklin, 2003) to examine how frequently participants thought about varying aspects of a recent speech or social encounter (Abbott & Rapee, 2004; Perini, Abbott, & Rapee, 2006). Rachman and colleagues (2000) created their own 13-item measure, the Post-event Processing Questionnaire (PEPQ). Construct validity assessment data have not been reported or cited in any of the noted studies. Factor structure and internal consistency was reported only for the PEPQ, confirming single factor measurement and good internal consistency (Rachman et al., 2000).

The measure used to assess post-event processing in the current study (RQ) has only been used in one other study (Mellings & Alden, 2000) and has some important limitations. Although the authors report adequate internal consistency (*Cronbach's alpha* = .70), further validity assessment data have not been reported. The instrument includes only five items, which may limit its ability to fully assess the construct of post-event processing. In addition, a small number of items may have restricted the range of RQ scores, artificially attenuating the association with social anxiety. Mellings and Alden (2000) tested the association between post-event processing and social anxiety symptoms in a non-clinical, undergraduate sample. Thus, the instrument may not adequately assess the construct in a sample diagnosed with social phobia. Further, Mellings and Alden (2000) did not report if social anxiety levels and post-event rumination were linearly

related, only that those high on social anxiety reported higher levels of post-event processing. In summary, studies examining post-event processing and social anxiety have used different measures, for which limited validity data are available.

An additional inconsistency has been whether participants have been asked to report levels of post-event rumination in relation to a past event (Rachman et al., 2000), an imagined event (Kocovski, Endler, Rector & Flett, 2005), or event common to all participants (e.g. impromptu speech task; Abbott & Rapee, 2004). Variance in this area highlights several other possible sources of contamination in the measurement of post-event processing. Recall bias may affect participants' ability to report on rumination subsequent to a past or imagined event. This may be particularly true for a socially phobic client who has avoided fearful social situations for some time. In addition, the literature to date has not examined how long post-event rumination may occur subsequent to a social encounter. Biases may arise when reporting on a past situation that is no longer salient to the participant. In addition, post-event processing in the context of an artificial social encounter, such as those generated in lab research (e.g. impromptu speech), may or may not generate levels of apprehension and rumination that are generalizable to everyday experience. Thus, ecologically valid measurement of this construct remains an important area of focus for future research on post-event processing in social phobia.

Although the lack of a significant relation between rumination and social anxiety contradicts the majority of prior research, one study employing a revised version of the PEPQ (PEPQ-R) found that post-event processing was not related to social anxiety as measured by the Social Phobia Scale (SPS; Mattick & Clarke, 1998) or the Social Interaction and Anxiety Scale (SIAS; Mattick and Clarke, 1998) in a clinical sample (McEvoy & Kingsep, 2006). In this study, the amount of *state* anxiety experienced during a social situation was the strongest predictor of

subsequent post-event processing of that particular event. The authors suggest that post-event processing may be a maladaptive affect regulation strategy that is employed to reconcile the state anxiety experienced during a particular event, and may be less related to overall social anxiety symptoms (McEvoy & Kingsep, 2006). Using a strong ecologically valid design, Kocovski and Rector (2008) also found that post-event processing (PEPQ; Rachman et al., 2000) was related to state anxiety (subjective units of distress; SUDS ratings) during a social encounter. However, they also found that post-event processing was more strongly related to social anxiety than to state anxiety for two of the three social anxiety instruments included in their study; the SPS and the LSAS, but not the SAIS. The authors offer that both state anxiety and social phobia symptomatology may contribute to levels of post-event processing, with state anxiety accounting for within person variance in the amount of rumination across events.

In an attempt to replicate these findings in the present sample, the relation between RQ scores reported at the first treatment session, and state anxiety scores (SUDS ratings) during a pre-treatment behavioral avoidance task (impromptu speech) was tested post hoc. Indeed, state anxiety during the pre-treatment speech (SUDS ratings) significantly predicted post-event processing scores at session one of treatment, $t(82) = 2.04, p < .05$. Thus, in this clinical sample, post-event processing was more directly related to state anxiety during a speech task than social anxiety symptoms. Therefore, despite some mixed findings in the literature thus far, one possible explanation for the null findings of the present study is that post-event processing is more related to the state anxiety experienced in a particular social situation than overall symptoms of social phobia. Future research should aim to better understand how post-event processing functions in social anxiety disorder; as an affect regulation strategy for a specific social event, or by some other means. Future studies could attempt to replicate findings from Kocovski and Rector (2008)

and continue to include measures of state anxiety, trait anxiety (e.g. anxiety sensitivity), and specific symptomatology to test which may contribute more to post-event processing.

