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An Intervention Study on Mindfulness Meditation and Mindfulness, Stress, Flourishing, and Academic Achievement in a First-Year Experience Seminar

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AN INTERVENTION STUDY ON MINDFULNESS MEDITATION AND MINDFULNESS, STRESS, FLOURISHING, AND ACADEMIC ACHIEVEMENT IN A FIRST-YEAR EXPERIENCE SEMINAR

A dissertation submitted in partial requirements for the degree of Doctor of Philosophy in Education with a Concentration in Counselor Education and Supervision at Virginia Commonwealth University

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I understand now why they have to play music at award shows to get people off of the stage. To anyone I did not mention in here, please know that I am grateful for you and your encouragement.

TABLE OF CONTENTS

LIST OF TABLES

ABSTRACT

AN INTERVENTION STUDY ON MINDFULNESS MEDITATION AND MINDFULNESS, STRESS, FLOURISHING, AND ACADEMIC ACHIEVEMENT IN A FIRST-YEAR EXPERIENCE SEMINAR

By Elizabeth S. Bambacus

A dissertation submitted in partial fulfillment of the requirements for the degree of Doctor of Philosophy at Virginia Commonwealth University

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This study investigated the two research questions, 1) what are the relationships among the pretest latent variables mindfulness, stress, and flourishing and the manifest variables GPA and retention in first-year college students in a first-year experience seminar and 2) will there be differences in mindfulness, stress, flourishing, GPA, and retention between groups of students in a first-year experience seminar who received a brief mindfulness intervention and those who did not? To answer these questions, the author analyzed secondary data collected from 373 first-year college students at a large public research university who took Introduction to the University (UNIV 101).

The study was a repeated-measures quasi-experimental nonequivalent control groups design. Eighteen instructors across 35 class sections volunteered to provide the intervention in their class, 248 first-year students (66%) made up the mindfulness group, and 125 first-year

xiii

students (35%) made up the comparison group. Women made up 70% (n = 261) of the sample and males made up 30% (n = 112). Pretests and posttests included demographics, the Mindful Attention Awareness Scale (MAAS), the Perceived Stress Scale (PSS), the Flourishing Scale (FS), and questions asking about prior mindfulness experience (pretest) and current and potential future practices (posttest). Chi-squared tests and *t*-tests evaluated variances between groups in demographics and outcome variables. Only gender varied significantly.

Bivariate Pearson's correlations of the latent variables showed 1) a significant positive relationship between mindfulness and flourishing and 2) significant negative relationships between stress and both mindfulness and flourishing. Simple regression analyses for the pretest latent variables with GPA showed a significant positive predictive relationship only between pretest flourishing and Spring GPA. The same tests run with the posttest latent variables showed 1) significant positive predictive relationships between GPA and both mindfulness and flourishing and 2) significant negative predictive relationships between stress and GPA. Only posttest flourishing positively predicted retention. For question two, a multilevel model controlling for class sections and gender showed no significant differences in any outcome variable between either group. A post hoc analysis showed that all students had significant decreases in mindfulness and flourishing at the end of the semester and a significant increase in stress.

Chapter One

Introduction

Although mindfulness is currently trending in the western world, it has existed for more than 2,500 years in Buddhist dharma (i.e., natural law or teachings; Kabat-Zinn, 2003). Today, mindfulness is most commonly defined as "paying attention on purpose, in the present moment, and nonjudgmentally" (Kabat-Zinn, 2003, p. 145). This idea of being aware without reacting to negative thoughts or feelings is prevalent in Buddhist dharma (Brown, Creswell, & Ryan, 2015), and this focus on non-reactivity was in response to the dharma that suffering is a universal experience (Maex, 2011). Meditation was formed out of a desire to shift from suffering to well-being (Ludwig & Kabat-Zinn, 2008; Maex, 2011), with mindfulness created as a form of meditation.

Mindfulness practice today is used to reduce suffering and to increase well-being, and it has been studied in areas such as medical fields (Gallego, Aguilar-Parra, Cangas, Langer & Mañas, 2014; Horesh, Glick, Taub, Agmon-Levin, & Shoenfeld, 2017; Kabat-Zinn, 1982; Serpa, Taylor, & Tillisch, 2014) and business fields (Dane & Brummel, 2014; Hülsheger, Alberts, Feinholdt, & Lang, 2013; King & Haar, 2017; Leroy, Anseel, Dimitrova, & Sels, 2013; Ruedy & Schweitzer, 2010). Of importance to the current study is its use in counseling and education fields. In counseling, mindfulness has been shown to reduce depressive symptoms and improve psychological well-being (Fjorback, Arendt, Ørnbøl, Fink, & Walach, 2011). In education, mindfulness has been shown to improve attention in elementary school students (Napoli, Krech,

& Holley, 2005), academic performance in middle school students (López-González, Amutio, Oriol, & Bisquerra, 2016), and emotion regulation and coping with stress in high school students (Luiselli, Worthen, Carbonell, & Queen, 2017). The focus of the current study is on mindfulness and college students.

Theoretical Framework

According to Kabat-Zinn (2013), mindfulness is intentionally paying attention to the present moment without placing judgment on the thoughts and feelings that enter the mind. In paying attention, one utilizes awareness and consciousness, and in paying attention on purpose, one is aware of the awareness. The mechanisms of mindfulness, therefore, are attention, consciousness, awareness, and metacognitive awareness (Brown & Ryan, 2003). Other mechanisms that experts consider include emotion regulation, self-perspective, intention, and attitude to attention (Holzel et al., 2011; Shapiro, Carlson, Astin, and Freedman, 2006). Despite these various perspectives, one of the most common mechanisms that researchers hold to is attention—a term that defines mindfulness.

Though similar, awareness, attention, and consciousness are three distinct constructs. Consciousness is the alertness to present experiences and requires both awareness of and attention to those experiences. Awareness is the processing of internal and external environments in search of those experiences. Attention is the focus paid to those experiences (Brown & Ryan, 2003). Individuals with high levels of mindfulness are conscious of, aware of, and pay attention to present-moment stimuli, which includes their internal thoughts and feelings. Metacognitive awareness is the next step of awareness where the person notices that these processes are happening in their mind (Schooler et al., 2011).

Mindfulness breaks the cycle of unconscious thought processes, which are closely associated with negative affect, including anxiety and depression (Hollon & Kendall, 1980; Riley, Lee, & Safren, 2017; McNally, 1995). The oblivious mind is susceptible to mind wandering and rumination, and it gets swept away by automatic thoughts and self-focused attention (Muraven, 2005; Risko, Anderson, Sarwal, Engelhardt, & Kingston, 2012). Noticing the present moment and becoming aware of unconscious cognitive processes leads to emotion regulation and self-regulation. Individuals who practice mindfulness have greater emotion regulation and self-regulation, making them less susceptible to the rumination of mind wandering, automatic thoughts, and self-focused attention (Baer, 2009; Berking et al., 2008; Chambers, Gullone, & Allen, 2009; McNally, 1995; Posner & Rothbart, 2000; Shapiro, 1984; Zimmerman, 2002).

Mindfulness in College

Mindfulness research with college students abounds. Three relevant areas of research to the current study include stress, flourishing, and academic achievement. For example, mindfulness has been shown to decrease anxiety and depression (Bamber & Kraenzle Schneider, 2016; Cole et al., 2015), improve first-year college adjustment (Dvořáková et al., 2017), and improve loneliness and academic achievement (Rosenstreich & Margalit, 2015). These examples illustrate that although the concept of mindfulness began centuries ago as an eastern spiritual practice, it is thriving today and targeting specific populations and types of suffering.

