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Associations Between Mindfulness and Symptoms of Anxiety

A thesis

presented to

the faculty of the Department of Psychology

East Tennessee State University

In partial fulfillment

of the requirements for the degree

Master of Arts of Clinical Psychology

by

Leisa L. Wells

August 2010

Dr. Jon Webb, Chair

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Keywords: Mindfulness, Meditation, Anxiety, Obsessive-Compulsive Symptoms, Stress

ABSTRACT

Associations Between Mindfulness and Symptoms of Anxiety

by

Leisa L. Wells

This cross-sectional exploratory study considered the associations between mindfulness and symptoms of anxiety. The participants in this study were 183 undergraduate students at a regional university in the southeastern United States. The general hypothesis was that higher levels of mindfulness would be associated with lower levels of anxiety. Hierarchical multiple regression analyses were used to examine the association between a variety of aspects of mindfulness and symptoms of anxiety while controlling for a variety of demographic and historical variables, including previous experience with meditation. Results suggest that not all aspects of mindfulness were related to anxiety. Of the 12 specific aspects of mindfulness measured, Cognition, Affect, Act with Awareness, and Nonjudge were the most common predictors of anxiety, obsessive-compulsiveness, and stress. Continued research is warranted, including basic relationships, as well as longitudinal and interventional designs.

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CHAPTER 1

Introduction

Traditional approaches to the treatment of anxiety disorders include Cognitive Therapy (CT), Behavioral Therapy (BT), Exposure and Ritual Prevention (ERP), a particular form of Cognitive Behavioral Therapy (CBT), and psychopharmacology. Sometimes conventional treatments may not work for anxiety and at other times they may only work partially. Other forms of treatment, including alternative or nontraditional forms of treatment for anxiety are warranted.

Mindfulness Meditation, one such alternative form of treatment, is being used to aid in overcoming anxiety (Kabat-Zinn et al, 1992), fear and panic (Brantley, 2003) and stress (Kabat-Zinn, 1990). Mindfulness, the fundamental aspect of this approach to treatment, is often spoken of as “insight,” meaning “a deep, penetrative nonconceptual seeing into the nature of the mind and world” (Kabat-Zinn, 2003, p.146). Mindfulness is thought to allow the one meditating to observe the anxious thoughts without judgment, recognize them simply as thoughts arising in the present moment, and maintain a calm center that is not defined by fear or anxiety (Brantley, 2003). While research has been conducted to examine the effect of mindfulness-based meditation on anxiety, the evidence in support of its salutary effect is unclear, including an apparent relative lack of basic research into the association between mindfulness and anxiety.

The goal of this study is to consider the basic association between symptoms of anxiety and general and specific aspects of mindfulness. An overview of anxiety including basic anxiety, obsessive compulsiveness, and stress and traditional treatments thereof will be provided, followed by an overview of mindfulness including how it may be used to alleviate symptoms of anxiety.

Anxiety

Large numbers of people experience inappropriate or excessive amounts of anxiety and when it is experienced, anxiety is a very prominent and pervasive emotion for the individual (Rachman, 2004). The primary component of anxiety is the fear that something bad is going to happen. Anxiety is manifested in different ways by different people. A general condition of all anxiety disorders is worry. In some anxiety disorders the content of worry is not that different from “normal” worry; the concern or worry tends to be about family, work, and illnesses although the worries are less realistic and less controllable than normal (McLean & Woody, 2001).

Different from fear, which is a short-term response to imminent danger, anxiety is apprehension about events that might harm a person in the future. Anxiety is maladaptive when it is in response to a perceived danger that is not real (Germer, 2005). An example of fear may be that a vehicle will break down if it is making an unusual noise, whereas anxiety would be anticipating something tragic happening to a loved one every time he or she leaves the house.

Anxiety disorders are considered to be caused and maintained by a disturbance in information processing. This may lead to an overestimation of danger or perceived threat and with that an underestimation of the person’s ability to cope (Beck, Emery, & Greenberg, 1985).

General symptoms of anxiety. Symptoms of anxiety found in the Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition, Text Revision (DSM-IV, TR) include restlessness, being easily fatigued, difficulty concentrating, irritability, muscle tension, and disturbed sleep (American Psychiatric Association [APA], 2000). Worry may also be accompanied by somatic complaints of motor tension such as feeling shaky, tense, jumpy, and

cranky (McLean & Woody, 2001). Other physical symptoms include nausea, urinary frequency, queasy stomach, and difficulty swallowing (Rachman, 2004).

Disorders related to anxiety. Symptoms of anxiety can manifest in a variety of DSM IV-TR (2000) disorders including disorders specific to the official category of Anxiety Disorders. Following is a brief description of a few such disorders.

Anxiety may manifest as a panic attack that can occur with any of the anxiety disorders, other mental disorders, and some general medical conditions (APA, 2000). Symptoms of panic attacks can include palpitations, sweating, trembling, sensations of shortness of breath or smothering, dizziness, depersonalization, fear of losing control, fear of dying, paresthesias, and chills or hot flushes (APA, 2000). Panic is an episode of intense fear with sudden onset (Rachman, 2004). The fear, often close to terror, is accompanied by disturbing bodily sensations, difficulty in reasoning, and a feeling of imminent catastrophe. Panic attacks may occur unpredictably and inexplicably and are a main feature of Panic Disorder (Rachman, 2004). The person may experience ongoing concern about having another panic attack, worry about the consequences of the attacks, or have a significant behavioral change related to having the attacks. An example of such a behavior change is being afraid of social situations or crowded places for fear that another attack may happen. An unexpected or uncued panic attack is one that the individual does not immediately associate with a situational trigger. Situational triggers can include stimuli that are either external such as a phobic object or internal such as physiological arousal (Rachman, 2004).

When the intensity, duration, or frequency of anxiety symptoms and worry are greatly out of proportion to the actual situation and a specific target or source is not identifiable, a diagnosis of Generalized Anxiety Disorder (GAD) may be warranted (APA, 2000). According to the

DSM-IV, TR (APA, 2000) individuals with GAD experience somatic symptoms such as sweating, nausea, and diarrhea and an exaggerated startle response. The person experiencing GAD finds it difficult to control the worry. Present are also feelings of restlessness, muscle tension, irritability, trouble concentrating, and sleep disturbance. A diagnosis of GAD also likely represents impairment in social or occupational functioning (APA, 2000).

Agoraphobia is anxiety about being in places in which escape may be difficult or embarrassing or situations in which help is not available in the event of a panic attack (APA, 2000). The anxiety of agoraphobia can lead to avoidance of certain situations such as being alone, being away from home, being in a crowd of people, traveling in a car, bus, or airplane, or being on a bridge or in an elevator (APA, 2000). Most people with agoraphobia experience anxiety about future panic attacks and they tend to imagine situations in which they might be embarrassed, in danger, or trapped. The extent of the agoraphobia appears to affect the course and outcome of the treatment (McLean & Woody, 2001).

Anxiety symptoms can be severe enough to disrupt social and occupational functioning. One type of anxiety that can be very disruptive is Obsessive-Compulsive Disorder (OCD). Recurrent, intrusive, and distressing thoughts are called obsessions and repetitive behaviors are called compulsions (Maltby & Tolin, 2003). Compulsions are repetitive behaviors or mental acts that the person feels driven to perform in response to an obsession (APA, 2000). The most common symptoms of OCD are checking such as going back numerous times to ensure that the doors are locked or that the stove is turned off and washing, including but not limited to hands, clothes, or door knobs. Together these account for 50% of OCD cases (Maltby & Tolin, 2003). Compulsions are considered to be either actions or thoughts and are differentiated from obsessions by their function. Obsessions generate anxiety, whereas compulsions are completed

either to reduce anxiety or are done in an effort to prevent a perceived consequence (Maltby & Tolin, 2003). Obsessive-compulsive disorder is described in the DSM-IV, TR (APA, 2000) as causing marked distress, being time consuming, or significantly interfering with the individual's normal routine.

Conventional treatments for anxiety. There are four main treatments for the symptoms of anxiety. These are Cognitive Therapy (CT), Behavior Therapy (BT), Exposure and Ritual Prevention (ERP), and psychopharmacology.

Cognitive therapy. The goal of CT is to teach patients to identify and correct their dysfunctional beliefs about feared situations (Maltby & Tolin, 2003). Rational Emotive Behavior Therapy (REBT), a form of CT, is often used to identify irrational thoughts. Irrational thoughts usually decrease the person's happiness, increase his or her pain, and prevent him or her from fulfilling future desires. These irrational thoughts are related to magical thinking that are empirically unsound hypotheses having no factual evidence (Ellis, 1973). Also, these irrational thoughts may be normal unpleasant thoughts that are perceived as harmful, immoral, or dangerous. These irrational thoughts may also be an overgeneralization of reality such as thinking that contact with all germs is dangerous (Maltby & Tolin, 2003). Such irrational beliefs are identified and targeted through rational debate. Almost all self-defeating behavior results from some kind of basic ignorance or lack of insight on the part of the person (Ellis, 1975). It is argued that human emotions do not magically exist in their own right and do not mysteriously come from unconscious needs and desires. Rather, emotions almost always directly come from ideas, thoughts, attitudes, or beliefs and usually can be radically changed by modifying one's thinking processes. An understanding of one's self-defeating behavior can lead to far-reaching changes in one's thoughts and actions (Ellis, 1975).

Socratic questioning is used in CT to challenge the validity of distorted thoughts and thought processes (Hannan & Tolin, 2005). As such, REBT teaches people with anxiety to identify their “automatic” evaluations of feared situations, to identify the logical inconsistencies in their thoughts, and to learn more adaptive ways of thinking (Hannan & Tolin, 2005).

A study by Borkovec and Costello (1993) included self-controlled desensitization and CT. Self-controlled desensitization involves teaching clients to achieve deep relaxation followed by confronting imagined or external anxiety cues. The clients mentally rehearsed using their relaxation skills in the presence of real or imagined anxiety-provoking cues. This was done over repeated sessions until the cues no longer generated sustained anxiety.

In a study conducted by Arntz (2003) patients with anxiety who received cognitive therapy showed moderate but statistically significant improvements. However, these improvements were the same as the comparison treatment group that received applied relaxation treatment. In both groups the recovery rate was slightly over 50%.

Behavior therapy. Behavior therapy uses methods such as relaxation training and gradual exposure to the situations or objects causing the fear and anxiety as a way of coping with the fear. One of the oldest behavior interventions used to treat obsessive thinking is called *thought stopping*. People with obsessive thoughts are taught to respond to these thoughts by saying “stop!” out loud. After saying this out loud for a period of time, the patient is then told to whisper the word “stop” and then just to say it in his or her mind. Other strategies of behavior therapy are snapping a rubber band against the wrist when obsessive thinking starts or the use of electric shock to try to eliminate the obsession (Hannan & Tolin, 2005).

Cognitive behavioral therapy. Some forms of treatment combine cognitive and behavior strategies together and include having the client write down dysfunctional thoughts, identifying

automatic thoughts, labeling distortions such as the client thinking he or she is a terrible person due to forgetting a friend's birthday, and seeking alternative explanations for the anxiety (McLean & Woody, 2001). The first step is to help the client identify and list imagined catastrophic outcomes related to bodily sensations such as heart palpitations and shortness of breath. The second step involves producing alternative explanations for the feared bodily sensations. Cognitive behavior therapy (CBT) teaches the person to recognize thought patterns, body sensations and situations that trigger these fears and different ways of reacting (Brantley, 2003).

According to Orsillo, Roemer, and Holowka (2005) the basic premise of CBT, that cognition predicts behavior, has not been convincingly supported. Another problem with CBT, according to Arntz (2002), is that it is not uniquely associated with changes in the person's cognition. Research supporting CBT has not yet demonstrated how irrational thoughts are acquired, who acquires these thoughts, and how these irrational thoughts can be measured independently of anxiety or panic (Bouton, Mineka, & Barlow, 2001).

Exposure and ritual prevention. A form of Cognitive Behavior Therapy (CBT), ERP is used primarily to treat obsessive thinking, compulsive behaviors, panic, and agoraphobia. It consists of gradual, prolonged exposure to fear-eliciting situations together with strict abstinence from the compulsive behavior (Maltby & Tolin, 2003). Although there are limitations to ERP, it is the conventional treatment of choice for agoraphobia. Clients are exposed to actual situations or places they have become too frightened to approach on their own. This exposure is initially done with a therapist but can later be used with a spouse or significant other (McLean & Woody, 2001).

Schwartz (2002) spoke of using ERP to treat clients with OCD. The therapist presents triggers such as contact with bodily fluids or touching things that the client may believe to be contaminated to the client. The trigger is the “exposure” part of the process. The “response prevention” keeps the client from responding to the trigger such as washing after touching what the client considers to be contaminated. The opinion of ERP held by Schwartz is that this type of treatment seemed “cruel and distasteful in the extreme” but also unnecessary (p.3).