Post-event rumination was also unrelated to mindfulness in the present study. Although mindfulness has been found to be associated with general ruminative processes in prior research (Brown & Ryan, 2003; Baer et al., 2004; Coffey & Hartman, 2008; Feldman et al., 2007; Jain et al., 2007; Shapiro et al., 2007), it may be that mindfulness is not associated with the type of rumination associated with social phobia, post-event processing. Past studies reporting a relation between mindfulness and rumination have used the *rumination* subscales from several different measures, specifically the Rumination Reflection Questionnaire (Coffey & Hartman, 2008; Shapiro et al., 2007), the Response Style Questionnaire (Ramel et al., 2004), and the Daily Emotion Report (Jain et al., 2007). These instruments are designed to assess one's tendency for negative, repetitive, self-focused thinking, or what might be termed, general ruminative processes (e.g. "My attention is often focused on aspects of myself I wish I'd stop thinking about," & "I often reflect on episodes in my life that I should no longer concern myself with"). Because of the well documented contribution of depression to ruminative tendencies, recent literature has made an attempt to differentiate the contribution of depressive symptoms and social anxiety symptoms to post-event rumination in the context of social anxiety. This is an important distinction if the literature is to continue treating post-event processing as a construct specific to social phobia. This distinction may also have important ramifications for the treatment of social anxiety. For example, to address ruminative tendencies in relation to past social encounters may be too narrow an approach for someone for whom negative ruminative processes are a pervasive cognitive strategy.

In a socially phobic sample, Kocovski and Rector (2008) found that post-event rumination (PEPQ) was not related to rumination as a coping response to depressed mood as measured by the rumination subscale of the Response Style Questionnaire (RSQ-R; Ramel et al., 2004), and post-event rumination was significantly related to social anxiety while depressive rumination was not. In this study, participants were specifically asked to report ruminative tendencies for the RSQ-R during times when they feel “down, sad, or depressed.” These results suggest that depressive rumination and post-event processing of social situations operate independently, and that a depressive ruminative style is not related to social anxiety symptomatology. It is of note that depressive rumination was reported retrospectively to imagined depressed mood, as opposed to post-event processing which was measured in the context of a recent, personally relevant social situation.

Another recent study examined the contribution of social anxiety and depressive symptoms to post-event rumination in an undergraduate sample (Kashdan & Roberts, 2007). Although this study did not measure depressive rumination tendencies directly, depressive symptoms (BDI-II) were found to moderate the relation between post-event processing (PEPQ) and social anxiety symptoms, such that the relation between social anxiety and rumination was largely driven by those high in depressive symptoms. This suggests that both social anxiety and depressive symptoms may contribute to negative post-event processing. Although an empirical distinction has yet to be made between general ruminative processes and rumination associated with depression or social anxiety, McEvoy and Kingsep (2006) suggest that post-event processing may be a maladaptive coping strategy that is common among mood and anxiety disorders, but may take different forms depending on the diagnosis and specific target of fear. Thus, someone with panic disorder may ruminate in a similar way about their physiological

arousal that someone with social phobia would about their social presentation. In summary, although the distinction between ruminative tendencies and post-event processing in the context of social anxiety remains unclear, the possibility remains that mindfulness is unrelated to the type of rumination theorized to be specific to social phobia, post-event processing.

The use of cross sectional data is a primary limitation to the present research. Future studies should examine the relation between mindfulness and social anxiety symptoms in the context of a mindfulness based intervention. This would allow one to test whether increases in mindfulness predicted reductions in socially anxiety symptoms. The inclusion of a largely unvalidated measure of post-event processing (RQ) is another important limitation of this study. Future research in the area of post-event processing should address inconsistencies in the measurement of this construct, and work to develop a well validated instrument. Although validation of self-report mindfulness measures has been promising, it is important to acknowledge that inconsistencies exist in the measurement of this construct as well. The MAAS is a single factor measure assessing awareness of present experience in daily life (Brown & Ryan, 2003). Other self-report mindfulness instruments include subscales assessing one's ability to describe present experience, or one's ability to approach daily experience with an attitude of acceptance (Baer et al., 2004; Feldman et al., 2007). As such, results of the present study should be interpreted with caution until the field has more experience with measuring the complex construct of mindfulness.

In summary, the primary finding of the present study provides additional support for literature outlining a negative relation between mindfulness and psychopathology. Confirming this relation in a clinical sample with social phobia suggests that the construct of mindfulness may be clinically relevant to the treatment of this disorder. It is important that the field pursue an

understanding of this relation, including an understanding of the mechanisms by which mindfulness may be beneficial. Studies examining possible mediators of the relation between mindfulness and social anxiety should be conducted in the context of mindfulness interventions in order to assess the relation between these variables across the course of treatment. Addressing issues of measurement in assessing possible mechanisms of change with regard to mindfulness will be an important aspect of continuing research in this area.