The relationship between mindfulness and stress in college students has been well studied. Stress is a physiological response to a stressor, (Everly & Sobelman, 1987), and the responses are generally similar despite the nature of the stressor; therefore, an individual could respond to a physical stimulus and a psychological stimulus (e.g., a thought) in the same way

(Sapolsky, 2004; Cohen, Kessler, & Gordon, 1995). The appraisal of the stimulus is the required additional step between the stimulus and the response, because it determines the response (Ellis, 1987; Everly & Sobelman, 1987). For example, if a college professor reminds the class of an upcoming exam, one student may believe he is prepared and not experience a stress response, while another student may doubt his readiness, believe he might fail, and then experience emotional and physiological stress response symptoms. Mindfulness has been shown to reduce these negative automatic thought processes along with stress levels (Baer, 2009; Brown, Marquis, & Giuffrida, 2013).

Mindfulness has also been studied in relation to flourishing. The concept of flourishing is often mistakenly equated to happiness (Haybron, 2008). While happiness is often used colloquially to describe well-being, it does not encompass the full meaning of the construct. Well-being theory is divided into two subsets: hedonic, which includes the elusive feeling of happiness, and eudaimonic, which includes the more stable feeling of fulfilment (Keyes, Shmotkin, & Riff, 2002). Hedonic well-being includes the day-to-day feelings that are susceptible to situational circumstances, while eudaimonic well-being is considered to be authentic happiness or how well the person is functioning; therefore, eudaimonic well-being is also referred to as psychological well-being (Easterlin, 2001). While flourishing considers the hedonic components of life circumstances like support from friends and family, life events, and the presence or lack of physical ailments, it is deeper. Flourishing is about having self-acceptance, purpose in life, and other self-growth characteristics that are positively self-focused (Ryff, 1989). Mindfulness has been shown to improve flourishing levels (Feicht et al., 2013)

Mindfulness has also been correlated with academic achievement. Academic achievement is most often defined in terms of grade point average (GPA) and retention, and it is

highly sensitive to college students' emotional and environmental circumstances (Bishop, 2016; Hartley, 2010). GPA and retention are strongly correlated, so when a student's GPA is negatively impacted, their chances of dropping out increase (Zajacova, Lynch, & Espenshade, 2005). For example, stress has been shown to impact both GPA and retention (Zajacova et al., 2005), and students with the high stress of financial burdens are more likely to drop out (Webster & Showers, 2011). There are few studies that look at the effect of mindfulness on academic achievement, particularly on retention, but those that do study the effects show positive impacts. For example, mindfulness meditation has been shown to improve cumulative GPA (Hall, 1999), metacognition and attention (Bergen-Cico, Possemato, & Cheon, 2013), and academic performance (Hanley, Palejwala, Hanley, Canto, & Garland, 2015).

Statement of the Problem

Adjusting to college is an extremely stressful time for many students, and, for traditional students, occurs during the age when they are more likely to develop a psychological disorder (Kessler et al., 2005). Students have to adjust socially, environmentally, and academically, with often drastic changes in social support, living situations, and academic responsibilities (Leppink, Odlaug, Lust, Christenson, & Grant, 2016). More than half of all college students in 2015 reported experiencing overwhelming anxiety within the past year (ACHA, 2014). Because rumination and stress predict occurrences of anxiety and depression (Akgun & Ciarrochi, 2003; Morrison & O'Connor, 2005; Veena & Shastri, 2016), it may be helpful to teach students techniques evidenced to calm their mind and improve their well-being, which could help them improve academically and stay in school.

Retention is a major concern for college and university administrators, because when students leave, so do their tuition dollars. Valuable resources and funds must be used to replace

the students who left. Further, low retention numbers do not market well to prospective students (Jamelske, 2006; Porter & Swing, 2006). Retention theory points to satisfaction with the school, the matching of school and student values, and preparedness for college as the strongest predictors of staying in college (Bean, 1985; Bishop, 2016; Tinto, 1975). Administrators, therefore, turn to theory and application research to keep students engaged and at their school. Chances of dropout are greatly increased when stress becomes more than students can handle and impacts their well-being (Sohail, 2013).

College administrators attempt various programs and initiatives to engage and connect students to the university; however, students are still succumbing to stress and either leaving or suffering academically. Programs that teach mindfulness empower students to be present and to detach from their thoughts; however, these programs are not as common as learning communities and first-year experience courses, which do not address the root issue, wich, according to Ellis (1987), is the appraisal of thoughts. As previously stated, the research shows that 1) mindfulness practice reduces stress and improves psychological well-being, 2) psychological well-being—or flourishing—is positively correlated with GPA, 3) GPA is highly correlated with retention, and 4) flourishing is positively correlated with GPA and retention. There is even evidence that mindfulness and GPA are correlated, so it is imperative that administrators begin using mindfulness as a retention tool.

Administrators are not looking to mindfulness to improve retention, and this could be because there are no empirical studies that specifically look at the relationship between mindfulness and retention. There are studies that look at the relationships between retention and constructs that mindfulness has been shown to impact, like stress and flourishing, but no study has looked at a mindfulness intervention with a specific focus on retention. In fact, mindfulness

6

and academic achievement is a neglected area of study in general. Those who have investigated mindfulness and academic achievement found that mindfulness improved academic achievement in terms of GPA. While GPA and retention have been shown on their own to be closely connected to each other, and mindfulness and GPA have been shown to correlate, there needs to be a focus on the relationship between mindfulness and retention.

Purpose

The purpose of the present study is to investigate the relationships among a mindfulness intervention with first-year college students and their levels of mindfulness, stress, flourishing, and academic achievement in terms of GPA and retention. College students need tools that can help them not only reduce their stress but also increase their psychological well-being and chances of staying in school and graduating.

Mindfulness meditation practice halts ruminative thinking associated with automatic thoughts, self-focused attention, and mind wandering (Kiken & Shook, 2014; McNally, 1995; Posner & Rothbart, 2000). These thought processes are associated with negative affect, including depression and anxiety (Morrison & O'Connor, 2005), so it is hoped that introducing a mindfulness practice will support previous literature showing it decreases negative affect and increases positive affect (Taylor, Strauss, Cavanagh, & Jones, 2014). In addition to no longer worrying about the past or future, bringing attention to the present moment has also been shown to improve emotion regulation and self-regulation (Kabat-Zinn, Lipworth, Burney, & Sellers, 1987; Shapiro & Schwartz, 1999; Vago & Silbersweig, 2012), which research show impacts on mood (Muraven, 2005) and academic achievement (Waters, Barsky, Ridd, & Allen, 2014; Zimmerman, 2002). It is hoped, therefore, that the mindfulness meditation will have a significant relationship with academic achievement.

Research Questions

Based on the previous literature and the focus of the current study, the research questions and their respective hypotheses for this study were as follow:

R_1: What are the relationships among the pretest latent variables mindfulness, stress, and flourishing and the manifest variables GPA and retention in first-year college students in a first-year experience seminar?

H_{1a}: As pretest mindfulness levels increase, pretest flourishing levels will increase and pretest stress levels will decrease.

H_{1b}: GPA will increase as pretest mindfulness and flourishing increase, and GPA will decrease as pretest stress increases.