Panic control treatment. Another type of exposure-based treatment, called Panic Control Treatment (PCT), was developed by Barlow and Craske (1989). This includes educational and coping components such as controlled breathing, relaxation, and cognitive reattribution used to help clients reinterpret and control feared bodily sensations that are intentionally provoked in the therapy setting. In a controlled clinical trial, the 15-week PCT yielded a recovery rate of 79% by the end of treatment, compared to a 40% recovery rate for a progressive muscle relaxation group and a 33% recovery rate for waiting list controls (Barlow, Craske, Cerny, & Klosko, 1989).

Psychopharmacology. The fourth conventional treatment for anxiety disorders is psychopharmacology. Commonly used are selective serotonin reuptake inhibitors (SSRIs) such as Prozac, Zoloft, and Luvox (Maltby & Tolin, 2003). For persons who do not respond to SSRIs or only have a partial response, there have been studies that showed Risperdal, an antipsychotic medication, to be effective in conjunction with an antidepressant such as SSRIs (Hollander et al., 2002). For obsessive thinking, Anafranil, a tricyclic antidepressant, was shown to yield higher success rates than SSRIs in meta-analytic studies (Hollander et al.). Benzodiazepines have been used if the anxiety is extreme or interferes with daily living (Rachman, 2004). If benzodiazepines are used incorrectly, they can be habit-forming. These drugs include Ativan, Xanax, and Klonopin and work as agonists on the neurotransmitter GABA. This is one of the

major neurotransmitters in the brain and tends to be inhibitory in nature (Root, 2000). Xanax in particular works to ward off actual panic attacks not just anticipatory anxiety.

Mindfulness as an Alternative Treatment

In 1979 Jon Kabat-Zinn began the Mindfulness-Based Stress Reduction program (MBSR) at the University of Massachusetts Medical Center in Worcester, MA (Brantley, 2005). The program was based on Buddhist meditation practices. However, the program did not try to be “Buddhist” or to convert anyone to Buddhism. One intended purpose of the program was to train individuals to practice mindfulness meditation for the purpose of improving health and stress reduction. The other intended function of the MBSR program was to be used in a variety of health care settings where stress, pain, illness, and disease were primary concerns (Brantley, 2005). Since the MBSR program began in 1979, Kabat-Zinn and colleagues have taught over 15,000 participants to practice mindfulness-based meditation. This does not include the individuals trained in over 250 similar programs around the world (Wylie & Simon, 2004).

What mindfulness is. Most writers on mindfulness agree that the process of mindfulness is characterized by attention or awareness in the present moment, and that the quality of this attention or awareness is critical (Block-Lerner, Salters-Pedneault, & Tull, 2005). Kabat-Zinn operationally defined mindfulness as: “the awareness that emerges through paying attention on purpose, in the present moment, and nonjudgmentally to the unfolding of experience moment by moment” (Kabat-Zinn, 2003, p. 145). Similarly, Marlatt and Kristeller (1999) defined mindfulness as, “bringing one’s complete attention to the present experience on a moment to moment basis” (p. 68). Brown and Ryan (2003) and Brantley (2005) also endorsed definitions of mindfulness that were grounded in the ideas of intentional awareness and the nonjudgmental acceptance of the present moment. Baer (2003) considered these definitions of

mindfulness that were being presented and then proposed one of her own. “Mindfulness is the nonjudgmental observation of the ongoing stream of internal and external stimuli as they arise” (p. 125), formally pointing out that awareness is not entirely about the internal stimuli.

Dimidjian and Linehan (2003) took a slightly different direction with their description of mindfulness, breaking the idea into two parts: the “how” and the “what” of mindfulness. The “how” qualities relate to the way mindfulness activities are done (nonjudgmentally, with acceptance, in the present moment, and with beginner’s mind). The “what” qualities are what one does when practicing mindfulness (observing, noticing, bringing awareness, describing, labeling, noting, and participating). Linehan (1993a, 1993b) held the position that the development of mindfulness skills leads to a state of balance between emotions and reason.

Mindfulness is not merely a good idea that once one hears about it he or she can immediately decide to live in the present moment with the promise of reduced anxiety, greater performance, and heightened life satisfaction and then instantly realize that state of being. Mindfulness is more related to an art form that is developed over time and greatly enhanced through regular practice both formally and informally on a daily basis (Kabat-Zinn, 2003).

Mindfulness was first described 2500 years ago by Gautama Buddha (Schwartz, 2004). While mindfulness is the foundation of the Buddha’s philosophy when used in the context to help with mental development, such as OCD, it does not necessarily have a religious context (Schwartz, 2004). When mindfulness is removed from its religious, cultic, or esoteric mythology, it should be grounded in another culture-bound ideological framework to provide meaning such as in a therapeutic relationship (Kutz, Borysenko, & Benson, 1985).

The effects of mindfulness. Practicing mindful awareness is how one develops insight and self-realization (Das, 1997). As one begins to be mindful, living in the “now” and directing

one's attention to the smallest increment of the present instant, something extraordinary is thought to happen. One begins to relinquish fascination with both the past and the future. The person stops living in fantasies, fears, and anticipation of the future. The person also learns to let go of time-consuming preoccupations with the past or what might have been (Das, 1997).

Paying attention to the present moment has many rewards, giving the person "enhanced satisfaction, broad vision, greater mastery and effectiveness" in everything one does (Das, 1997, p. 305). Mindfulness practice is an effective way of helping one deal with feelings. The person becomes aware of his or her feelings as they arise in the moment; they are experienced without being suppressed or denied. Mindfulness allows one to be more in touch with one's feelings without being driven or controlled by the emotions (Das, 1997).

As mindfulness develops one's entire experience of life changes. One's very sensation of being alive and conscious becomes lucid and precise not just a background for one's preoccupations (Gunaratana, 2002). Nothing is glossed over or taken for granted; no experiences are labeled as simply "ordinary" (Gunaratana, 2002, p. 170). When one is mindful, he or she can consistently observe with bare attention the breath and mental phenomenon. The person feels stable, increasingly moored in the simple experience of moment-to-moment existence. Once the mind is free from thought, it becomes clearly awake and at rest in an utterly simple awareness (Gunaratana, 2002). The breath becomes something alive and fascinating. It is no longer something that is experienced in time. It is seen as the present moment itself.

Germer (2005) presented three reasons why a mindfulness-based approach may improve treatment compliance. First, the treatment protocol is *flexible*. The mindfulness approach honors the treatment alliance, the client's motivation, and the client's unique life circumstances. Second, the treatment is *positive and accepting*. In many treatments, it is assumed that

something is wrong with the client that needs to be fixed. The mindfulness approach recognizes what is happening in the present and allows it to unfold in a relaxed way (Germer, 2005). To make progress in treatment the client must stop judging and fighting against himself or herself. Third is the treatment's *therapeutic fit*. Some clients seek therapists who meditate or have a mindfulness frame of reference. Matching clients to treatments seems related to positive outcome (Mattson, 1995).

The practice of mindfulness. The practice of mindfulness is the actual engagement in the discipline not a rehearsal for future performances. From the beginning of practice one is reminded that mindfulness is not about getting anywhere or fixing anything. Mindfulness is an invitation to let oneself be where one already is and to know the landscape of the direct experience in each moment (Kabat-Zinn, 2003). Practicing mindfulness takes a variety of forms including formal practice that is exercised for a period of time on a regular basis. Another form is informal practice intended to cultivate a continuity of awareness in all activities of daily living (Kabat-Zinn, 2003).

Practicing mindfulness encourages a “wise relationship” (p. 172) toward one’s own inner life (Greeson & Brantley, 2009). A wise relationship is based in accurate perception and experience of thinking, feeling, and physical sensation including fear and anxiety. The mindfulness practice of having a wise relationship with one’s inner perceptions brings healing benefits to the experiences of anxiety and fear. When the person is unaware of the actual activities in the present moment, he or she is more likely to be overcome by a large amount of cognitive interpretations about the experience that may be inaccurate and anxiety provoking.

The informal and formal practice of mindfulness. There are several methods that can be used to teach mindfulness. Kabat-Zinn (1994) encouraged focusing on the breath. He said

that when a person brings awareness to his or her breathing, he or she attends to the present and focuses on what is already happening. People accomplish mindful awareness through a regular daily practice involving both informal and formal observances (Miller, Fletcher, & Kabat-Zinn, 1995). Informal practice is paying attention to one's self in one's surroundings and being fully awake and focused on the present moment (Kabat-Zinn, 1990). Using informal practice, it is important to tune in to the breath during moments throughout the day (Kabat-Zinn, 1990). The breath is the bridge that connects life to consciousness and unites the body to one's thoughts. When the mind becomes scattered, the breath can be used to take hold of the mind again (Nhat Hanh, 1975). The key to mindfulness is keeping one's practice active and ongoing.

Formal practice includes sitting and focusing on the breath, yoga, and the body scan. Yoga, developed in ancient India, refers to an integrative physical and spiritual practice that involves sequences of postures using regulated breathing and focused attention (Salmon, Lush, Jablonski, & Sephton, 2009). The most widely used type of yoga is hatha yoga, and it is the one implemented by Kabat-Zinn in the MBSR program. The body scan is a lying-down meditation that guides the person to paying attention directly and systematically to each part of the body (Williams, Teasdale, Segal, & Kabat-Zinn, 2007).

Paying attention in these ways is the exact opposite of the kind of ruminative thinking that makes low moods persist (Williams et al., 2007). Williams and colleagues explained three properties of mindfulness. First, mindfulness is *intentional*. Being mindful means having more awareness of present reality and the choices available. Second, mindfulness is *experiential* and focuses directly on present-moment experience. Third, mindfulness is *nonjudgmental*. It allows the person to see things as they actually are in the present moment and to allow things to be as

they already are. In contrast judging and evaluating are essential to rumination (Williams et al., 2007).

Mindfulness-based meditation. Perhaps the most common expression of mindfulness as a formal practice is in the context of meditation. According to Kabat-Zinn (1990) there are seven essential attitudes to have for mindfulness-based meditation. They are: *non-judging*, *patience*, *beginner's mind*, *trust*, *non-striving*, *acceptance*, and *letting go*. The first attitude is *non-judging*. When the mind experiences something, it immediately judges whatever it comes in contact with and determines if the experience is good, bad, or neutral. To find a more effective way of handling stress one needs to be aware of the constant judging that the mind engages in and acknowledge one's own prejudices and fears to free oneself from them (Kabat-Zinn, 1990). Kabat-Zinn (1990) recommends becoming an impartial witness to these judging thoughts and observe them without judging them.

The second attitude is *patience*. Kabat-Zinn (1990) asked why a person should rush through bad moments to get to better ones when the one he or she is experiencing is the only one he or she has. Patience is the ability to face a difficult situation with calmness and self-control (Brantley, 2003).

Beginner's mind is the third attitude. This is seeing ordinary experiences as if seeing them for the first time. It is not letting what the mind thinks it knows interfere with living in the present moment. Using the beginner's mind prevents people from getting stuck in the rut of their own expertise and allows them to be receptive to new possibilities (Kabat-Zinn, 1990). Beginner's mind is a familiar concept in the Zen tradition and describes qualities of mindfulness such as openness, receptiveness, and readiness to learn (Goodman, 2005).

A fundamental part of learning to meditate is learning to *trust* oneself and one's own feelings. It is important to learn to trust one's own authority rather than always looking to outside authority. In the process of learning to trust, one learns what it really means to be one's own person and to live authentically (Brantley, 2003).

Non-striving is the fifth attitude. Kabat-Zinn (1990) said that when people are referred to his stress reduction clinic they are asked to identify three goals that they want to work toward in the program. Then they are told not to try to make any progress toward these goals for the time they spend in the program. Non-striving is simply letting the experience be present from moment to moment without trying to change anything.

Acceptance, the sixth attitude, means seeing things as they actually are in the present moment. Acceptance does not mean taking a passive attitude toward everything or having to like everything and rejecting one's values and principles. Acceptance is cultivated by taking each moment as it comes and being with it fully as it is (Kabat-Zinn, 1990).

The seventh attitude is *letting go* or non-attachment. When thoughts are pleasant, the mind tries to hold on to them and think about them over and over. When thoughts or situations are unpleasant, the mind tries to avoid or escape from these thoughts. In mindfulness meditation letting go is a way of letting things be, moment to moment and accepting things as they are (Kabat-Zinn, 1990). The mind attaches itself to ideas, beliefs, and views about ourselves, others, and situations. Mindfulness is about not judging and letting the experience be what it is moment by moment (Brantley, 2003).

According to Kabat-Zinn (2003) taking a witnessing stance towards internal experience allows the person to learn to notice thoughts, feelings, and somatic sensations without trying to evaluate their truth, importance, or value. The person notices his or her thoughts, feelings, and

sensations without trying to escape, avoid, or change them. By doing this mindfulness may help people live satisfying lives even when experiencing anxiety instead of being concerned with attempting to control emotional experiences or actively trying to change the content of their thoughts.

True present-moment awareness is the key to changing one's relationship with anxiety. Mindfulness allows you to observe the anxious thoughts without judgment, recognizing them as simply thoughts arising in the present moment, and maintaining a calm center or state of mind without fear (Brantley, 2003). The awareness one develops through mindfulness does not try to change anything. Change comes later and is led by awareness. It is likely that one will make changes in how one deals with fear, anxiety, stress, and panic but only after one has experienced fear, anxiety, stress, and panic deeply with mindfulness. Acceptance and openness to what arises in the present moment is crucial (Brantley, 2003). It may help to view mindfulness meditation and its application to healing one's life as a journey. It is an ongoing process, changing in each moment, and changing over time as one develops consistent habits of attention and presence (Brantley, 2003).