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APPENDIX A: DIAGNOSTIC CRITERIA FOR SOCIAL PHOBIA

- A. A marked and persistent fear of one or more social and performance situations in which the person is exposed to unfamiliar people or to possible scrutiny by others. The individual fears that he or she will act in a way (or show anxiety symptoms) that will be humiliating or embarrassing. Note: In children, there must be evidence of the capacity for age-appropriate social relationships with familiar people and the anxiety must occur in peer settings, not just in interactions with adults.
- B. Exposure to the feared social situation almost invariably provokes anxiety, which may take the form of a situationally bound or predisposed Panic Attack. Note: In children, the anxiety may be expressed by crying, tantrums, freezing, or shrinking from social situations with unfamiliar people.
- C. The person recognizes that the fear is excessive or unreasonable. Note: In children, this feature may be absent.
- D. The feared social or performance situation are avoided or else are endured with intense anxiety or distress.
- E. The avoidance, anxious anticipation, or distress in the feared social or performance situation(s) interferes significantly with the person's normal routine, occupational (academic) functioning, or social activities or relationships, or there is marked distress about having the phobia.
- F. In individuals under age 18 years, the duration is at least 6 months.
- G. The fear or avoidance is not due to the direct physiological effects of a substance (e.g., a drug of abuse, a medication) or a general medical condition and is not better accounted for by another mental disorder (e.g., Panic Disorder With or Without Agoraphobia, Separation Anxiety Disorder, Body Dysmorphic Disorder, a Pervasive Developmental Disorder, or Schizoid Personality Disorder).
- H. If a general medical condition or another mental disorder is present, the fear in Criterion A is unrelated to it, e.g., the fear is not of Stuttering, trembling in Parkinson's disease, or exhibiting abnormal eating behavior in Anorexia Nervosa or Bulimia Nervosa

APPENDIX B: DEMOGRAPHIC QUESTIONNAIRE

Participant Number: _____

Date: _____

Gender: **M** **O**
 F **O**

Age: _____

Date of Birth: _____

Racial/Ethnic Origin:

- ☐ African American
- ☐ Caucasian
- ☐ Hispanic
- ☐ Asian American
- ☐ Pacific Islander
- ☐ American Indian
- ☐ Other _____

Highest level of Education Completed:

- ☐ Some high school
- ☐ Completed high school
- ☐ Some college (1-2 years)
- ☐ Some college (3+ years)
- ☐ Completed college degree
- ☐ Some graduate school
- ☐ Completed graduate degree

Current Marital Status:

- ☐ Single
- ☐ Married
- ☐ Separated
- ☐ Divorced
- ☐ Living with someone
- ☐ Widowed

Current Total Annual Household Income:

- ☐ Less than \$ 5,000
- ☐ \$ 5,000 - \$ 10,000
- ☐ \$ 10,000 - \$ 20,000
- ☐ \$ 20,000 - \$ 30,000
- ☐ \$ 30,000 - \$ 50,000
- ☐ More than \$ 50,000

APPENDIX C: FEAR OF NEGATIVE EVALUATION – BRIEF FORM (FNE-B)

Read each of the following statements and then use the scale below to indicate the degree to which each statement applies to you.

1	2	3	4	5 Not at
All	Slightly	Moderately	Very	Extremely

1. I worry about what other people will think of me even when I know that it doesn't make any difference.
2. I am unconcerned even if I know people are forming an unfavorable opinion of me.
3. I am frequently afraid of other people noticing my short comings.
4. I rarely worry about what kind of impression I am making on someone.
5. I am afraid that others will not approve of me.
6. I am afraid that people will find fault in me.
7. Other people's opinions of me do not bother me.
8. When I am talking to someone, I worry about what they may be thinking about me.
9. I am usually worried about what kind of impression I make.
10. If I know someone is judging me, it has little effect on me.
11. Sometime I think I am too concerned with what other people think of me.
12. I often worry that I will say or do wrong things.

APPENDIX D: LIEBOWITZ SOCIAL ANXIETY SCALE – SELF REPORT (LSAS-SR)

Fill out the following questionnaire with the most suitable answer listed. Rate your fear and likelihood of avoidance of each situation. Base your answers on your experience in the past week and, if you have completed the scale previously, be as consistent as possible in your perception of the situations described. Be sure to answer all items.