H_{1c}: As GPA increases, retention odds will increase.

H_{1d}: Retention odds will increase as pretest mindfulness and flourishing increase, and retention odds will decrease as pretest stress increases.

R_2: Will there be differences in mindfulness, stress, flourishing, GPA, and retention between groups of students in a first-year experience seminar who received a brief mindfulness intervention and groups of students who were also in a first-year seminar but who did not receive the intervention?

H_{2a}: There will be significant increases in mindfulness and flourishing in the group of students in a first-year experience seminar who received a brief mindfulness intervention and not in the group of students in a first-year experience seminar who did not receive the intervention.

H_{2b}: There will be a significant decrease in stress in the group of students in a first-year experience seminar who received a brief mindfulness intervention and

not in the group of students in a first-year experience seminar who did not receive the intervention.

H_{2c}: There will be significantly higher GPAs in the group of students in a first-year experience seminar who received a brief mindfulness intervention and not in the group of students in a first-year experience seminar who did not receive the intervention.

H_{2d}: There will be significantly higher retention in the group of students in a first-year experience seminar who received a brief mindfulness intervention and not in the group of students in a first-year experience seminar who did not receive the intervention.

Research Approach

This study will be a repeated-measures quasi-experimental nonequivalent control group design using secondary data from a previously conducted mindfulness intervention study. The previous study was simply the intervention and the collection of data. Results from the original study were neither deeply analyzed nor reported, and reference to the "current study" is the analysis of the data for the purpose of this dissertation. The repeated measures were pretests and posttests collected before and after the intervention, and the groups were the Introduction to the University (UNIV 101) classes that received the intervention and those that did not. Because there was no random assignment, the groups were not equal; therefore, the groups were considered nonequivalent even though the group not receiving the intervention was used as the control group (Goodwin, 1998). The author of the current study explored the relationships among mindfulness, stress, flourishing, GPA, and retention, and then she investigated the

differences between the intervention and comparison groups in levels of mindfulness, stress, GPA, and retention. Proposed statistical analyses are presented in chapter three.

Definition of Terms

The following terms are integral to the current study and are referenced throughout this dissertation. Each is briefly defined here but explained more thoroughly in their respective sections in chapter two.

Mindfulness: The contemporary definition of mindfulness is "paying attention on purpose, in the present moment, and nonjudgmentally" (Kabat-Zinn, 2003, p. 145). It is about noticing thoughts and emotions as they enter the mind, but letting them pass through without reacting emotionally or physically (Kabat-Zinn, 2003).

Stress: Stress is "a process in which environmental demands tax or exceed the adaptive capacity of an organism, resulting in psychological and biological changes that may place persons at risk for disease" (Cohen, Kessler, & Gordon, 1995, p. 3). The stress response is a physiological response to a stimulus that is known as the stressor (Everly & Sobelman, 1987).

Flourishing: Flourishing is made up of the two well-being constructs: hedonic well-being and eudaimonic well-being. Hedonic well-being is the day-to-day level of happiness that is subjective and sensitive to life circumstances, whereas eudaimonic well-being is about how self-fulfilled a person feels. Flourishing is often considered more eudaimonic because it is less sensitive to life circumstances and encompasses how much a person is fully functioning (Diener et al., 2010; Ryan & Deci, 2001) and authentically happy, or, fulfilled (Haybron, 2008).

Academic Achievement: Academic achievement is defined here as staying in school (retention) and getting high enough grades to pass classes and be in good academic standing. These two benchmarks are predictors of graduation (Whalen, Saunders, & Shelley, 2010).

Grade Point Average: Grade point average (GPA) is calculated on a four-point scale, where an A grade equals four points and an F equals zero.

Retention: Retention is the term institutions of higher education use to refer to keeping students in school instead of them dropping out or transferring. In the current study, retention refers to the participants' enrollment into the fall semester of their second year of college, meaning that they were retained after their first year.

Chapter Two

Review of the Literature

Chapter two provides a review of the literature to show that there is a need for more research on the relationship between mindfulness meditations and academic achievement in college students. In doing so, this literature review will cover research on mindfulness, academic achievement, stress, and flourishing. The mindfulness section will begin with an exploration of its history, an operational definition, and a theoretical framework. Then various applications of mindfulness will be considered before reviewing the use of mindfulness in the fields of education and counseling, which are both relevant to the current study. Dosages of mindfulness practice in training programs will also be discussed. The next section will be on academic achievement, its operational definitions, and its relationship to mindfulness. The focus of academic achievement will be in higher education, and literature on the relationship between mindfulness and academic achievement will be explored. The next section will be on stress and will include a brief description and operational definition, followed by a discussion on the relationships among stress, mindfulness, and academic achievement. The section after stress will be about flourishing, which will include a description of how it fits into the construct of well-being. There will be an operational definition of flourishing as well as discussion of the relationships among flourishing, mindfulness, academic achievement, and stress. Finally, this chapter will conclude with a review of the literature that covers all of these constructs: mindfulness, academic achievement, stress, and flourishing. The conclusion will include the goal of the present research, which is to provide

an intervention that will help college students decrease stress and improve their mindfulness, flourishing levels, and academic achievement.

Mindfulness

Mindfulness has been a growing trend in recent years, particularly in the university setting (Ramler, Tennison, Lynch, & Murphy, 2016), but it has actually been in existence for more than 2,500 years as a Buddhist meditation (Vago & Silbersweig, 2012). Broadly, meditation is a process of obtaining a different state of consciousness, specifically one that narrows attention, slows metabolism, and increases relaxation (Hall, 1999, p. 408). It is a type of "mental training," and many variations exist (Rojiani, Santoyo, Rahrig, Roth, & Britton, 2017, p. 1). Variations of meditation include Transcendental Meditation, guided visualization, Qi Gong, and mindfulness.

Mindfulness meditation originated from Buddhist dharma (i.e., a teaching or a law as in a law of physics), and it is one of many virtues and qualities in Buddhism. For example, it is one of the five basic faculties (i.e., faith, vigor, mindfulness, concentration, and wisdom) and one of the seven factors of awakening (i.e., investigation of dharma, mindfulness, vigor, joy, tranquility, concentration, and equanimity; Brown, Creswell, & Ryan, 2015). The word *dharma* does not have a direct English translation, but is mostly closely described as natural law and the teachings of Buddha (Kabat-Zinn, 2003). Kabat-Zinn (2003) explains dharma as being a universal and "coherent phenomenological description of the nature of mind, emotion, and suffering and its potential release, based on highly refined practices aimed at systematically training and cultivating various aspects of mind and heart via the faculty of mindful attention" (p. 145). This concept of suffering is key to Buddhism and mindfulness.

13

Suffering is center to Buddhist dharma as is evident in the four noble truths. In order, they are 1) the observation that suffering exists, 2) suffering's origin, 3) ending suffering by ending its origin, and 4) taking the path that leads to the end of suffering (the eightfold path; Maex, 2011). Simply put, "the Dharma is about suffering and nothing else" (Maex, 2011, p. 168), and the Buddha teaches that humans should accept practices that lead to wellbeing and reject practices that lead to suffering (Maex, 2011). Meditation was derived to help humans move from suffering to an experience of wellbeing and compassion (Ludwig & Kabat-Zinn, 2008; Maex, 2011).