Mindfulness and anxiety. Although fear and anxiety are perceived in the brain, the response is usually the most noticeable in the body. Fearful cognitive interpretations as well as emotional and somatic arousal can manifest in numerous physiological symptoms including muscle tension, racing pulse, high blood pressure, irregular heartbeat, trouble breathing, and gastrointestinal disturbance (Greeson & Brantley, 2009). With an anxious cognitive mindset, these somatic symptoms may be seen as evidence of harm, which could result in even more attention devoted to the symptoms, acute panic, catastrophic thinking, emotional distress, and even a feeling of impending doom (Greeson & Brantley, 2009). Because these internal

experiences are unpleasant, they are usually avoided by attempting to actively distract attention away from the inner experience and making an effort to prevent future anxiety by avoiding associated people, places, or things.

Mindfulness practice offers an alternative approach in which anxiety and fear are deliberately noticed, allowed, and responded to with openness, curiosity, and acceptance. Mindfulness practice is likely to increase distress tolerance, interrupt the habit of avoiding inner experiences, and even promote healthy mind/body functioning (Greeson & Brantley, 2009). Mindfulness can be described as an intentional willingness to completely engage with one's inner experience, moment-to-moment, with whatever pleasant, unpleasant, or neutral events that arise. By becoming aware of the possibilities available in the present moment, the person usually feels empowered to choose a wise response, even when facing upsetting internal experiences or external events as opposed to having the experiences or events determine how one will respond (Greeson & Brantley, 2009).

Using mindfulness to treat anxiety. A relative few studies have been conducted examining the empirical connection between mindfulness and anxiety. Following is a brief overview of the literature pertaining to such.

Anxiety disorders in general. Kabat-Zinn and colleagues (Kabat-Zinn et al., 1992) conducted a study to test the effectiveness of mindfulness in treating anxiety disorders. There were 22 participants; 10 had panic disorder with agoraphobia, 4 had panic disorder without agoraphobia, and 8 had generalized anxiety disorder. The participants were given a series of written measurements on four separate occasions: at recruitment, at pretreatment, at posttreatment, and at 3-month follow-up. The treatment was an 8-week-long course in which participants attended weekly 2-hour classes and a 7.5-hour intensive and mostly silent meditation

retreat during the 6th week. During the classes and for homework assignments the participants practiced a range of different formal and informal meditation techniques (Kabat-Zinn et al., 1992). The participants' ratings of anxiety and depression showed elevated levels before treatment, a significant decline during treatment, a relatively low level at the end of treatment, and maintenance of the lower posttreatment level over 3 months of follow-up (Kabat-Zinn et al., 1992).

Generalized anxiety disorder. A study was conducted by Evans and colleagues (2008) to assess the efficacy of using mindfulness meditation to treat GAD. At the beginning and end of the study participants completed self-report measures of anxiety, worry, depressive symptoms, and mindful awareness. Baseline mindfulness was measured by the MAAS. The 11 participants had scores on the MAAS that were significantly lower than a normative sample (Evans et al., 2008). The participants met as a group for 8 consecutive weeks for 2 hours per session. The sessions were formatted based on Kabat-Zinn's MBSR teachings. Each session focused on formal and informal MBSR techniques and included cognitive exercises. The participants were also asked to practice the formal meditation exercises for at least 30 minutes a day and to record their practice.

After the 8 weeks of treatment there were statistically significant differences in the posttreatment measures including the Beck Anxiety Scale, the Beck Depression Inventory-II, Penn State Worry Questionnaire, and the Profile of Mood States. A statistical trend was found on the MAAS from baseline to the end of the 8 weeks, indicating an increase in the mindful states in day-to-day life. Although there was a mean increase in mindfulness in day-to-day life, the difference was not statistically significant. This could be due in part to the small sample size. Evans and colleagues (2008) point out that this group as a whole had significantly lower scores

in mindful awareness at baseline compared to a normative sample and at posttreatment had reached a level of mindful awareness as high as the normative sample.

Obsessiveness and compulsiveness. Schwartz (1998) presented a way to teach mindfulness to help treat obsessiveness and compulsiveness using the four steps of his cognitive-biobehavioral treatment method. These steps are to *relabel, reattribute, refocus, and revalue*. Relabeling false or misleading thoughts promotes a feeling of increased control (Schwartz, 2002). Reattributing obsessive thoughts and compulsive urges as “false messages from the brain” allows the person to distance himself or herself from the negative condition created by the symptoms (Schwartz, 1998). Refocusing allows the person to apply awareness to a more adaptive behavior (Schwartz, 2002). Revaluing the obsessions or compulsions allow their importance and power to be diminished (Schwartz, 1998).

Singh, Wahler, Winton, and Adkins (2004) described another view of treating obsessive and compulsive symptoms through mindfulness skills by teaching the individual to accept these behaviors as an integral part of one’s life experiences. In other therapies these behaviors were viewed as entities that needed to be suppressed or removed. Singh et al. (2004) describe a case study wherein a woman with serious obsessive and compulsive symptoms learned mindfulness skills and was then able to integrate an inner and outer nonjudgmental view of herself, enabling her to make more conscious choices about actions.

Hanstede, Gidron, and Nyklicek (2008) completed a study with 17 college students from Tilburg University, The Netherlands, who presented with symptoms of moderate OCD. Hanstede et al. considered mindfulness-based interventions to be suitable in treating OCD because mindfulness teaches “letting go” of intrusive thoughts and feelings. Hanstede and colleagues hypothesized that training in mindfulness would reduce symptoms of OCD and that

these effects would be mediated with increases in letting go and decreases in thought-action fusion (TAF). Rachman (1997) noted that TAF is a central theme of OCD in which thoughts are considered to be absolute determinants of real actions.

In Hanstede and colleagues' study (2008) nine students served as controls and eight students were given mindfulness intervention. After 8 weeks of mindfulness training to the experimental group, mindfulness increased in this group ($p = .001$) but did not in the control group. The time concerning letting go increased in the experimental group ($p = .003$) but not in the control group. Hanstede et al. found a strong decrease of OCD symptoms among the eight students given the mindfulness intervention. They also noted a strong increase in levels of mindfulness including letting go and a decreased level of TAF. However, the changes in TAF did not mediate the relationship found in group and OCD symptoms at follow-up. The authors of this study said the decrease in OCD symptoms occurred because of the experimental group's increased ability to let go.

Stress. In a study by Weinstein, Brown, and Ryan (2009) 65 undergraduates were given self-report measures to assess mindfulness and baseline stress and anxiety. They were given a 3-minute mental arithmetic task while being timed. They were tested for levels of stress and anxiety 2 minutes after completing the task and again 30 minutes after they began the task. To assess their level of mindfulness the Mindful Attention Awareness Scale (MAAS) (Brown & Ryan, 2003) was given.

The results of this study demonstrated that students who scored higher on the MAAS, indicating being more mindful, perceived less stress in immediate response to an induced threat and also greater recovery time after 30 minutes. The results suggest that mindfulness helps to lessen anxiety through better stress regulation.

Comparing mindfulness-based meditation and traditional treatments for anxiety.

The mindfulness-based meditative approach used in the University of Massachusetts's stress reduction and relaxation program has some of the same attributes as the cognitive and behavioral therapeutic approaches used to treat anxiety and panic (Kabat-Zinn et al., 1992). These include a shared emphasis on noting sensations and thoughts without viewing them as catastrophic and the use of stressful situations as encouragement to engage in new behaviors. These approaches also have in common the use of homework assignments to reinforce what was learned in the group settings.

There were differences between the mindfulness model and cognitive and cognitive-behavioral models in several important respects. First, emphasis is not placed on determining if thoughts are positive, negative, or faulty as in CT (Kabat-Zinn et al, 1992). Mindfulness training does not evaluate thoughts as rational or distorted, nor does it include systematic attempts to change thoughts perceived as irrational (Baer, 2003). Unlike mindfulness, which simply observes one's thinking, REBT actively disputes irrational or dysfunctional beliefs (Ellis, 2006). With mindfulness the emphasis is placed on seeing thoughts as "just" thoughts and acknowledging the potential inaccuracy and limits of all thought not just ones that produce anxiety. There is a change from old consciousness to new consciousness when the person realizes that one's being goes deeper than his or her thoughts. At the heart of the new consciousness or awareness is the transcendence of thought or the rising above thought (Tolle, 2005). This attitude is refined during formal and informal mindfulness practice.

Second, formal meditation is taught as something to be practiced regularly regardless of one's state of anxiety. The emphasis is placed on meditation as a way of living one's life and to

develop “generic” strategies for coping with stress and pain, rather than as a technique for dealing with a specific problem such as panic (Kabat-Zinn et al., 1992).

Third, the meditation practice takes place in a nonpsychiatric medical setting with a group of patients who have a wide range of medical and psychological problems. Typically CBT based research is provided to individuals or groups of patients with a single disorder. The emphasis is placed on the meditation itself and not on a specific disorder or group of symptoms (Kabat-Zinn et al., 1992).

Fourth, there is no attempt to use systematic desensitization through induction exercises to feared internal sensations associated with panic during the stress reduction and relaxation program. Although symptoms of anxiety are not intentionally evoked, if they do arise, patients are encouraged to use this as an opportunity to engage in mindful coping strategies as opposed to patterns of emotional reactivity (Kabat-Zinn et al., 1992).

Fifth, the observational skills developed through mindfulness training differ significantly from those learned through behavioral monitoring techniques (Kabat-Zinn et al., 1992). Patients in the program are trained to initially develop one-pointed attention or concentration through systematic and continued concentration, focusing on one aspect of the person’s environment such as the breath. Concentration or one-pointed attention gives stability to the person’s capacity to observe fearful thoughts and feelings without reacting (Kabat-Zinn et al., 1992). Along with mindfulness, concentration allows for nonanalytical direct experiencing of the object of attention.

The ultimate goal of mindfulness is for the person to change the relationship he or she has with internal experiences so that thoughts, feelings, and sensations are seen as transient natural events. This is instead of seeing thoughts, feelings, and sensations as threatening reflections of

the person's psychopathology that must be suppressed or eliminated (Orsillo, Roemer, & Holowka, 2005). As the person becomes more mindful through formal practice in and outside of training sessions, the person is encouraged to apply these skills in daily life, therefore strengthening his or her ability to accept rather than react to one's own reactions and engage fully in his or her own life (Orsillo, Roemer, & Holowka, 2005).

Sustained, nonjudgmental observation of anxiety-related sensations without attempting to escape or avoid them will likely lead to reductions in the emotional reactivity typically brought on by anxiety symptoms (Baer, 2003). This approach is similar to exposure procedures described by Barlow and Craske (2000). These procedures teach clients to induce panic symptoms through activities such as hyperventilation, and to practice tolerating these sensations until they subside (Baer, 2003). However, mindfulness training does not recommend the deliberate induction of anxiety symptoms. Clients are taught to observe these sensations nonjudgmentally as they naturally occur (Baer, 2003).

Traditional CBT has a clear goal such as to change behavior or a way of thinking. Mindfulness is practiced with what seems to be a paradoxical attitude of nonstriving. Although a task is assigned, no specific goal is adopted (Baer, 2003). Participants of mindfulness-based meditation are taught to observe their thoughts, feelings, and emotions without trying to change them. These thoughts, feelings, or emotions are briefly realized, labeled (such as naming an emotion he or she is experiencing as "sadness"), and attention is then returned to the breath (Baer, Smith, & Allen, 2004). These thoughts, feelings, and emotions are observed but the individual refrains from evaluating, criticizing, or trying to change them (Baer et al., 2004). Cognitive therapy aims to change thought content while the mindfulness practice is aimed at

changing one's relationship with his or her internal responses (Orsillo, Roemer, Lerner, & Tull, 2004).

Critical Review of Mindfulness

Toneatto and Nguyen (2007) reviewed the empirical literature regarding the impact of MBSR on anxiety and depression. The practice of mindfulness seemed to alleviate symptoms of anxiety and depression. However, when active control groups were used in a study, MBSR did not appear to indicate an effect on anxiety and depression.

Toneatto and Nguyen (2007) identified 15 studies that fit their inclusion criteria. These criteria included studies published in peer-reviewed journals, used a control group, and reported results related to changes in anxiety and depression. Eight of the studies reported a significant reduction in symptoms of anxiety and depression. However, none of these studies included an active control group that included a treatment-as-usual group and a treatment-as-usual and intervention group. That is, these eight studies used either a waiting list or treatment-as-usual as a control group. There were two studies that implemented an active control group, but there were no significant findings that the mindfulness intervention indicated a change in anxiety or depression.

Toneatto and Nguyen (2007) said it was not possible to attribute the reduction of anxiety and depressive symptoms exclusively to MBSR per se. Nonspecific factors might have produced the observed benefits. The benefits of MBSR were most apparent when an active control group was not included. The authors suggest that the improvement of symptoms may have been due to variables not included in the study rather than being affected by the mindfulness intervention.