Fear or Anxiety

Avoidance

0 = None

0 = Never (0%)

1 = Mild

1 = Occasionally (1% - 33% of the time)

2 = Moderate

2 = Often (33% - 67% of the time)

3 = Severe

3 = Usually (67% - 100% of the time)

1. Telephoning in public – speaking on the telephone in a public place
2. Participating in small groups – having a discussion with a few others
3. Eating in public places – do you tremble or feel awkward handling food
4. Drinking with others in public places – refers to any beverage including alcohol
5. Talking to people of authority -- for example, a boss or a teacher
6. Acting, performing, or giving a talk in front of an audience – refers to a large audience.
7. Going to a party – an average party to which you may be invited; assume you know some but not all people at the party
8. Working while being observed – any type of work you might do including school work or housework
9. Writing while being observed – for example, signing a check in a bank
10. Calling someone you don't know very well
11. Talking with people you don't know very well

12. Meeting strangers –assume others are of average importance to you
13. Urinating in a public bathroom – assume that others are sometime present, as might normally be expected
14. Entering a room when others are already seated –refers to a small group, and nobody has to move seats for you
15. Being the center of attention – telling a story to a group of people
16. Speaking up at a meeting – speaking from your seat in a small meeting or standing up in place in a large meeting
17. Taking a written test
18. Expressing appropriate disagreement or disapproval to people you don't know very well
19. Looking at people you don't know very well in the eyes –refers to appropriate eye contact
20. Giving a report to a group – refers to an oral report to a small group
21. Trying to pick up someone – refers to a single person attempting to initiate a relationship with a stranger
22. Returning goods to a store where returns are normally accepted
23. Giving an average party
24. Resisting a high pressure sales person – avoidance refers to listening to the salesperson for too long

APPENDIX E: PERSONAL REPORT OF COMMUNICATION APPREHENSION – SHORT FORM (PRCA)

This instrument is composed of statements concerning your communication with other people.

Please indicate the degree to which each statement applies to you by using the following scale.

There is no right or wrong answer. Work quickly, just record your first impression.

1	2	3	4	5
Strongly Agree	Agree	Are Undecided	Disagree	Strongly Disagree

1. I look forward to expressing my opinions at meetings.
2. I am afraid to express myself in a group.
3. I look forward to an opportunity to speak in public.
4. Although I talk fluently with friends, I am at a loss for words on the platform.
5. I always avoid speaking in public if possible.
6. I feel that I am more fluent when talking to people than most other people are.
7. I like to get involved in group discussions.
8. I dislike to use my voice and body expressively.
9. I'm afraid to speak up in conversations.
10. I would enjoy presenting a speech on a local television show.

APPENDIX F: MINDFUL ATTENTION AWARENESS SCALE (MAAS)

Below is a collection of statements about your everyday experiences. Using the 1-6 scale below, please indicate how frequently or infrequently you have each experience. Please answer according to what *really reflects* your experience rather than what you think your experience should be.

1-----2-----3-----4-----5-----6
almost always almost never

- _____ 1. I could be experiencing some emotion, and not be conscious of it until some time later.
- _____ 2. I break or spill things because of carelessness, not paying attention, or thinking of something else.
- _____ 3. I find it difficult to stay focused on what's happening in the present.
- _____ 4. I tend to walk quickly to get where I'm going without paying attention to what I experience along the way.
- _____ 5. I tend not to notice feelings of tension or physical discomfort until they really grab my attention.
- _____ 6. I forget a person's name almost as soon as I've been told it for the first time.
- _____ 7. It seems I am "running on automatic" without much awareness of what I'm doing.
- _____ 8. I rush through activities without really being attentive to them.
- _____ 9. I get so focused on the goal I want to achieve that I lose touch with what I am doing right now to get there.
- _____ 10. I do jobs or tasks automatically, without being aware of what I am doing.
- _____ 11. I find myself listening to someone with one ear, doing something else at the same time.
- _____ 12. I drive places on "automatic pilot" and then wonder why I went there.
- _____ 13. I find myself preoccupied with the future or the past.

_____14. I find myself doing things without paying attention.

_____15. I snack without being aware that I am eating.

APPENDIX G: RUMINATION QUESTIONNAIRE (RQ)

Directions: Please consider your thoughts and feelings about the last speech or talk you gave, use the scale to answer the following questions by filling in the bubble that corresponds with your answer choice.

1. In regards to your last talk or speech, to what extent did you think about the speech since giving it?

1	2	3	4	5	6	7
○	○	○	○	○	○	○
Not at all						Very Much

2. Were your thoughts positive, negative or neutral?

1	2	3	4	5	6	7
○	○	○	○	○	○	○
Positive			Neutral			Negative

3. To what extent did you criticize yourself about not giving the talk well?

1	2	3	4	5	6	7
○	○	○	○	○	○	○
Not at all						Very Much

4. How much did you think about past talks or speeches?

1	2	3	4	5	6	7
○	○	○	○	○	○	○
Not at all						Very Much

5. To what extent did you think about the anxiety you felt during your last speech?

1	2	3	4	5	6	7
○	○	○	○	○	○	○
Not at all						Very Much