The concept of suffering was purposefully kept vague so that it would encompass all types of suffering (Maex, 2011); therefore, many contemporary fields have been able to adopt its meditation practices. Until roughly 30 years ago, mindfulness meditation was mostly practiced by those who followed Buddhism; however, because of the similar purposes it has with western medicine, such as to reduce suffering and improve emotions and quality of life, it has gained traction in secular areas (Vago & Silbersweig, 2012). Areas such as medicine, business, education, and counseling will be discussed later.

There are a variety of contemporary definitions of mindfulness throughout the literature, though the one most widely used was introduced to the field of medicine in 1979 by Kabat-Zinn (2003). He defined it 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). This definition means that as thoughts and feelings occur, they are experienced and then allowed to pass without attachment. Experiencing means "focusing attention on the experience of thoughts, emotions, and body sensations … and simply observing them" without attaching meaning (Hölzel et al., 2011, p. 538). Kabat-Zinn's (2003) definition of

14

mindfulness is often the primary one referenced (Messer, Horan, Turner, & Weber, 2016), but

mindfulness is still operationally defined in multiple ways, including

> (1) A temporary state of non-judgmental, non-reactive, present-centered attention and
>
> awareness that is cultivated during meditation practice; (2) An enduring trait that can be
>
> described as a dispositional pattern of cognition, emotion, or behavioral tendency; (3) A
>
> meditation practice; [and] (4) An intervention. (Vago & Silbersweig, 2012, p. 1)

Though there are a variety of mindfulness definitions, (Harrington & Dunne, 2015;

Shapiro, Oman, Thoresen, Plante, & Flinders, 2008; Vago & Silbersweig, 2012), the overarching

theme is that mindfulness is made up of many mechanisms "by which mindfulness functions to

reduce suffering and create a sustainable healthy mind using a framework of self-processing"

(Vago & Silbersweig, 2012, p. 23). Kabat-Zinn further emphasized that "the only moment we

ever have … is now" (Paulson, Davidson, Jha, & Kabat-Zinn, 2013, p. 91). Thus, his is the

definition that will be the basis of the present study, as it encompasses the mechanisms and the

idea of the present moment. Attention will also be given to exploring the mechanisms that make

up its functioning, such as awareness, consciousness, attention, and metacognitive-awareness

(Brown & Ryan, 2003; Chambers, Gullone, & Allen, 2009).

Theoretical Framework of Mindfulness

Despite the prevalence of mindfulness in research across many fields, there is a surprising

inconsistency of theoretical frameworks (Hölzel, et al., 2011). Hölzel et al. (2011) list in their

proposed framework attention regulation; body awareness; emotion regulation including

reappraisal and exposure, extinction, and reconsolidation; and change in perspective on the self.

More broadly, Shapiro, Carlson, Astin, and Freedman (2006) explore what they call the

mechanisms of mindfulness through intention, attention, and attitude. Shapiro et al.'s (2006)

mechanisms were also adopted by Albrecht, Albrecht, and Cohen (2012). Other research describes mindfulness from behavioral, mind-body, and integrative medicine perspectives (Kabat-Zinn, 2003; Ludwig & Kabat-Zinn, 2008). Awareness, consciousness, attention, and metacognition are generally accepted as the foremost mechanisms (Brown & Ryan, 2003), and will be used for the theoretical framework for this study.

Awareness, consciousness, attention, and metacognitive awareness. One of the most widely accepted mechanisms of mindfulness is awareness, consciousness, and attention (Brown & Ryan, 2003). Awareness is defined as "the background 'radar' of consciousness, continually monitoring the inner and outer environment" (Brown & Ryan, 2003, p. 822). Consciousness is the combination of awareness and attention, with attention being the "process of focusing conscious awareness, providing heightened sensitivity to a limited range of experience" (Brown & Ryan, 2003, p. 822). The idea is that people who are mindful pay attention to stimulation in the here-and-now, including their passing thoughts and feelings. Those who do not pay attention get lost in automatic thoughts, so they worry about the past or anxious about the future. In other words, they ruminate (Brown & Ryan, 2003).

During mindfulness practice, thoughts and feelings are experienced and allowed to pass without judgment as they occur. Experiencing means "focusing attention on the experience of thoughts, emotions, and body sensations … and simply observing them" without attaching meaning (Hölzel, Lazar, Gard, Schuman-Oliver, Vago, & Ott, 2011, p. 538). Experiencing is also known as reperceiving and bare attention. Reperceiving is a "meta-mechanism of action" made up of mechanisms that lead to positive change, the most important one to this framework being self-regulation. Self-regulation is a feedback loop of intention and attention that allows for positive change to happen (Shapiro, Carlson, Astin, & Freedman, 2006, p. 379). Paying attention

without assigning judgment (i.e., practicing mindfulness) allows for this positive change. Bare attention is a Buddhist concept that describes this "awareness of what actually happens to us and in us, at the successive moments of perception … and is called 'bare' because it attends to the bare facts of a perception without reacting to them by deed, speech, or mental comment" (Thera, 2001, p. vii).

Metacognitive awareness is also referred to as metaconsciousness and meta-awareness. This awareness of awareness "is one's explicit knowledge of the current contents of thought," and it "corresponds to an intermittent process whereby individuals periodically notice the current contents of their mind" (Schooler, Smallwood, Christoff, Handy, Reichle, & Sayette, 2011, p. 321). Whereas the mechanism of awareness, consciousness, and attention is focused on the present task, metacognitive awareness is the awareness that one is aware—a concept central to mindfulness (Chambers, Gullone, & Allen, 2009). This is why the present framework includes metacognitive awareness.

Mindfulness, like Buddhist meditation, uses metacognitive awareness to experience negative thoughts and feelings as they occur in order to break the cycle of stress reactivity in which a thought elicits a feeling without awareness of the instigating thought (Maex, 2011; Teasdale et al., 2002). The person with metacognitive awareness acknowledges the thought as a thought and the feeling as a feeling instead of getting swept away in a stress response by emotional triggers, thereby interrupting the unconscious process of rumination (Teasdale et al., 2002; Williams, 2010). The act of bringing these automatic thoughts into consciousness is a function of mindfulness.

The theoretical framework proposed here is an integration of the various mechanisms that other researchers have described. As stated, mindfulness occurs when the individual becomes

aware, conscious, and attentive of the present moment and aware that they are aware. The rest of this section will cover the benefits of mindfulness in terms of halting brain processes that are associated with negative mood and creating brain processes that are associated with positive mood. For instance, before mindfulness occurs, automatic thoughts, self-focused attention, and mind wandering operate in an unconscious feedback loop. The act of mindfulness is made up of the mechanisms of awareness, consciousness, attention, and metacognitive awareness. Once awareness—and awareness of awareness—occur, affect and behavior changes can happen through emotion regulation and self-regulation.

Automatic thoughts, self-focused attention, and mind wandering continue until attention is diverted (Muraven, 2005; Risko, Anderson, Sarwal, Engelhardt, & Kingston, 2012). Automatic thoughts are involuntary cognitions that happen without the person's consent, like a panic attack (McNally, 1995), and can result in rumination or emotional numbness, depending on whether the anxiety causes the person to engage or disengage, respectively (Troop-Gordon, Rudolph, Sugimura, & Little, 2015). There is an evolutionary benefit of automatic thoughts' keeping us almost instantly safe from threats without having to analyze the situation (Williams, 2010), but negative automatic thoughts correlate negatively with positive emotions (Schniering & Rapee, 2004) and positively with depression (Hollon & Kendall, 1980; Riley, Lee, & Safren, 2017), tension-type headaches (Yücel et al., 2002), and sexual dysfunction in both men and women (Nobre & Pinto-Gouveia, 2008). Automatic thoughts also have a high association with anxiety (McNally, 1995). A well-accepted reason for the strong correlations between automatic thoughts and psychological distress or dysfunction is that these involuntary, unconscious thoughts become embedded into a person's belief system or schema, and "statelike negative automatic thoughts and depression ensue" (Lightsey, 1994, p. 325).