Bishop et al. (2004) criticized use of the term *mindfulness*, saying it did not have an operational definition. Mindfulness has been described by numerous researchers (Kabat-Zinn,

1990; Segal, Williams, & Teasdale, 2002), but these descriptions have not been consistent among investigators. In an attempt to codify the definition for use in research, Bishop and colleagues proposed a two-component model of mindfulness. First, the self –regulation of attention must be focused on immediate experience, allowing for awareness of the present mental events. Second, the particular mental perspective maintained must be one of curiosity, openness, and acceptance.

Ellis wrote an article in response to the mindfulness teachings of Kabat-Zinn. In the article Ellis acknowledged points made by Kabat-Zinn in other writings, and then Ellis responded to these points in his article. Ellis (2006) observed several similarities between mindfulness and REBT but proposed REBT as an alternative way of coping with anxiety and stress. Ellis disagreed with Kabat-Zinn and argued that it is acceptable to think about one's experiences, whereas the principles of mindfulness suggest that if a person thinks about his or her experiences then the moment is experienced in the person's head rather than experienced directly. Ellis hypothesized that thinking about experiences was not the problem, but rather anxious and depressed thinking causes problems. Ellis acknowledged that mindfulness-based meditation is based on Buddhist teachings yet argued that Buddhism does not tell a person not to think or desire, but that it tells the person not to obsessively think and not to raise one's desires into cravings.

Ellis also stated that Kabat-Zinn is concerned with worrisome thinking. However, because Kabat-Zinn is the founder and director of the Stress Reduction Clinic, Ellis postulated that most of Kabat-Zinn's patients are obsessively-compulsively stressed or anxious. Ellis wrote that Kabat-Zinn's patients were deliberately participating in MBSR because they are stressed out, anxious, depressed, or raging. He said that a person would not go to the time, trouble, and

expense of going for several weeks or months to the stress-reduction clinic just out of curiosity about meditation. He said it may be common to be obsessively-compulsively stressed, but not everyone is similarly afflicted. Kabat-Zinn said that the practice of mindfulness leads to remembering to be mindful in all one's waking moments (1990). Ellis disagreed, stating that this sounds obsessive and leads to the creation of anxiety.

Although Ellis did agree with several attributes set forth by mindfulness, he said that one did not need to meditate to achieve the same results. Nor did he agree that one must move beyond one's thoughts, feelings, or behaviors but rather, these must be examined to determine if they need to be changed.

Statement of the Problem

Being mindful means focusing on the present moment and not living mentally in the past or the future. This is done by focusing one's attention on the breath and being aware of one's thoughts and feelings without judging them. Mindfulness meditation can be used to treat a variety of problems. However, unlike more conventional treatments such as CT and CBT mindfulness meditation does not try to change the person, his or her situation, or the environment or to directly alleviate the anxiety.

Mindfulness has been used to help with symptom reduction for a wide variety of populations and disorders; however, empirical assessment of the basic effects of mindfulness has not received as much attention in research (Baer et al., 2008). The purpose of this study was to better understand the association between mindfulness and anxiety at a basic level. General mindfulness will be considered, as well as more specific aspects of mindfulness including nonreactivity, acting with awareness, behavior, and cognition.

Research Questions and Hypotheses

Hypotheses for the present study were guided by the following research questions. First, what is the relationship between mindfulness and symptoms of anxiety? Second, what is the relationship between mindfulness and symptoms of Obsessive Compulsive Disorder in particular? Third, what is the relationship between mindfulness and symptoms of stress? The hypotheses were that after controlling for demographic variables and confounding variables:

1. Higher levels of specific aspects of mindfulness will be associated with lower levels of symptoms of anxiety.
2. Higher levels of general mindfulness will be associated with lower levels of symptoms of anxiety.
3. Higher levels of specific aspects of mindfulness will be associated with lower levels of obsessive-compulsive symptoms.
4. Higher levels of general mindfulness will be associated with less time spent with obsessions and compulsions.
5. Higher levels of specific aspects of mindfulness will be associated with lower levels of symptoms of stress.
6. Higher levels of aspects of general mindfulness will be associated with lower levels of symptoms of stress.

CHAPTER 2

Methods

Participants

Participants of this cross-sectional, naturalistic study were undergraduate students at a mid-sized state university located in the southeastern United States. One hundred eighty-three students were recruited to participate in this study using SONA, a secure on-line research database system used by the Psychology Department. Students may have received extra credit for participating.

Measures

Several measures were used to assess the variables focused on in this study. A brief description is given for each measure as well as available reliability information. Tables 1 and 2 provide basic descriptive statistics for the variables of primary interest in this study.

Demographics and confounding variables. A demographics questionnaire (Appendix A) was given to gather basic information such as age, gender, and year in college. The participants were also asked about their meditation experience (Appendix A), history of life stressors (Appendix B), and history of treatment (Appendix A). If the participant had significant meditation experience, his or her mindfulness skills would likely be better than those who have never meditated. Also, participants may be more mindful if they have been in therapy for anxiety. Similarly, a participant may not have been as receptive to other options for treating anxiety and stress if he or she had been taking prescribed medication for anxiety at the time of the study. The Student Stress Survey (SSS) was used to measure life stressors that may have been experienced by the participants in the last 2 months (Appendix B). If the participant was under considerable stress, he or she may have responded differently to the measures. The SSS

Table 1

Independent Variables: Descriptive Statistics

Variable	Mean	Standard Deviation	Range
SSS Total score	57.62	7.99	42-80
MSES			
Behavior	13.90	2.96	3-20
Cognition	12.31	3.75	2-20
Interoception	10.23	2.58	2-17
Affect	12.62	3.28	4-20
Interpersonal	14.09	3.17	2-20
Mindfulness	11.70	2.87	4-18
Avoidance	13.79	2.85	6-19
Total MAAS	57.13	10.58	29-89
FFMQ			
Observe	25.48	5.21	8-39
Describe	26.90	5.68	12-40
Nonjudge	26.01	5.45	8-40
Nonreact	21.45	3.60	7-31
Act with	24.19	5.12	9-40
Awareness			

Note: SSS = Student Stress Survey; MSES = Mindfulness-Based Self-Efficacy Scale; MAAS = Mindful Attention Awareness Scale; FFMQ = Five Facet Mindfulness Questionnaire

Table 2

Dependent Variables: Descriptive Statistics

Dependent Variable	Mean	Standard Deviation	Range
DASS			
Anxiety	8.26	6.95	0-37
Stress	13.29	8.30	0-41
Total	30.62	21.38	0-111
YBOCS			
Time Spent	2.17	1.67	0-8
Obsession	5.53	3.84	0-18
Compulsion	4.90	4.16	0-18
Total	10.49	7.53	0-33

Note: DASS = Depression, Anxiety, and Stress Scale; Y-BOCS = Yale-Brown Obsessive-Compulsive Scale

consists of 40 items that may be considered potentially stressful situations. The SSS addresses interpersonal, intrapersonal, academic and environmental aspects of stress (Ross, Niebling, & Heckert, 1999). Items on the SSS were either classified as daily hassles or major life events. The SSS contains yes or no items with 1 indicating no and 2 indicating yes. Scores could range from 40 if the student had no stress, to 80 if the student answered yes to every stressful situation. The mean score was 57.6 with a standard deviation of 8.0. The reliability for this study was: $\alpha = .88$. Five participants did not complete the SSS. The range for the remaining 178 participants was 42 to 80.

Mindfulness measures. The Mindfulness-Based Self Efficacy Scale (MSES) consists of 35 items rated on a 0-4 Likert scale ranging from “Not at all” to “Completely” (see Appendix C). The MSES was designed to measure self-efficacy before, during, and after mindfulness-based treatment programs (Cayoun & Freestun, 2004). As this is a cross-sectional, naturalistic study, it was used to illustrate the participants’ levels of mindfulness at the time of completing the survey (see Table 1). The MSES measures the person’s sense of self-effectiveness in areas of behavior, cognition, interoception, affect, interpersonal, avoidance, and mindfulness. A global self-efficacy score can be obtained by summing all seven of these dimensions. In previous work the Chronbach’s alpha coefficient (α) for this scale was .86, indicating good internal consistency (from e-mail correspondence with Cayoun & Freestun, 2/25/08). For this study the global $\alpha = .86$, while the α s for the seven dimensions ranged were: Behavior=.55, Cognition=.76, Interoception=.20, Affect=.62, Interpersonal=.51, Avoidance=.51, and Mindfulness=.47.

The Mindful Attention Awareness Scale (MAAS) is a 15-item instrument that measures one’s receptive awareness of and attention to what is happening in the present moment (see Appendix D). When developing the MAAS (see Table 1), Brown and Ryan (2003) explicitly chose not to assess the “how” and “why” aspects of mindfulness. Rather, they were interested in examining the relation between attention and awareness and variables related to subjective well-being (Block-Lerner, Salters-Pedneault, & Tull, 2005). The MAAS uses a 1-6 Likert scale ranging from “Almost Always” to “Almost Never” and yields a total score. Using a variety of questions about everyday occurrences, participants rated how often they had experiences of acting on automatic pilot, being preoccupied, and not attending to the present moment (Brown & Ryan, 2003). In a previous study, $\alpha = .82$ (Brown & Ryan, 2003). For this study, $\alpha = .84$.

The Five Facet Mindfulness Questionnaire (FFMQ) was developed from factor analysis of five other mindfulness questionnaires given to 613 undergraduate psychology students (Baer, Smith, Hopkins, Krietemeyer, & Toney, 2006). The FFMQ (Appendix E) measures the participant's application of five elements of mindfulness (see Table 1). These 5 elements or facets are: *Observe*, *Describe*, *Act with Awareness*, *Nonreactivity*, and *Nonjudging*. Four of the five factors of the FFMQ were found to be very similar to the factors identified on the Kentucky Inventory of Mindfulness Skills (Baer, Smith, & Allen, 2004) while the fifth factor emerged from items on two of the five other mindfulness questionnaires used in the study (Baer et al., 2006). Reliability estimates for the five facets of the FFMQ obtained from previous work (Baer et al., 2006) were: Nonreactivity, $\alpha=.75$; Observing, $\alpha=.83$; Act with Awareness, $\alpha=.87$; Describing, $\alpha=.91$; and Nonjudging, $\alpha=.87$. For this study the reliability estimates were: Nonreactivity, $\alpha=.71$; Observing, $\alpha=.71$; Act with Awareness, $\alpha=.84$; Describing, $\alpha=.88$; and Nonjudging, $\alpha=.84$, and the global reliability estimate was: $\alpha = .85$. Additionally, the FFMQ has been shown to be correlated in the expected directions with many variables including experiential avoidance, thought suppression, openness to experience, and emotional intelligence predicted to be associated with mindfulness (Baer et al., 2006).

The goal of this exploratory study was to examine both general and specific aspects of mindfulness. The MAAS considers general mindfulness skills. The FFMQ and the MSES each assess specific mindfulness aspects including: Nonreactivity, Observing, Acting with Awareness, Describing, Nonjudging, Behavior, Cognition, Interoception, Avoidance, Interpersonal, Affect, and Mindfulness.

Anxiety measures. The Depression Anxiety Stress Scale (DASS) (Lovibond & Lovibond, 1995) is a 42-item measure and has three subscales (Appendix F). The Anxiety

(DASS_A) and Stress (DASS_S) subscales were used in this study (see Table 2). The Anxiety scale measures autonomic arousal, skeletal musculature effects, situational anxiety, and subjective anxious affect. The Stress scale measures problems with relaxing, nervous arousal, how easily one is upset, irritability, and impatience. The measure is based on a 4-point Likert scale, with 0 being “Did not apply to me at all,” to 3, “Applied to me very much or most of the time.” Lovibond (1998) reported α s for the Anxiety subscale as .84, and the Stress subscale as .90. For this study reliability estimates were: α =.87 for the Anxiety subscale and α =.92 for the Stress subscale.

The Yale-Brown Obsessive Compulsive Scale (Y-BOCS) (Goodman et al., 1989) has two parts with five questions each (see Table 2). The Obsessive Rating Scale measures the effect obsessions have on the person. The Compulsive Rating Scale measures the impact of compulsions on the person. Both subscales range from a score of zero to four, with four indicating that the person has no control over his or her obsessions or compulsions. For this study the reliability estimate for the total Y-BOCS was: α =.93.

Statistical Analysis

For the stated Hypotheses 1-6 Pearson correlation coefficients (r) were computed to determine significant associations among the demographic, confounding, and independent variables with the dependent variables. Only the variables found to be significantly associated at the bivariate level ($p < .05$) were used in subsequent multivariate analyses. The variables used were independent (general and specific mindfulness), dependent (anxiety, obsessive-compulsive symptoms, and stress), confounding (meditation experience, life stressors, participation in psychotherapy [past or present], and use of medication to treat anxiety), and demographic (age, gender, year in school, and ethnicity). Hierarchical regression was used to examine the

predictive relationships between mindfulness-related variables and anxiety-related variables, controlling for demographic variables and historical or confounding variables. As such, three blocks of data were sequentially entered in each hierarchical regression model: 1) demographic, 2) confounding, and 3) mindfulness-related variables. In all but two models, those pertaining to Hypotheses 5 and 6, no demographic variables were observed to be significant at the bivariate level. As such, for the models pertaining to Hypotheses 1-4, only two blocks of data were sequentially entered: 1) confounding and 2) mindfulness-related variables.

Power Analysis

In multiple regression analyses, it is standard practice to have 10-20 participants for each independent variable for adequate power (Keith, 2006). The number of participants for this study (N=183) provided adequate power for the inclusion of the three scales of mindfulness including appropriate subscales thereof (12), and appropriate demographic (4) and historical or confounding (6) variables in the regression analyses. The recommended number of participants was determined a priori using the power analysis program G Power (Faul, Erdfelder, Lang, & Buchner, 2007) in order to have optimum power of .80 and a medium effect size of .15. At the alpha level of .05 at least 131 participants were needed.

CHAPTER 3

Results

Demographic Variables

The participants for this study (N=183) ranged in age from 18 to 62. The mean age was 20.24 ($SD = 5.03$). One hundred thirty-seven of the participants were female (74.9%) and 46 were male (25.1%). There were 100 first-year college students (54.6%), 30 second-year (16.4%), 32 third-year (17.5%), 15 fourth-year (8.2%), and 6 classified as other (3.3 %). The majority of the participants (169) were white (92.3%), whereas 7 participants (3.8%) were African-American, 3 were Asian (1.6%), 3 were Hispanic, and 1 participant marked other. Ethnicity was dichotomized for this study due to the lack of diversity in the sample for this variable (1=White; 2=other).

Confounding Variables

The majority of participants (85.2%) did not have a history of meditation. Meditation was dichotomized for this study due to lack of diversity in this variable for the sample (0=none; 1=any amount). Regarding currently being in psychotherapy, most participants (172; 94%) reported that they were not participating in psychotherapy, while 11 participants (6%) reported that they were. One hundred sixty-one participants (88%) said that they had not had psychotherapy in the past, and 22 (12%) acknowledged having had psychotherapy in the past. For current medications, 170 (92.9%) denied use and 12 (6.6%) acknowledged current use of medications for anxiety. For use of medications in the past, 154 (84.2%) reported no use and 29 (15.8%) acknowledged past use of medications for anxiety. Past and current medications and past and current psychotherapy were all yes or no questions (0=no; 1=yes).

Associations Between Mindfulness and Anxiety-Related Variables

Bivariate and multivariate associations are described below. While all bivariate associations are included in Table 1, a table is also provided for each hypothesis wherein the results of the multivariate analyses are reported: the unstandardized regression coefficients (B), the standard error of B (SEB), the standardized regression coefficients (β), and the variance of each model explained as Total R^2 and R^2 change (ΔR^2) between blocks of data.

Hypothesis 1. Hypothesis 1 considered the relationship between anxiety and specific aspects of mindfulness. Two separate analyses (Hypotheses 1a and 1b) were conducted: one with the MSES as the independent variable and one with the FFMQ as the independent variable.

For Hypothesis 1a control variables included in the analysis at Block 1 were SSS total score, past use of medications, and participants who were currently in psychotherapy for anxiety. Block 2 added the appropriate MSES subscales Behavior, Cognition, Affect, Interpersonal, Mindfulness, and Avoidance. Bivariate correlations between the MSES subscales and the DASS_A scores ranged from -.27 to -.47 (Table 3).

Hypothesis 1a had significant results for six of the seven MSES subscales (Table 4). Block 1 was significant ($F [3, 162] = 9.40$) and explained 15% of the variance in DASS_A scores. The SSS total score was the only significant variable for Block 1. Two MSES subscales in Block 2, Behavior and Cognition were significant ($F [6, 156] = 8.55$) with Cognition having the higher $Beta$ weight. Block 2 explained an additional 21% of the variance of the DASS_A scores. Higher scores on the Behavior subscale were related to lower scores on the DASS_A. Higher scores on the Cognition subscale were related to lower scores on the DASS_A. The entire model accounted for 36% of the variance in DASS_A.

Table 3, Part A

Correlations of DASS and YBOCS Scores with Demographic and Confounding Variables

Variable	DASS_A	DASS_S	YBOCS
Gender	.03	.15+	-.02
Year in College	-.06	-.00	.05
Ethnicity	-.03	-.05	-.08
Age	-.09	-.09	.04
Meditation	.11	.04	-.01
Past medication	.25 ***	.23 **	.11
Current medication	.10	.16 *	.19*
Past psychotherapy	.09	.13	.06
Current Psychotherapy	.25***	.18*	.13
Behavior (MSES)	-.40 ***	-.26 ***	-.34 ***
Cognition (MSES)	-.47 ***	-.54***	-.43 ***
Interoception (MSES)	-.06	-.18*	-.05
Affect (MSES)	-.45***	-.61 ***	-.32 ***
Interpersonal (MSES)	-.40 ***	-.37 ***	-.27***

Note: DASS = Depression, Anxiety, and Stress Scale; Y-BOCS = Yale-Brown Obsessive-Compulsive Scale; MSES = Mindfulness-Based Self-Efficacy Scale; FFMQ = Five Facet Mindfulness Questionnaire; MAAS = Mindful Attention Awareness Scale; SSS = Student Stress Survey

* $p < .05$, ** $p < .01$, *** $p < .001$, + $p = .052$

$N = 170 - 178$

Table 3, Part B

Correlations of DASS and YBOCS Scores with Demographic and Confounding Variables

Variable	DASS_A	DASS_S	YBOCS
Mindfulness (MSES)	-.27***	-.38***	-.27***
Avoidance (MSES)	-.33**	-.30**	-.33**
Observe (FFMQ)	.02	-.01	.12
Describe (FFMQ)	-.22**	-.09	-.09
Nonjudge (FFMQ)	-.38***	-.47 ***	-.35***
Nonreact (FFMQ)	-.20**	-.30***	-.24 **
Act with Awareness (FFMQ)	-.33 ***	-.41 ***	-.30***
MAAS (total)	-.31***	-.34 ***	-.22 **
SSS (total)	.34***	.30 ***	.07
Interpersonal (MSES)	-.40 ***	-.37 ***	-.27***

Note: DASS = Depression, Anxiety, and Stress Scale; Y-BOCS = Yale-Brown Obsessive-Compulsive Scale; MSES = Mindfulness-Based Self-Efficacy Scale; FFMQ = Five Facet Mindfulness Questionnaire; MAAS = Mindful Attention Awareness Scale; SSS = Student Stress Survey

See Limitations of the Present Study section for a brief description/discussion of associations among the IVs.

* $p < .05$, ** $p < .01$, *** $p < .001$

$N = 170 - 178$

Table 4

Hierarchical Regression Analysis Summary for MSES Variables Predicting DASS_A Scores

Variable	<i>B</i>	<i>SEB</i>	β	R^2	ΔR^2
Block 1				.15***	
SSS	.16	.06	.18**		
Past Medications	1.32	1.45	.07		
Current Psychotherapy	1.48	2.33	.05		
Block 2				.36***	.21***
MSES					
Behavior	-.39*	.19	-.16*		
Cognition	-.48**	.18	-.26**		
Affect	-.22	.20	-.10		
Interpersonal	-.34	.20	-.15		
Mindfulness	.30	.21	.12		
Avoidance	-.08	.20	-.03		

Note: SSS = Student Stress Survey; MSES = Mindfulness-Based Self-Efficacy Scale

* $p < .05$, ** $p < .01$, *** $p < .001$

$N = 167$

Hypothesis 1b considered the relation between anxiety and specific subscales of the FFMQ. For Hypothesis 1b control variables included in the analysis at Block 1 were SSS total score, past use of medications, and participants who were currently in psychotherapy for anxiety. In Block 2 the FFMQ subscales that correlated with the DASS_A at the bivariate level were

entered, including Describe, Nonjudge, Nonreact, and Act with Awareness. Results for Hypothesis 1b are found in Table 5. Bivariate correlations between these subscales of the FFMQ and DASS_A scores ranged from -.20 to -.38 (Table 3). Only the SSS total score in Block 1 was significant, with Block 1 explaining 16% of the variance ($F [3, 163] = 10.29$). The significant variables in Block 2 were Describe, Nonjudge, and Act with Awareness. Block 2 explained an additional 19% of the variance ($F [7, 159] = 12.06$). Act with Awareness had the highest *Beta* weight. As such, higher scores in Describe were related to lower scores on the DASS_A. Higher scores in Nonjudge were related to lower scores on the DASS_A. Higher scores in Act with Awareness were related to lower scores on the DASS_A. The entire model accounted for 35% of the variance in DASS_A.

Hypothesis 2. Hypothesis 2 considered the relation between general mindfulness and anxiety. For Hypothesis 2, control variables in the analysis at Block 1 were the SSS total score, past medications, and current psychotherapy. In Block 2 the total score of the MAAS was entered. The bivariate correlation between the MAAS and DASS_A was -.31 (Table 3). Only the SSS total score in Block 1 of Hypothesis 2 was significant ($F [3,170] = 11.01$) with Block 1 explaining 16% of the variance (See Table 6). Block 2 of Hypothesis 2 was also significant and explained an additional 6% of the variance ($F [4,169] = 12.34$), such that higher scores on the MAAS (general mindfulness), were related to lower scores on the DASS_A. The entire model accounted for 23% of the variance in DASS_A.

Hypothesis 3. Hypothesis 3 considered the relation between obsessive compulsive symptoms (Hypotheses 3a and 3b) and specific aspects of mindfulness. The MSES (Hypothesis 3a) and the FFMQ (Hypothesis 3b) measured specific mindfulness. The YBOCS was used to

Table 5

Hierarchical Regression Analysis Summary for FFMQ Variables Predicting DASS_A Scores

Variable	<i>B</i>	<i>SEB</i>	β	R^2	ΔR^2
Block 1				.16***	
Total SSS	.25***	.06	.27***		
Past meds	2.11	1.62	.11		
Current Psychotherapy	4.24	2.47	.12		
Block 2				.35***	.19***
FFMQ					
Describe	-.20*	.08	-.16*		
Nonjudge	-.28**	.09	-.22**		
Nonreact	.07	.14	.04		
Act with Awareness	-.33***	.09	-.25***		

Note: SSS = Student Stress Survey; FFMQ = Five Facet Mindfulness Questionnaire

* $p < .05$, ** $p < .01$, *** $p < .001$

Note: $N = 167$

Table 6

Hierarchical Regression Analysis Summary for the MAAS Predicting DASS_A Scores

Variable	<i>B</i>	<i>SEB</i>	β	R^2	ΔR^2
Block 1				.16***	
Total SSS	.25***	.06	.28***		
Past Meds	1.64	1.48	.08		
Current Psychotherapy	4.44	2.33	.14		
Block 2				.23***	.06***
Total MAAS	-.17***	.05	-.26***		

Note: SSS = Student Stress Survey; MAAS = Mindful Attention Awareness Scale

* $p < .05$, ** $p < .01$, *** $p < .001$

Note: $N = 174$

measure obsessive and compulsive symptoms. For Hypothesis 3a the control variable in the analysis at Block 1, was current medications (See Table 7). Block 2 contained six of the seven subscales of the MSES: Behavior, Cognition, Affect, Interpersonal, Mindfulness, and Avoidance. Block 1 was significant ($F [1,164] = 4.66$) and explained 3% of the variance. Bivariate correlations between the MSES subscales and the YBOCS ranged from -.27 to -.43 (Table 3). The overall regression for Block 2 was significant ($F [6,158] = 7.10$) and explained an additional 21% of the variance. Cognition was the only significant subscale for Block 2. As such, higher scores on the Cognition subscale were related to lower scores on the YBOCS. The entire model accounted for 24% of the variance in the YBOCS.

Table 7

Hierarchical Regression Analysis Summary for MSES Variables Predicting YBOCS Scores

Variable	<i>B</i>	<i>SEB</i>	β	R^2	ΔR^2
Block 1				.03*	
Current Meds	4.76*	2.40	.16*		
Block 2				.24***	.21***
MSES					
Behavior	-.42	.22	-.17		
Cognition	-.62**	.21	-.31**		
Affect	-.03	.22	.01		
Interpersonal	.13	.23	.05		
Mindfulness	.07	.24	.03		
Avoidance	-.41	.23	-.16		

Note: MSES = Mindfulness Based Self-Efficacy Scale

* $p < .05$, ** $p < .01$, *** $p < .001$

Note: $N = 163$

Hypothesis 3b considered the relation between the specific subscales of the FFMQ and the YBOCS, again exploring the relation between mindfulness and obsessive-compulsive symptoms. For Hypothesis 3b the control variable in the analysis at Block 1 was current use of medications. Block 2 added three subscales of the FFMQ Nonjudge, Nonreact, and Act with Awareness. Bivariate correlations between the FFMQ subscales and the YBOCS ranged from -.24 to -.35 (Table 3).

As reflected in Table 8, Block 1 was significant and explained 3% of the variance ($F [1,166] = 5.58$). Block 2 explained an additional 16% of the variance ($F [4,163] = 9.77$). Nonjudge and Act with Awareness were both significant, with Nonjudge having the higher *Beta* weight. Higher scores on the Nonjudge subscale were related to lower scores on the YBOCS.