Mindfulness is one answer to decrease the emotional impact of automatic thoughts. Through awareness, consciousness, and attention, mindfulness breaks this cycle of automatization (Brown & Ryan, 2003). Instead of being swept up into emotional distress by reactive thought processes, the person practicing mindfulness observes the thoughts without judgment and accepts them, not only bringing the thoughts into awareness, but also removing the fear they instilled while unconscious (Kang, Gruber, & Gray, 2013).

Self-focused attention is defined as "an awareness of self-referent, internally generated information that stands in contrast to an awareness of externally generated information derived through sensory receptors" (Ingram, 1990, p. 156). Internally generated information includes "bodily sensations, cognitions, and emotional states" (Baer, 2009, p. 17). It is well understood that self-focused attention and negative affect, such as depression and anxiety, are highly correlated (Wood, Saltzberg, Neale, Stone, & Rachmiel, 1990). This relationship is particularly due to ruminative self-focus, defined as "brooding" and "not reflective pondering" (Moberly & Watkins, 2008, p. 314; Mor & Winquist, 2002; Wood, et al., 1990). In other words, it appears that those whose attention is internally focused in involuntary, repeated cycles are also at increased risk for depression and anxiety. Reduction of self-focused attention is one possible explanation to why MBSR training significantly improves mindfulness levels (Baer, 2009; Carmody & Baer, 2008; Shapiro, Carlson, Astin, & Freedman, 2006). While self-focused attention can be negative, it can also be positive, and mindfulness can shift it toward the positive. For example, self-focused attention can increase self-regulation (Pyszczynksi & Greenberg, 1992) and emotion regulation (McFarland, Buehler, von Ruti, Nguyen, & Alvaro, 2007). Mindfulness practice can improve self-regulation and emotion regulation by improving self-focused attention. This improvement happens because mindfulness practice encourages internal

focus on sensations, cognitions, and emotions, reducing rumination and increasing awareness of present-moment details, which is "nonjudgmental and nonreactive rather than ruminative and self-critical" (Baer, 2009, p. 18).

Mind wandering is the next unconscious act that competes for attention. It is the drifting of the mind to thoughts or feelings that are unrelated to the current situation or circumstances, and it is often triggered by stimuli (Smallwood & Schooler, 2006). More formally, it is defined as "a shift of attention from a task to unrelated concerns," and it can have a significantly negative impact on cognitive performance (Mrazek, Franklin, Phillips, Baird, & Schooler, 2013, p. 776). Schooler et al. (2011) describe it as a cycle between "decoupling" attention away from perception and toward consciousness, meaning that at some point after disengaging from the current task, metacognitive awareness takes over and the individual is aware of the mind wandering (p. 319).

The human brain naturally wanders, and it wanders about 47% of the time (Killingsworth & Gilbert, 2010; Smallwood, Fishman, & Schooler, 2007). Mind wandering is associated with a higher frequency of negative moods, including depression (Smallwood, Fitzgerald, Miles, & Phillips, 2009; Smallwood, O'Connor, Sudbery, & Obonsawin, 2007). It is also associated with educational functioning, including poor retrieval of information (Smallwood et al., 2007), longer time spent on tasks (e.g., a long lecture; Risko, Anderson, Sarwal, Engelhardt, & Kingstone, 2012), less information retained (Risko, et al., 2012), and new information not getting encoded (Smallwood, Fishman, & Schooler, 2007). On the positive side, Smallwood, et al. (2007) mentioned that the internal attention of mind wandering could benefit learners by triggering attached memories, which is a component of problem solving; however, this is often not the case when the mind wanders.

Research also indicates that mindfulness training can decrease mind wandering and increase cognitive performance (Mrazek, Franklin, Phillips, Baird, & Schooler, 2013). In a study on meditation training on the mind wandering process, Hasenkamp, Wilson-Mendenhall, Duncan, and Barsalou (2012) found that when participants noticed their mind was wandering, the default network area of their brain that was active during inattention (e.g., inattention to their breathing) decreased. This is a particularly important finding because if training can improve attention and focus, then perhaps it can also improve cognitive performance (Mrazek et al., 2013). Mindfulness' correlation with decreased mind wandering fits well with the definition of mindfulness in terms of paying attention in the present moment (Kabat-Zinn, 2013).The positive processes caused by mindfulness are emotion regulation and self-regulation. Thompson (1994) defines emotion regulation as "[consisting] of the extrinsic and intrinsic processes responsible for monitoring, evaluating, and modifying emotional reactions, especially their intensive and temporal features, to accomplish one's goal" (p. 27-28). This means that emotion regulation can increase, decrease, or stop emotional arousal and requires "strategies of emotion self-management" and the management of external influences (Thompson, 1994, p. 28). In terms of modifying the "intensive and temporal features" of emotional reactions, emotion regulation can enhance or subdue features such as intensity of emotions instead of just the emotions themselves. This difference is due to the various facets of emotion: "physiological arousal, neurological activation, cognitive appraisal, attention processes, and response tendencies;" therefore, emotion regulation refers to the overarching concept that includes all of these processes (Thompson, 1994, p. 30).

There are nine skills in the adaptive emotion-regulation that make up the emotion-regulation model:

(a) consciously process emotions/be aware of emotions, (b) identify and label emotions, (c) interpret emotion-related body sensations correctly, (d) understand the prompts of emotions, (e) support oneself in emotionally distressing situations, (f) actively modify negative emotions in order to feel better, (g) accept emotions, (h) be resilient to/tolerate negative emotions, and (i) confront emotionally distressing situations in order to attain important goals. (Berking et al., 2008, p. 1230-1231)

These emotion regulation skills support all of the components of Kabat-Zinn's (2013) mindfulness definition: (1) paying attention (2) on purpose (3) in the present moment, (4) without judgment. Essentially, the attentional focus aspect of mindfulness supports emotion regulation by paying attention to emotions and detaching from them so that the individual can alter their responses to thoughts in the various facets of the emotion-regulation model (Berking et al., 2008; Chambers, Gullone, & Allen, 2009). This noticing of and accepting thoughts is different from the cognitive reappraisal method used in cognitive behavioral therapy, in which individuals confront maladaptive thoughts instead of detaching from them (Kang, Gruber, & Gray, 2013).

Though cognitive reappraisal is thought to be an important part of mindfulness meditation, the consensus among researchers is that 1) the experiential process of detachment or emotion differentiation during mindfulness practice is what enables emotion regulation (Grecucci, Pappaianni, Siugzdaite, Theunink, & Job, 2015) and that 2) those who report higher levels of mindfulness have lower levels of negative affect (Brown & Ryan, 2003; Chambers, Lo, & Allen, 2008; Hill & Updegraff, 2012; Hülsheger, Alberts, Feinholdt, & Lang, 2013). The positive impact that mindfulness has on emotion regulation and, consequently, on psychological

health, is of particular interest to this study in terms of stress and emotional well-being (Hill & Updegraff, 2012).