Higher scores on the Act with Awareness subscale were related to lower scores on the YBOCS. The entire model accounted for 19% of the variance in the YBOCS.

Hypothesis 4. Hypothesis 4 considered the relation between general mindfulness and time spent with obsessions and compulsions. For Hypothesis 4 the control variable included in the analysis at Block 1 was current use of medications. In Block 2 the total score of the MAAS was entered. The bivariate correlation between the MAAS and the YBOCS was $-.22$ (Table 3). The dependent variable for hypothesis 4 was the summation of two items from the YBOCS specifically referring to the amount of time spent with obsessions and compulsions.

As reflected in Table 9, Block 1 of Hypothesis 4 was significant ($F [1, 171] = 6.61$) and explained 4% of the variance of time spent with obsessions and compulsions. The MAAS in Block 2 was also significant ($F [2, 170] = 7.50$) and accounted for 4% of the variance. The entire model accounted for 8% of the variance in time spent with obsessions and compulsions. Higher scores on the MAAS were related to lower scores on amount of time spent with obsessions and compulsions

Hypothesis 5. Hypothesis 5 considered the relation between specific aspects of mindfulness and stress. Two separate analyses (Hypothesis 5a and 5b) were conducted: one with the MSES as the independent variable and one with the FFMQ as the independent variable. Stress was measured by the DASS_S.

Table 8

Hierarchical Regression Analysis Summary for FFMQ Variables Predicting YBOCS Scores

Variable	<i>B</i>	<i>SEB</i>	β	R^2	ΔR^2
Block 1				.03*	
Current	4.10	2.14	.14		
Meds					
Block 2				.19***	.16***
FFMQ					
Nonjudge	-.33**	.10	-.24**		
Nonreact	-.26	.15	-.12		
Act with	-.28**	.11	-.20**		
Awareness					

Note: FFMQ = Five Facet Mindfulness Questionnaire

* $p < .05$, ** $p < .01$, *** $p < .001$ Note: $N = 168$

Table 9

Hierarchical Regression Analysis Summary for the MAAS Predicting YBOCS Scores

Variable	<i>B</i>	<i>SEB</i>	β	R^2	ΔR^2
Block 1				.04*	
Current Meds	5.53	2.17	.19*		
Block 2				.08**	.04**
MAAS	-.15**	.05	-.21**		

Note: MAAS = Mindful Attention Awareness Scale; YBOCS = Yale-Brown Obsessive-Compulsive Scale

* $p < .05$, ** $p < .01$, *** $p < .001$

$N = 170$

Hypotheses 5a and 5b included three blocks of data in the hierarchical regression analyses as the bivariate correlation between gender and DASS_S approached significance ($r=.15$; $p=.052$). For hypothesis 5a the demographic variable gender was entered in Block 1. Control variables in the analysis at Block 2 were SSS total score, past medications, current medications, and current psychotherapy. Block 3 added all seven of the MSES subscales Behavior, Cognition, Interoception, Affect, Interpersonal, Mindfulness, and Avoidance (See Table 10). Bivariate correlations between the MSES subscales and the DASS_S ranged from -.18 to -.61 (Table 3). Block 1 was not significant ($F [1,163] = 2.80$). One variable, SSS total score, was significant in Block 2 ($F [4,159] = 4.81$) with Block 2 accounting for 12% of the variance in the DASS_S. In Block 3 ($F [7,152] = 11.01$) Affect and Cognition were both significant with Affect having the higher *Beta* weight. Block 3 accounted for an additional 29% of the variance. Higher scores on the Cognition subscale were related to lower DASS_S scores. Higher scores on

Table 10

Hierarchical Regression Analysis Summary for MSES Variables Predicting DASS_S Scores

Variable	<i>B</i>	<i>SEB</i>	β	R^2	ΔR^2
Block 1				.02	
Gender	-.13	1.30	-.01		
Block 2				.13***	.12***
Total SSS	.27**	.08	.25**		
Current Psychotherapy	4.41	3.48	.11		
Past Meds	3.21	2.09	1.53		
Current Meds	-1.12	3.36	-.03		
Block 3				.42***	.29***
MSES					
Behavior	.40	.22	.14		
Cognition	-.53*	.20	-.24*		
Interoception	.02	.23	.01		
Affect	-1.04***	.24	-.41***		
Interpersonal	-.22	.23	-.08		
Mindfulness	-.181	.239	-.061		

Note: SSS = Student Stress Survey; MSES = Mindfulness Based Self-Efficacy Scale

* $p < .05$, ** $p < .01$, *** $p < .001$ $N = 166$

the Affect subscale were related to lower DASS_S scores. The entire model accounted for 42% of the variance in DASS_S.

Hypothesis 5b considered the relation between stress and the subscales of the FFMQ. The demographic variable gender was again entered in Block 1. Control variables in the analysis at Block 2 were SSS total score, past medications, current medications, and current psychotherapy. Block 3 added three subscales of the FFMQ, Nonjudge, Nonreact, and Act with Awareness (See Table 11). The bivariate correlations between the significant subscales of the FFMQ and the DASS_S ranged from -.30 to -.47 (Table 3).

Block 1 was not significant ($F [1,165] = 3.02$). Only the SSS total score in Block 2 was significant ($F [5,161] = 4.84$), with Block 2 accounting for 11% of the variance. Nonjudge and Act with Awareness in Block 3 were significant ($F [8,158] = 11.99$), with Nonjudge having the higher *Beta* weight. Block 3 accounted for an additional 25% of the variance. Higher scores on the Nonjudge subscale were related to lower DASS_S scores. Higher scores on the Act with Awareness subscale were related to lower DASS_S score. The entire model accounted for 38% of the variance in DASS_S.

Hypothesis 6. Hypothesis 6 considered the relation between general mindfulness and stress. The demographic variable, gender was entered in Block 1. Control variables in the analysis at Block 2 were SSS total score, current medications, past medications, and current psychotherapy. In Block 3 the MAAS was entered (See Table 12). The bivariate correlation between the MAAS and the DASS_S was -.344 (Table 3).

Block 1 was not significant ($F [1,171] = 3.46$). Only the SSS total score at Block 2 ($F [5,167] = 5.61$) was significant with Block 2 accounting for 14% of the variance for the DASS_S. Block 3 ($F [6,166] = 7.90$) was significant and accounted for an additional 8% of the variance. Higher scores on the MAAS were related to lower scores on the DASS_S score. The entire model accounted for 22% of the variance in DASS_S.

Table 11

Hierarchical Regression Analysis Summary for FFMQ Variables Predicting DASS_S Scores

Variable	<i>B</i>	<i>SEB</i>	β	R^2	ΔR^2
Block 1				.02	
Gender	2.22	1.21	.12		
Block 2				.13**	.11**
Total SSS	.25**	.07	.23**		
Past Meds	1.87	1.77	.08		
Current Meds	-1.12	2.84	-.03		
Current Psychotherapy	2.73	2.93	.08		
Block 3 FFMQ				.38***	.25***
Nonjudge	-.47***	.10	-.31***		
Nonreact	-.14	.16	-.06		
Act with Awareness	-.44***	.11	-.28***		

Note: SSS = Student Stress Survey; FFMQ = Five Facet Mindfulness Questionnaire

$p < .05$, ** $p < .01$, *** $p < .001$ $N = 167$

Table 12

Hierarchical Regression Analysis Summary for MAAS Variables Predicting DASS_S Scores

Variable	<i>B</i>	<i>SEB</i>	β	R^2	ΔR^2
Block 1				.02	
Gender	1.89	1.32	.10		
Block 2				.14***	.12***
Total SSS	.28***	.08	.26***		
Past Meds	1.77	1.95	.08		
Current Meds	-.60	3.14	-.02		
Current	3.98	3.23	.11		
Psychotherapy					
Block 3				.22***	.08***
Total MAAS	-.22***	.06	-.29***		

Note: SSS = Student Stress Survey; MAAS = Mindful Attention Awareness Scale

* $p < .05$, ** $p < .01$, *** $p < .001$ $N = 173$

CHAPTER 4

Discussion

The purpose of this study was to examine the general and specific aspects of mindfulness and how mindfulness may be associated with anxiety, obsessive-compulsiveness, and stress. All six hypotheses were at least partially supported by the results of this study (See Table 13). Hypotheses 1 and 2 indicated that higher levels of mindfulness were related to lower levels of anxiety in general. Hypotheses 3 and 4 supported the hypothesis that higher levels of mindfulness were related to lower levels of obsessive-compulsiveness. The relation between mindfulness and obsessive-compulsiveness was not as strong as the relation between mindfulness and anxiety in general. This is likely due to the low number of participants who reported experiencing obsessive-compulsive symptoms. The use of the YBOCS may also account for the weaker relationship. Hypotheses 5 and 6 examined the relation between mindfulness and symptoms of stress. Higher levels of mindfulness were related to lower levels of stress. The lowest amount of variance explained was found between the MAAS and the YBOCS. The highest amount of variance explained was found between the MSES and the DASS_S.

Hypotheses 1, 3, and 5 each included two parts to examine the relation between specific aspects of mindfulness (using two separate multidimensional measures of mindfulness as the independent variable) and anxiety in general, obsessive-compulsiveness, and stress, respectively. For specific aspects of mindfulness, the subscales or facets that had a significant bivariate correlation with the measures of anxiety, obsessive-compulsiveness, and stress were included in the multivariate analyses. However, these subscales or facets were not always found to have a

Table 13, Part A

Summary of Results

Hypothesis	Results
<p>1. Higher levels of specific mindfulness are associated with lower levels of symptoms of anxiety.</p>	<p>1a. Mindful behavior and mindful cognition are negatively associated with symptoms of anxiety.</p> <p>1b. Describe, Nonjudge, and Act with Awareness are negatively associated with symptoms of anxiety.</p>
<p>2. Higher levels of general mindfulness are associated with lower levels of symptoms of anxiety.</p>	<p>2. General mindfulness is negatively associated with symptoms of anxiety.</p>
<p>3. Higher levels of specific mindfulness are associated with lower levels of obsessive-compulsive symptoms.</p>	<p>3a. Mindful cognition is negatively associated with obsessive-compulsive symptoms.</p> <p>3b. Mindful nonjudgment and mindful acting with awareness are negatively associated with obsessive-compulsive symptoms.</p>

Table 13, Part B

Summary of Results

Hypothesis	Results
4. Higher levels of general mindfulness are associated with less time spent with obsessions and compulsions.	4. General mindfulness is negatively associated with time spent with obsessions and compulsions.
5. Higher levels of specific mindfulness are associated with lower levels of symptoms of stress.	5a. Only mindful cognition and mindful affect are negatively associated with symptoms of stress. 5b. Only mindful nonjudgment and mindful acting with awareness are negatively associated with symptoms of stress.
6. Higher levels of general mindfulness are associated with lower levels of symptoms of stress.	6. General mindfulness was negatively associated with symptoms of stress.

significant association with anxiety, obsessive-compulsiveness, and stress at the multivariate level. The following discussion offers an explanation of the results of this study.

Hypotheses 1 and 2: Mindfulness and Anxiety

Hypothesis 1 considered the relationship between mindfulness, using two separate scales to measure specific aspects of mindfulness and anxiety. Hypothesis 2 considered the relationship between general mindfulness and anxiety. The results for Hypotheses 1a and 1b suggest that Behavior (1a), Cognition (1a), Describe (1b), Nonjudge (1b), and Act with Awareness (1b) are

negatively associated with symptoms of anxiety in general. Likewise, the results for Hypothesis 2 suggests that general mindfulness as measured by the MAAS is also negatively associated with symptoms of anxiety.

Other researchers have examined the relationship between mindfulness and anxiety. Baer et al. (2008), conducted a study regarding associations between mindfulness and anxiety, stress, and depression as well as whether meditation practice leads to higher levels of mindfulness. The study included a meditating group and three nonmeditating groups. Participants completed the FFMQ (Hypothesis 1b of the present study), the DASS-42 (a longer version of the DASS-21), and several other measures. In particular relationships between facets of mindfulness and symptoms of anxiety and stress were found to be negative. For the mindfulness facet of Describing there was a negative relationship with all four groups, but it was not a significant relationship for the meditators group. However, for the mindfulness facet of Observing only the meditating group showed a negative correlation with symptoms of anxiety and stress; in the student sample the correlation was positive. The Observing facet was also positive for the other two nonmeditating samples but was not significant. Baer et al. speculated that this is because meditators learn to observe internal and external stimuli without bias, thus reducing maladaptive forms of selective attention. Very few of the students in the present study had any experience with meditation which may explain why the Observe facet was not found to be significant.

In a study by McKim (2008) 45 participants from three San Francisco Bay Area hospitals with ongoing MBSR groups were recruited. At pretest and posttest, the participants were given the MAAS. Anxiety was measured by the Brief Symptom Inventory-18 (Derogatis, 2001). The participants were trained using Kabat-Zinn's MBSR program. At the end of the 8 weeks there was a large effect size for the negative relation between anxiety and general mindfulness.

In the present study the MAAS accounted for only 6% of the variance in anxiety, suggesting a fairly weak relationship. The strength of this association may have been higher had a mindfulness intervention been included as in the McKim study.

In the present study although there was a negative relationship between general mindfulness and anxiety, when specific aspects were examined only 5 of 12 subscales (7 from the MSES and 5 from the FFMQ) were found to be significant. Describe, Nonjudge, and Act with Awareness were found to have a negative relation with anxiety in general. Participants of mindfulness are taught to describe their thoughts, feelings, and emotions, label them briefly, then return attention to the breath (Baer et al., 2004). The Nonjudge facet is related to Baer's theory that nonjudgmental awareness of anxiety-related feelings without attempting to change, avoid, or escape from these feelings likely will lead to reducing emotional reactions usually brought on by anxiety (Baer, 2003). Act with Awareness supports Brantley's theory of true present-moment awareness (Brantley, 2003). He said that awareness is the key element to changing one's relationship with anxiety. The awareness that is developed through the practice of mindfulness does not try to change the anxious thoughts or feelings. Awareness is what brings about change. Act with Awareness is also related to what mindfulness is truly about according to Kabat-Zinn. He defined mindfulness as awareness that comes from purposefully paying attention to the present moment (Kabat-Zinn, 2003).

Hypotheses 3 and 4: Mindfulness and Obsessive-Compulsiveness

Hypothesis 3 considered the relationship between specific aspects of mindfulness, again using two separate measures and obsessive-compulsiveness. Hypothesis 4 considered the relationship between general mindfulness and time spent with obsessions and compulsions. The results for Hypotheses 3a and 3b suggest that only Cognition (3a), Nonjudge (3b), and Act with

Awareness (3b) are negatively associated with obsessive-compulsive symptoms. The results for Hypothesis 4 suggest that general mindfulness as measured by the MAAS is negatively associated with time spent with obsessions and compulsions as measured by the Y-BOCS. Notably, the results for Hypothesis 4 accounted for the lowest amount of variance of all the hypotheses. This may be due to the low number of participants who acknowledged problems with obsessive-compulsive symptoms. In the present study 20% of the participants reported no time spent with obsessions or compulsions and only 8.7% reported spending more than 4 hours per day on obsessions and compulsions. It is likely that the variance between mindfulness and time spent with obsessions and compulsions would be larger with a more clinical population.

Other research focusing on mindfulness and obsessive-compulsive symptoms include a case study by Firouzabadi and Shareh (2009). Their study considered the effects of mindfulness training on an individual with OCD. At pretreatment the YBOCS score was 36 (out of 40). The individual was given a series of mindfulness-based treatments over a period of time and at the last treatment his YBOCS score had dropped to 12. At follow-up it was 10. The individual was also given the DASS-21 (a 21-item version of the DASS-42) and the Generalized Self-Efficacy scale (GSE) (Schwarzer & Jerusalem, 1995). At the last treatment the DASS total score had decreased and the GSE score had increased.

Similarly, Patel, Carmody, and Simpson (2007) conducted a case study considering the effects of mindfulness on obsessive-compulsiveness. Again, the individual was diagnosed with OCD and at pretreatment scored a 22 on the YBOCS. Included in the study was MBSR education during 8 weeks of treatment. After 8 weeks of treatment the individual's YBOCS score was 13. The individual also demonstrated a significant increase in his ability to achieve a

mindful state as measured by the Toronto Mindfulness Scale (Bishop, Segal, Lau, Anderson et al., 2006).

In another study regarding the effects of mindfulness on obsessive-compulsive symptoms in a student population (Hanstede, Gidron, & Nyklicek, 2008), nine students formed a waiting list control group and eight were in an experimental group that received mindfulness training. The experimental group showed increased levels of mindfulness and specifically letting go of troublesome thoughts and feelings and decreased thought-action fusion. This was associated with a decrease in obsessive-compulsive symptoms.

Taken together these three studies suggest a negative relation between mindfulness and symptoms of anxiety, obsessive-compulsiveness, and stress. In the present study although there was no mindfulness-based treatment, there was a significant negative relation between mindfulness and obsessive-compulsive symptoms. In Hypotheses 3a, 3b, and 4, the variance in obsessive compulsive symptoms accounted for by mindfulness was 21%, 16%, and 4% respectively, providing support at a basic level for the intervention based findings mentioned above (Firouzabadi & Shareh, 2009; Hanstede, Gidron, & Nyklicek, 2008; Patel, Carmody, & Simpson, 2007).

In the present study while higher levels of general mindfulness were associated with lower levels of obsessive-compulsiveness, when specific aspects of mindfulness were examined, only 3 of 12 possible aspects were found to be associated. As such, Cognition, Nonjudge, and Act with Awareness are consistent with and support Schwartz's (1998) method for treating obsessive-compulsiveness through mindfulness. The Cognition subscale is related to Schwartz's ideas regarding relabeling and reattributing in that one acknowledges false messages from the brain and assigns them to a more objective cause rather than the fault of the individual. The

Nonjudge facet is related to Schwartz's concept of revaluing in that one avoids assigning personal blame for the symptoms. Nonjudge is also related to Kabat-Zinn's (1990) ideas regarding a nonjudging stance wherein one simply observes internal stimuli in a neutral manner without negative implications for the self. Act with Awareness also is related to Kabat-Zinn's ideas regarding patience and beginner's mind in that one strives to live in the current moment without being distracted by the past or future and without relying on previous experience to explain current events but remaining open to alternative explanations. Nevertheless, the fact that the current study did not find all aspects of mindfulness to be associated with obsessive-compulsiveness suggests a nuanced relationship and points to the need for clarification through more research.

Hypotheses 5 and 6: Mindfulness and Stress

Hypothesis 5 considered the relationship between specific aspects of mindfulness and stress. Hypothesis 6 considered the relationship between general mindfulness and stress. The results for Hypotheses 5a and 5b suggest that only Cognition (5a), Affect (5a), Nonjudge (5b), and Act with Awareness (5b) are negatively associated with symptoms of stress. Similarly, the results for Hypothesis 6 suggest that general mindfulness as measured by the MAAS is also associated with fewer symptoms of stress.

A number of other studies have observed a negative relationship between mindfulness and stress. Oman, Shapiro, Thoresen, Plant, and Flinders (2008) conducted a study among college students and considered two distinct mindfulness-based meditation-oriented programs: an adaptation of Kabat-Zinn's MBSR and an adaptation of Easwaran's Eight-Point Program (EPP) (Easwaran, 1991). Although there are differences between the programs, both teach similar skills including skills that promote mindful Cognition and mindful Affect. Their findings

supported the primary hypothesis that the practice of mindfulness can reduce levels of perceived stress.

In a noncontrolled study by Carmody and Baer (2008) associations between mindfulness and perceived stress were assessed in 174 adult participants using the FFMQ. The effect of meditation on mindfulness was also assessed. It was found that mindfulness was positively associated with meditation and negatively associated with perceived stress. While not restricted to university students, Carmody and Baer's study indicated a moderate effect size for Acting with Awareness and Nonjudging in relation to lower levels of stress.

In a meta-analysis Chiesa and Serretti (2009) investigated the effects of MBSR on stress. Their results showed, among undergraduate students a significantly higher reduction of stress from pretest to posttest among people receiving the treatment as measured by a global severity index compared to people in wait list control groups (64% versus 14%).

Weinstein, Brown, and Ryan (2009) conducted a short-term longitudinal study involving mindfulness and stress. Undergraduate students were asked to rate on a 5-point Likert scale the stressfulness of their most stressful event of the past month. Based on responses to the MAAS, mindfulness predicted lower perceived stress and the perception of fewer stressors, suggesting mindfulness to have a healthful effect on stress.

Weinstein and colleagues (2009) suggested two primary ways mindfulness may produce positive effects. First, mindfulness may promote a less defensive, more willing stance toward challenging experiences, thereby reducing negative cognitive views of these situations, which in turn may lead to lower levels of perceived stress. Similarly, mindfulness may be related to more adaptive coping in the context of stressful situations. To assess these ideas regarding mindfulness, Weinstein et al. (2009) in a separate study measured the quality of mindfulness of

65 undergraduate students using the MAAS. A stressful situation was presented to the participants after completing the MAAS and several other questionnaires. The MAAS predicted lower perceived stress 5 minutes after the stressful situation was presented and again 30 minutes after the stress induction. The results of that study lend support to their hypotheses by suggesting that mindfulness aids in lessening anxiety through more effective stress regulation.

In a dissertation study by Araas (2008), 2,029 first-year undergraduate students at a large southwestern university completed a variety of questionnaires including the MAAS, KIMS, GSE, and a measure of perceived stress. Results showed that dispositional mindfulness was significantly associated with higher levels of self-efficacy, lower levels of perceived stress, and fewer high risk health behaviors.

In sum, consistent with Araas (2008) the results of the current study provide support for the aforementioned intervention-based studies regarding the seemingly assumed basic relationship between mindfulness and stress. Again, however, in the current study not all aspects of mindfulness were found to be associated with lower levels of stress; only 4 of 12. Nevertheless, according to Greeson and Brantley (2009), mindfulness offers a different approach from simply ignoring inner experience or trying to actively distract attention away from it. Alternatively, mindfulness allows the person to notice and allow anxiety and fear and to respond with openness, curiosity, and acceptance. As such, practicing mindfulness is likely to increase distress tolerance, and promote healthy mind and body functioning (Greeson & Brantley, 2009).

Implications of Findings

While many intervention-based studies have been conducted, fewer studies have been conducted wherein the *basic* association between mindfulness and anxiety has been examined (see Baer et al., 2008). As such, it appears that the basic salutary association between

mindfulness and anxiety is assumed. In the present study while general mindfulness was empirically associated with fewer symptoms of anxiety, obsessive-compulsiveness, and stress, when specific aspects of mindfulness were examined not all aspects were found to be significantly associated. The results of the current study suggest that the salutary association between mindfulness and anxiety is observed mostly in the context of the following specific aspects of mindfulness: Cognition, Affect, Nonjudge, and Act with Awareness.

More research is required before conclusions can be drawn about which specific aspects of mindfulness are most important in the context of anxiety. Nevertheless, to the extent that the results of the current study are accurate and the notion that only certain aspects of mindfulness are associated with anxiety is accurate, it becomes important to focus only on those aspects of mindfulness associated therewith. As such, as basic research regarding which aspects of mindfulness are associated with anxiety becomes clearer, subsequent intervention-based research can be refined, which will lead to more effective and more efficient mindfulness-based treatments for anxiety. For example *Cognition* was most importantly associated with general symptoms of anxiety and obsessive-compulsiveness, whereas *Affect* was most importantly associated with stress. It may be that general symptoms of anxiety and obsessive-compulsiveness are focused in intellectual processes, while symptoms of stress are focused in emotional processes. When designing and implementing mindfulness-based treatments of anxiety, researchers and therapists may be more likely to be effective and helpful if such interventions are tailored toward the outcome-based characteristics of the sample being studied or the needs of the client(s) seeking treatment.

Limitations of the Present Study

The present study had several limitations. These limitations are related to issues of: 1) generalization, 2) measurement, and 3) design.

First, the participants in this study were mainly first-year college students at a regional university in the southeastern United States. Given likely differences based on age, education, and culture, generalization to the wider population is difficult. In the context of culture, people in other regions of the United States may be more likely to have experience with and accept practices or notions otherwise associated with mindfulness. While the southern region of the United States is the most religious region of the country (Newport, 2006), it is also known to practice religion in a unique fashion (Hill, 1999). As such, participants in this study may be reluctant to consider concepts not typically associated with Christianity. Additionally, the sample was one of convenience rather than people known to have symptoms of anxiety and diagnoses of anxiety. While naturalistic observation of symptoms of anxiety, obsessive-compulsiveness, and stress are useful, it is likely that conclusions more applicable to people seeking treatment would be drawn from a sample of people diagnosed with particular anxiety disorders.

Second, measurement limitations involved issues of: reliability, administration, and format. The Observe aspect of mindfulness as measured by the FFMQ may be interpreted differently based on one's experience with meditation or formal understanding of mindfulness. For those with a formal understanding of mindfulness or a history of meditation these items could be interpreted as simply being aware of internal or external stimuli in a nonjudgmental manner. For those without such background, the same items could be viewed as being out-of-touch with one's feelings or even dissociative in nature. Similarly, issues of consistency or

reliability were present in the MSES, one of the measures of specific aspects of mindfulness used in this study, given the low alphas observed in this study. This may be a reason why so few specific aspects of mindfulness were significantly associated. However, those aspects of mindfulness that were significantly associated regardless of the measurement error must be all that much stronger in their association. Nevertheless, the fact that the FFMQ the other measure of specific aspects of mindfulness had good alphas and yet few associations with anxiety strengthens the notion that not all aspects of mindfulness are associated with anxiety.

Issues of administration included the use of the Y-BOCS to determine symptoms of obsessive-compulsiveness in hypothesis 3 and 4. The Y-BOCS is not usually used as a self-report measure but rather as a tool administered in a clinical interview. As such, it likely would have been more appropriate to use a different measure for obsessive-compulsive symptoms for said hypotheses. For example, the short version of the Obsessive-Compulsive Inventory developed by Foa et al. (2002), might be more useful in identifying symptoms of obsessive-compulsiveness on a continuum rather than in effect seeking to verify a diagnostic category.