While emotion regulation is about shifting attention to emotions, thereby detaching from reactive emotions, self-regulation is about regulating behavior or "the capacity to behave oneself and resist temptation" (Kaplan & Berman, 2010, p. 43). It is also about inhibiting impulses or mindless behaviors (Hofmann, Schmeichel, & Baddeley, 2012) and cultivating and directing attention (Carmody, 2009). Similar to what happens in the emotion regulation process when unconscious and conscious thoughts impact our emotions, unconscious and conscious thoughts in the self-regulation process impact our behavior (Posner & Rothbart, 2000). Impulses occur, but self-regulation overrides them and replaces them "with another response that leads the person's behavior towards a selected aim" (Luszczynska, Diehl, Gutierrez-Dona, Kuusinen, & Schwarzer, 2004, p. 556).

Metacognitive awareness has been shown to improve students' self-control, or self-regulation (Shapiro, 1984; Zimmerman, 2002). Once the student is aware of a behavior and how that behavior is not helping them reach their goal, the feedback loop of involuntary thought processes stops. Awareness of the automatic thoughts or unconscious behaviors lets the individual regulate themselves. In other words, they can then make a conscious decision to halt the cycle and implement change (McNally, 1995; Posner & Rothbart, 2000).

Because of its ability to stop impulses and redirect behavior, self-regulation has been closely compared with executive functioning, which involuntary thoughts hijack during mind wandering (Christoff, Gordon, Smallwood, Smith, & Schooler, 2009; Mason et al., 2007). It is not surprising, then, that both of these functions—self-regulation and executive functioning—share the same neural resource of voluntary attention. When the involuntary, mindless, or

automatic thoughts take over executive functioning, conscious decisions do not take place (Posner & Rothbart, 2000)

In addition to negative affect's correlations with self-focused attention, automatic thoughts, and mind wandering, it is also correlated with self-regulation; however, low self-regulation is strongly correlated with negative affect (Muraven, 2005). This self-regulation knowledge has been shown to play a major role in understanding psychopathology, and a focus on this connection may lead to "advances in diagnosis, prevention, and possible treatment of developmental problems like attention deficit disorder and learning disabilities" (Posner & Rothbart, 2000, p. 427).

Mindfulness has been connected with an improvement in self-regulation because mindfulness improves attention (Kabat-Zinn, Lipworth, Burney, & Sellers, 1987; Vago & Silbersweig, 2012). For example, although research had already established that diverting attention from pain improves the self-regulation of pain, Kabat-Zinn, Lipworth, and Burney (1985) found that mindfulness improved pain levels in their study's participants. They concluded that it may be "the regulation and intensity of one's attention, and one's belief in a method based on past experience, rather than the particular object or process attended to" that is effective in coping with pain (Kabat-Zinn et al., 1985, p. 185). In other words, it is attention or attention of attention rather than simply diverting attention that improves self-regulation.

The integration of the various components of mindfulness seems to be what improves self-regulation, according to Hölzel, et al. (2011). The Hölzel et al. (2011) framework of mindfulness includes attention regulation, body awareness, emotion regulation, and "the change in perspective on the self" (p. 551). Though these constructs describe part of what happens during mindfulness, they omit self-regulation and the cognitive processes that mindfulness

interrupts. For this reason, the theoretical framework for the current study includes awareness, consciousness, attention, and metacognitive awareness. This meta-mechanism reduces unconscious cognitive processes like automatic thoughts, mind wandering, and self-focused attention, and it increases positive cognitive processes like emotion regulation and self-regulation. Automatic thoughts, mind wandering, and self-focused attention operate in a feedback loop, which gets interrupted by the mindfulness mechanisms. Once thoughts become voluntary, attention focuses on managing emotions and behavior. Because mindfulness is a process and not a fixed state, all parts of this framework operate in a larger feedback loop.

Application of Mindfulness

As previously mentioned, the Buddhist dharma's intentionally broad understanding of suffering encompasses all suffering (Maex, 2011), allowing contemporary researchers to test its benefits in a wide variety of fields. The connection between mindfulness and medicine began this trend that is thriving today. Since 1979, with Kabat-Zinn's development of Mindfulness-Based Stress Reduction (MBSR) for medical patients with chronic pain, mindfulness has influenced medicine, business, education, and counseling fields (Kabat-Zinn, 2013). While this is not an exclusive list of fields, exploring the mindfulness' influence on them will illustrate the range to some extent.

Although mindfulness is perhaps most generally thought about in terms of stress reduction, current trends include improving "chronic medical symptoms" and discovering the physiological mechanisms of mindfulness-based trainings (Serpa, Taylor, & Tillisch, 2014, p. S22). For example, MBSR was initially developed to complement patients' medical treatments and to help them focus on what was right with themselves instead of what was wrong (i.e., the illness). Kabat-Zinn's (1981, 1982, 1984) well-known studies on mindfulness' impact on pain

management showed that participants who practiced mindfulness experienced decreased pain or decreased attention to pain. By focusing on the present moment, moment-by-moment, on purpose and without judgment, patients learn to work with their suffering, to face it, and to move toward healing and well-being.

Since Kabat-Zinn's (1981, 1982, 1984) revolutionary findings on mindfulness and pain management, medical researchers have delved into myriad studies to discover how else mindfulness can support and enhance health care. In 2016 alone, there were 994 mindfulness studies published in medical-related journals. Studies throughout the years have ranged greatly from using mindfulness to treat autoimmune diseases, such as lupus (Horesh, Glick, Taub, Agmon-Levin, & Shoenfeld, 2017), to psychological disorders (Gallego, Aguilar-Parra, Cangas, Langer & Mañas, 2014; Serpa, Taylor, & Tillisch, 2014). Mindfulness has had mixed results on alleviating physical diseases, however. Examples include improvements in the physical symptoms of systemic lupus erythematosus (Horesh et al., 2017) but a lack of significant findings for patients with rheumatoid arthritis (Pradhan et al., 2007) and vascular health issues (Abbott et al., 2014).

Mindfulness research has had a significant impact on understanding treatment options for certain psychological disorders, though. For example, research shows that MBSR training can greatly reduce levels of stress, anxiety, and depression in college and nursing students (Gallego, Aguilar-Parra, Cangas, Langer & Mañas, 2014; Murphy, 2006; Song & Lindquist, 2015), even when compared to a group of students participating in a physical education program (Gallego et al., 2014). It has also been shown to alleviate anxiety, depression, and suicidal ideation in veterans (Serpa, Taylor, & Tillisch, 2014). The Serpa et al. (2014) study is particularly important because it included participants with a variety of diagnosed psychological disorders, including

psychosis, severe personality disorders, active substance abuse disorders, anxiety, depression, and suicidal ideation. In addition to improving symptoms of anxiety and depression, the MBSR training seemed to improve functional mental health (Serpa et al., 2014) as well as insomnia and other sleep disturbances (Garland, Zhou, Gonzalez, & Rodriguez, 2016). The impact of mindfulness in the business fields, though not as extensive as in the medical field, has been increasing in recent years, with some of the focus on job and workplace performance (Dane & Brummel, 2014; Hülsheger, Alberts, Feinholdt, & Lang, 2013; King & Haar, 2017; Leroy, Anseel, Dimitrova, & Sels, 2013; Ruedy & Schweitzer, 2010). For example, Dane and Brummel (2014) found a positive correlation between mindfulness and workplace performance, even when accounting for work engagement. King and Haar (2017) looked at the impact of mindfulness on leadership performance in managers. They hypothesized that since mindfulness practice facilitates self-regulation, leaders who were trained in mindfulness would have improved self-regulatory behaviors, thereby translating to improved leadership performance. Because of the increased self-awareness provided by mindfulness, the managers' leadership performance improved.

Research on mindfulness in the business field has also addressed job satisfaction, work engagement, and ethical decision making. For example, Hülsheger, Alberts, Feinholdt, and Lang (2013) found that not only did mindfulness at work improve emotion regulation, it also decreased emotional exhaustion and increased job satisfaction. Fortney, Luchterband, Zakletskaia, Zgierska, and Rakel (2013) found that mindfulness increased job satisfaction and compassion and decreased burnout in primary care physicians. Leroy, Anseel, Dimitrova, and Sels (2013) found that mindfulness improves job satisfaction by allowing the shift from difficult or overwhelming task to acceptance. Lyddy and Good (2017) refer to this change as shifting the

gear from the doing mode (i.e., the problem) to the being mode. Finally, Ruedy and Schweitzer (2010) looked at mindfulness and ethical decisions. They found that those who had higher levels of mindfulness had more ethical intentions and fewer ethical infractions. They also found that the participants who were more mindful "indicated a greater emphasis on moral principles" (p. 81) than did those who were less mindful.

Application of Mindfulness to the Field of Education

Another major focus of mindfulness research is in education. Mindfulness studies have been implemented at all educational levels, including elementary, middle, high schools, and various types of colleges and universities. At the elementary school level, studies have shown that teaching mindfulness increases the students' selective attention, decreases test anxiety, and improved teacher ratings of ADHD behaviors (Napoli, Krech, & Holley, 2005). It improves paying attention, relaxation, self-regulation, and participation in low-income and ethnic minority school children (Black & Fernando, 2014, p. 1245). It also decreases anxiety, "such as panic, generalized anxiety and obsessive-compulsiveness, as well as overall internalizing problems" in fourth, fifth, and sixth graders (Lam, 2016, p. 3295). Mindfulness practice has also been shown to improve attention in fifth graders who had generalized anxiety (Reid & Miller, 2009).

Studies on mindfulness and middle and high school students have shown that there is a positive correlation between academic performance and climate of the classroom (López-González, Amutio, Oriol, & Bisquerra, 2016). Middle schoolers who practiced mindfulness had improved attention and awareness, and homeless youth who practiced mindfulness in the classroom had improved emotional wellbeing (Viafora, Mathiesen, & Unsworth, 2015). In one study, students rated that mindfulness training "helped them become more aware of their emotions, thoughts, and feelings, as well as being more present in life and coping with stress and

negative thinking" (Luiselli, Worthen, Carbonell, & Queen, 2017, p. 132). A meta-analysis that looked at meditation interventions in schools found that 33% of the 15 peer-reviewed studies had medium to large effects in well-being, social competence, and academic achievement (Waters, Barsky, Ridd, & Allen, 2015). Based on the results of the studies used in the meta-analysis, Waters et al. (2015) recommended meditation programs that focus on improving cognitive functions and emotion regulation.

A multitude of research has been done on mindfulness and college students. In 2012, Mahani (2012) called for higher education to incorporate contemplative education into the college-level curriculum, and researchers interested in a wide variety of possible mindfulness effects took the challenge, aware of it or not. Study findings abound. For example, authors of one study discovered that mindfulness training decreased overeating and meal skipping (Bahl, Milne, Ross, & Chan, 2013). Authors of another study found that mindfulness decreased anxiety and depression when college students were under academic stress (Cole et al., 2015), while other researchers concluded that it decreased stress and anxiety in general (Bamber & Kraenzle Schneider, 2016). Two additional studies showed that mindfulness "moderated the effects of loneliness on academic achievements" (Rosenstreich & Margalit, 2015, p. 142) and promoted "healthy transition to college [for] first-year college students" (Dvořáková et al., 2017, p. 259).

Of interest to the present study is mindfulness training in the college classroom. Many of the studies that look at mindfulness training in educational settings, however, take place in sessions outside of the classroom (Lam, 2016; Shearer, Hunt, Chowdhury, & Nicol, 2016) or in a class dedicated specifically to learning mindfulness (Caldwell, Harrison, Adams, Quin, & Greeson, 2010; Holland, 2006). There are some studies in which students receive in-class training, though the majority of the studies in which students received in-class training took

place in elementary, middle, and high schools (López-González, et al., 2016; Viafora, et al., 2015).

A few in-class mindfulness studies at the college level do exist, though. Of particular interest for the current study are brief, guided mindfulness meditation studies, like the one Hartel, Nguyen, and Guzik (2017) conducted with graduate students. The professors of a foundations course in the Library and Information Science graduate program at the University of Toronto ran an exercise at the start of each class and reported that students felt more relaxed, focused, and ready to learn. Haynes, Irvine, and Bridges (2013) discussed contemplative practices that were implemented across nine college courses. Some of the practices included bowing at the beginning and end of each class to acknowledge being present and respecting the time spent in class, relaxing the eyes into a soft gaze, mindful breathing, and mindfulness. Most closely to the focus of the present study is one by Napora (2013), which was conducted to "investigate the impact of classroom-based meditation practice on undergraduate college students' mindfulness, cognitive engagement and academic performance, as well as to determine if relationships exist between these measures" (p. 121).

To support the importance of introducing mindfulness into the classroom, Bush (2011) quoted William James from *Principles of Psychology*:

> The faculty of voluntarily bringing back a wandering attention, over and over again, is the very root of judgment, character, and will …. An education which should improve this faculty would be the education par excellence. But it is easier to define this ideal than to give practical directions for bringing it about. (p. 185)

This quote embodies the concept of mindfulness as explored in the theoretical framework section. It is also evidence for a call to address mind wandering in education long before

mindfulness was an understood technique in the West (Ludwig & Kabat-Zinn, 2008; Maex, 2011). *Principles of Psychology* was first published in 1890—almost 90 years before Kabat-Zinn (1979) published the article in which he suggested chronic pain could be better managed through paying attention to it, moment by moment, in the present moment and without judgment.

Mindfulness is part of the larger contemplative movement in higher education, but although the number of faculty who are using mindfulness in their classrooms is growing, much of the literature they publish just describes their practices and the theories that support their use (Bush, 2011; Francl, 2012; Wapner, 2016; Zajonc, 2006; Zajonc, 2013). Michelle Francl of Bryn Mawr College incorporates contemplative practices, such as mindfulness, into her chemistry curriculum to provide "scientists with another set of ways to reflect on their work in relation to the larger world" (Bush, 2011, p. 191). Arthur Zajonc of Amherst teaches physics and incorporates the mindful experiences of working with and studying natural and synthetic objects (Bush, 2011; Zajonc, 2006; Zajonc, 2013). Paul Wapner of the American University teaches Practical Environmentalism and uses mindfulness in the classroom to help students decrease stress and increase presence in order "to be be aware of their intentions for the course" (Bush, 2011, p. 193). Wapner (2016) warns that in addition to the difficulty of showing the effectiveness of contemplative practices in the classroom, implementing such practices into the curriculum can create resistance in students who see it as irrelevant, silly, or religious. While enthusiastic proponents of contemplative practices in higher education, none of these faculty who use mindfulness in the college classroom has published data to show the results of their work to the best of this author's knowledge.