The SSS used a yes or no response format rather than a Likert-style format, likely limiting the variability in participants' endorsement of recent experiences with stress. There may have been graduated responses to these situations instead of simply yes or no. For example one situation on the SSS is "financial difficulties." This is graded the same as the situation, "death of a family member." A yes response to the stressful situation of financial difficulties most likely carries much less weight than a yes response to a death in the family.

Although the ranges of the dependent variables (DASS and Y-BOCS) were fairly broad, the mean scores appear to be on the low end of the range of scores. As such, skewness may play a role in lack of significant findings and further research may consider more sensitive measures

or dichotomizing the dependent variables and employing appropriate statistical procedures for the analysis of such.

Multicollinearity ($r > .9$; Pallant, 2005) within the MSES subscales and the FFMQ subscales was determined not to be an issue as bivariate correlation coefficients ranged from .09 - .66 and .04 - .36, respectively. However, in further studies it may be useful to center the independent variables to help ensure the prevention of multicollinearity.

Third, design limitations involved issues of cause and effect. While basic research regarding the association between mindfulness and anxiety is useful, the fact remains that the results of this cross-sectional study do not inform the cause and effect or directional nature of these relationships. For example less anxiety may lead to more mindfulness. Intervention and longitudinal research remain the designs required to make such statements.

Conclusions and Future Prospects

The present study supports the overall idea that mindfulness is negatively associated with anxiety, obsessive-compulsiveness, and stress. Kabat-Zinn and colleagues (1992) showed that mindfulness training brings about lower levels of anxiety. The present study did not give instruction and training in mindfulness but rather measured the students' naturalistic levels of mindfulness at the time they completed the study's measurements. Although there are a number of intervention studies available, with more being done, there does not seem to be the availability of basic research to establish a relationship between mindfulness and anxiety. The present study was conducted to add to the basic literature regarding the nature of the associations between mindfulness, anxiety, obsessive-compulsiveness, and stress. A strength of this study, while providing support for the basic relationship between mindfulness and anxiety, is that it also helps pinpoint the particular aspects of mindfulness associated therewith. Similarly, additional

research is required to further refine our understanding of the relationship between mindfulness and anxiety. For example particular mindfulness skills need to be examined before, during, and after interventions to gain a fuller understanding of the relationship between mindfulness and anxiety. With a more precise understanding of the basic relationships, interventions specifically tailored to those aspects empirically connected to anxiety can be developed and studied in an effort to streamline the efficiency of mindfulness as an alternative treatment for anxiety.

Additionally, Toneatto and Nguyen (2007) criticized the study of mindfulness stating that many studies did not use an active control group. As such, future intervention-based research should include well-controlled experiments wherein mindfulness can be effectively compared against other treatments specifically designed to decrease anxiety. It may be that mindfulness is more or less effective than or equal to other such treatments in effectiveness. Unfortunately, the current state of the field does not allow conclusive statements in this regard. The results of this study found that only 6 of the 12 subscales of specific mindfulness were associated with anxiety, obsessive-compulsive symptoms, and stress. Of these six subscales, only four aspects of specific mindfulness are most consistently associated with less anxiety. This information, along with continued examination of specific associations between mindfulness and anxiety will help refine the development of mindfulness-based intervention and enable more accurate comparison between treatments.

In sum, the ancient technique of mindfulness has been used to facilitate healthy functioning in a variety of ways; however, the empirical examination of such is relatively new. While the results of this study suggest a broad and salutary yet nuanced relationship between mindfulness and anxiety, continued research is warranted including basic relationships as well as longitudinal and interventional designs.

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APPENDIX A

Questions Regarding Demographic Information and History

Demographic Information

Age

Gender

Year in School

Ethnicity

Meditation Experience

On a five-point scale, rate your experience with meditation.

0 None

1. A little

2. Moderately

3. A considerable amount

4. A lot

Psychotherapy and Medication

Are you currently in psychotherapy for the treatment of anxiety?

Have you been in psychotherapy in the past for the treatment of anxiety?

Are you currently taking medication for anxiety?

Have you been prescribed medication in the past for anxiety?

APPENDIX B

Student Stress Survey

Place a check beside each source of stress as it applies to you.

Change in social activities

Roommate conflict

Work with people you don't know

Fight with boyfriend/girlfriend

New boyfriend/girlfriend

Change in sleeping habits

Change in eating habits

New responsibilities

Financial difficulties

Held a job

Spoke in public

Change in use of alcohol or drugs

Outstanding personal achievement

Started college

Decline in personal health

Minor law violation

Change in religious beliefs

Death of a family member

Death of a friend

Severe injury

Engagement/marriage

Increased class workload

Lower grade than anticipated

Change of major

Search for graduate school/job

Missed too many classes

Anticipation of graduation

Serious argument with instructor

Vacations/breaks

Waited in long line

Computer problems

Placed in unfamiliar situation

Messy living conditions

Put on hold for extended period of time

Change in living environment

Car trouble

Quit job

Divorce between parents

APPENDIX C

Mindfulness-Based Self Efficacy Scale (MSES)

Circle one number in the column according to how much you now agree or disagree with each statement below, using the following scale:

Not at all	A little	Moderately	A lot	Completely
0	1	2	3	4

Try not to spend too much time on any one item. There are no right or wrong answers.

MSES

1. I am able to think about what I am about to do before I act.
2. When an unpleasant thought enters my mind, I can cope with it.
3. When I relax, I can feel sensations in my body.
4. I get easily overwhelmed by my emotions.
5. I find it difficult to make new friends.
6. I try to avoid uncomfortable situations even when they are important.
7. I am aware when I am about to do something that could hurt me or someone else.
8. Stopping myself from engaging in unwanted or hurtful behaviors is very difficult.
9. I know that my thoughts don't have the power to hurt me.
10. When I am stressed, I am aware of unpleasant body sensations.
11. When I feel very emotional, it takes a long time for it to pass.
12. It is ok for me to feel strong emotions.
13. I feel comfortable saying sorry when I feel I am in the wrong.
14. It is often too late when I realize I overreacted in a stressful situation.
15. If something needs to be done, I am able to complete it within a reasonable time.
16. I get so caught up in my thoughts that I end up feeling very sad or anxious.
17. When I have unpleasant feelings in my body, I prefer to push them away.

18. I believe that I can make my life peaceful.
19. I can resolve problems easily with my partner (or best friend if single).
20. I can face my thoughts, even if they are unpleasant.
21. I am tolerant with myself when I am repeating old habits that are no longer helpful.
22. My actions are often controlled by other people or circumstances.
23. I get caught up in unpleasant memories or anxious thoughts about the future.
24. I can deal with physical discomfort.
25. I feel I cannot love anyone.
26. I am often in conflict with one (or more) family member.
27. I avoid feeling my body when there is pain or other discomfort.
28. I find it difficult to accept unpleasant experiences
29. I do things that make me feel good straightaway even if I will feel bad later.
30. When I have a problem, I tend to believe it will ruin my whole life.
31. When I feel physical discomfort, I relax because I know it will pass.
32. Even when things are difficult I can feel happy.
33. I can feel comfortable around people.
34. Seeing or hearing someone with strong emotions is unbearable to me.
35. If I get angry or anxious, it is generally because of others.

APPENDIX D

Mindful Attention Awareness Scale (MAAS)

Instructions: Below is a collection of statements about your everyday experience. Using the 1-6 scale, please indicate how frequently or infrequently you currently have each experience. Please answer according to what *really reflects* your experience rather than what you think your experience should be. Please treat each item separately from every other item.

1	2	3	4	5	6
Almost Always	Very Frequently	Somewhat Frequently	Somewhat Infrequently	Very Infrequently	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 physical tension or 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 being really attentive to them.

9. I get so focused on the goal I want to achieve that I lose touch with what I'm doing right now to get there.
10. I do jobs or tasks automatically, without being aware of what I'm 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'm eating.

APPENDIX E

Five-Facet Mindfulness Questionnaire (FFMQ)

Please rate each of the following statements using the scale provided. Write the number in the blank that best describes your own opinion of what is generally true for you.

1	2	3	4	5
Never or very rarely true	Rarely true	Sometimes true	Often true	Very often or always true

FFMQ

1. When I'm walking, I deliberately notice sensations of my body moving.
2. I'm good at finding words to describe my feelings.
3. I criticize myself for having irrational or inappropriate emotions.
4. I perceive my feelings and emotions without having to react to them.
5. When I do things, my mind wanders off and I'm easily distracted.
6. When I take a shower or bath, I stay alert to sensations of water on my body.
7. I can easily put my beliefs, opinions, and expectations into words.
8. I don't pay attention to what I'm doing because I'm daydreaming, worrying, or otherwise distracted.
9. I watch my feelings without getting lost in them.
10. I tell myself I shouldn't be feeling the way I'm feeling.
11. I notice how foods and drinks affect my thoughts, bodily sensations, and emotions.
12. It's hard for me to find the words to describe what I'm thinking.
13. I am easily distracted.

14. I believe some of my thoughts are abnormal or bad and I shouldn't think that way.
15. I pay attention to sensations, such as the wind in my hair or sun on my face.
16. I have trouble thinking of the right words to express how I feel about things.
17. I make judgments about whether my thoughts are good or bad.
18. I find it difficult to stay focused on what's happening in the present.
19. When I have distressing thoughts or images, I "step back" and am aware of the thought or image without getting taken over by it.
20. I pay attention to sounds, such as clocks ticking, birds chirping, or cars passing.
21. In difficult situations, I can pause without immediately reacting.
22. When I have a sensation in my body, it is difficult for me to describe it because I can't find the right words.
23. It seems I am "running on automatic" without much awareness of what I'm doing.
24. When I have distressing thoughts or images, I feel calm soon after.
25. I tell myself that I shouldn't be thinking the way I'm thinking.
26. I notice smells and aromas of things.
27. Even when I'm feeling terribly upset, I can find a way to put it into words.
28. I rush through activities without being really attentive to them.
29. When I have distressing thoughts or images, I am able just to notice them without reacting.
30. I think some of my emotions are bad or inappropriate and I shouldn't feel them.
31. I notice visual elements in art or nature, such as colors, shapes, textures, or patterns of light and shadow.
32. My natural tendency is to put my experiences into words.

33. When I have distressing thoughts or images, I just notice them and let them go.
34. I do jobs or tasks automatically without being aware of what I'm doing.
35. When I have distressing thoughts or images, I judge myself as good or bad, depending on what the thought/image is about.
36. I pay attention to how my emotions affect my thoughts and behavior.
37. I can usually describe how I feel at the moment in considerable detail.
38. I find myself doing things without paying attention.
39. I disapprove of myself when I have irrational ideas.

APPENDIX F

Depression Anxiety Stress Scale (DASS)

Please read each statement and choose a number 0, 1, 2, or 3 that indicates how much the statement applied to you *over the past week*. There are no right or wrong answers. Do not spend too much time on any statement.

The rating scale is as follows:

0 Did not apply to me at all

1 Applied to me to some degree, or some of the time

2 Applied to me a considerable degree, or a good part of the time

3 Applied to me very much, or most of the time

1. I was aware of dryness of my mouth

2. I couldn't seem to experience any positive feeling at all

3. I experienced breathing difficulty (e.g., excessively rapid breathing, breathlessness in the absence of physical exertion)

4. I just couldn't seem to get going.

5. I tended to over-react to situations

6. I had a feeling of shakiness

7. I found it difficult to relax

8. I found myself getting upset by quite trivial things

9. I found myself in situations that made me so anxious I was almost relieved when they ended

10. I feel I have nothing to look forward to

11. I found myself getting upset rather easily
12. I felt that I was using a lot of nervous energy
13. I felt sad and depressed
14. I found myself getting impatient when I was delayed in any way
15. I had a feeling of faintness
16. I felt that I had lost interest in just about everything
17. I felt I wasn't worth much as a person
18. I felt that I was rather touchy
19. I perspired noticeably in the absence of high temperatures or physical exertion
20. I felt scared without good reason
21. I felt that life wasn't worthwhile
22. I found it hard to wind down
23. I had difficulty swallowing
24. I couldn't seem to get any enjoyment out of the things I did
25. I was aware of the action of my heart in the absence of physical exertion
26. I felt down-hearted and blue
27. I found that I was very irritable
28. I felt I was close to panic
29. I found it hard to calm down after something upset me
30. I feared that I would be "thrown" by some trivial but unfamiliar task
31. I was unable to become enthusiastic about anything
32. I found it difficult to tolerate interruptions to what I was doing
33. I was in a state of nervous tension

- 34. I felt I was pretty worthless
- 35. I was intolerant of anything that kept me from getting on with what I was doing
- 36. I felt terrified
- 37. I could see nothing in the future to be hopeful about
- 38. I felt that life was meaningless
- 39. I found myself getting agitated
- 40. I was worried about situations in which I might panic and make a fool of myself
- 41. I experienced trembling (e.g., in the hands)
- 42. I found it difficult to work up the initiative to do things

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