There are a handful of other studies in which mindfulness is used in the classroom at the college level, but they focus on the teachers' use of mindfulness, not the students' (Kernochan,

McCormick, & White, 2007; Vacarr, 2001). While this is an important line of study, it does not provide data that informs the current study. With this lack of data on the impact that mindfulness practice in the classroom has on college students, the current study aims to add to the literature to fill in this gap.

Mindfulness-Based Counseling

In addition to being used in various fields such as medicine, business, and education, mindfulness has also been found to work well in the counseling setting. The use of mindfulness in counseling began in 1993 with dialectical behavior therapy (Brown, Marquis, & Giuffrida, 2013; Linehan, et al., 2006), and there is much evidence to support the effectiveness of the four most commonly used therapies: mindfulness-based stress reduction (MBSR), mindfulness-based cognitive therapy (MBCT), acceptance and commitment therapy (ACT; Hayes, Luoma, Bond, Masuda, & Lillis, 2006), and dialectical behavior therapy (DBT; Linehan & Dawkins, 1995). MBSR and MBCT are the most frequently used in educational settings at the higher education level, so those are the two that will be explored here as examples of mindfulness-based counseling. Of these two counseling approaches, the focus will primarily be on MBSR because "evidence supports that MBSR improves mental health and MBCT prevents depressive relapse" (Fjorback, Arendt, Ørnbøl, Fink, & Walach, 2011, p. 102). The current study is looking at the improved mental health of students and not specifically at the prevention depression relapse.

Mindfulness-Based Stress Reduction

As previously mentioned, the majority of research studies exploring the relationships between mindfulness and education are in K-12 populations and in programmed sessions outside the classroom. Frequently, that programming is MBSR and offered as either extracurricular opportunities or short courses designated for just learning mindfulness (Viafora, Mathiesen, &

Unsworth, 2015). Kabat-Zinn (1992) first implemented MBSR in 1979, publishing the results in 1982. He developed a 10-week program originally named the Stress Reduction and Relaxation Program to teach patients to manage their chronic pain through mindfulness meditation. The goal was to improve their self-regulation by teaching them to detach their attention through observation. Kabat-Zinn (1992) suggested that this causes "an 'uncoupling' of the sensory dimension of the pain experience from the affective evaluation alarm reaction and reduce the experience of suffering via cognitive reappraisal" (p. 33). In other words, the person suffering from pain learns how to detach from mind wandering and ruminating tendencies and become aware—and to become aware of the awareness. Kabat-Zinn (1992) hypothesized that if mindfulness meditation training could help patients become aware of their pain and observe "intense feeling in the body as bare sensation" (p. 35), then they could detach from labeling the sensations as pain or hurt. From the results he determined that

> Beyond the reduction in pain levels and pain-related behaviors, the majority of patients evidenced attitudinal and behavioral changes which can be attributed to the regular practice of mindfulness meditation: an ability to observe mental events, including pain, with a sense of detachment; cognitive changes which appear directly related to the experience of detachment; and an increased awareness of oneself in relationship to others and to the world. (Kabat-Zinn, 1982, p. 46)

The patients were able to better cope with their chronic pain, meaning that although the pain may have persisted, they were better able to exist in the present moment and relax without ruminating on the pain.

Kabat-Zinn's (1992) 10-week Stress Reduction and Relaxation Program met once a week for two hours and included three mindfulness meditation practices: 1) sweeping, also known as

the body scan; 2) mindfulness breath and other perceptions; and 3) hatha yoga postures. The five steps to the meditation instructions were to 1) attend to a primary observation, 2) be aware of each moment in the moment, 3) notice when attention drifts and gently bring it back, 4) notice and observe feelings when they occur and bring attention back to the primary observation once they subside, and 5) notice the actual thinking process in order to not unconsciously react to it and to not attach judgment to the thoughts.

MBSR is now usually conducted as an 8-week intervention and has been expanded to treat more than pain (Baer, 2009; Kabat-Zinn, et al., 1992). For example, is has also been used to help counseling students manage their self-care by reducing their reactivity to clients' stress and anxieties (Newsome, Christopher, Dahlen, & Christopher, 2006) and to help new counseling professionals reduce their chances of burnout (Cohen & Miller, 2009). It has helped college students decrease their stress and anxiety (Murphy, 2006), improve their first-year adjustment (Ramler, Tennison, Lynch, & Murphy, 2016), decrease test anxiety (Sampl, Maran, & Furtner, 2017), and support forgiveness (Oman, Shapiro, Thoresen, Plante, & Flinders, 2008). It has helped clinical and non-clinical populations improve their mental health (Baer, Carmody, & Hunsinger, 2012; Fjorback, Arendt, Ørnbøl, Fink, & Walach, 2011); Korean nursing students improve their levels of depression, anxiety, stress, and mindfulness (Song & Lindquist, 2015); veterans reduce their anxiety, depression, and suicidal ideations (Serpa, Taylor, & Tillisch, 2014); and healthy individuals improve their quality of life (Khoury, Sharma, Rush, & Fournier, 2015). Bowen and Kurz (2011) showed that practicing mindfulness in between mindfulness sessions may improve levels of mindfulness, at least in the short term.

The effectiveness of MBSR is well documented. Khoury, Sharma, Rush, and Fournier (2015) conducted a meta-analysis of 29 studies with 2,668 participants and found that "MBSR is

moderately effective in both within group and between group analyses" (p. 524), meaning that results across studies show that participants who receive MBSR training benefit when compared to their pre-MBSR selves and when compared to control groups. Khoury et al. (2015) grouped the studies into target populations and found that health professionals gained the most from MBSR training, although long-term effects were undetermined across populations since most studies do not report follow-up data. An exception is Kabat-Zinn (1987), who did a four-year follow-up to his chronic pain management study and found that participants had maintained reductions in negative body image, number of medical symptoms, and global psychology symptomatology, but not significant reductions in pain.

One of the interests of the current study is the impact that mindfulness practice has on mindfulness—particularly, the impact that the mechanisms of mindfulness (i.e., attention, consciousness, awareness, and metacognitive attention) have on non-mindfulness (i.e., automatic thoughts, mind wandering, and self-focused attention). While many studies have not looked at whether their MBSR impacted participants' mindfulness levels, many have (Khoury, Sharma, Rush, & Fournier, 2015). For example, Carmody and Baer (2008) found that MBSR increased mindfulness, which mediated "the relationships between formal mindfulness practice and improvements in psychological functioning" (p. 23). More broadly, they found that "mindfulness meditation leads to increases in mindfulness, which in turn leads to symptom reduction and improved well-being" (Carmody & Baer, 2008, p. 23). Serpa, Taylor, and Tillisch (2014) found that when mindfulness increased, the depression, anxiety, and mental health scores of their population of veterans were directly impacted and improved.

There are studies that show the effectiveness of MBSR in terms of the mechanisms of mindfulness. Automatic thoughts, mind wandering, and self-focused attention are negative

processes that mindfulness decreases. Baer (2009) measured the effects of MBSR on self-focused attention and found that mindfulness increased a nonjudgmental and nonreactive form of self-focused attention instead of the ruminative form that is harmful to psychological health. This means that after participating in MBSR, participants were able to notice internal stimuli without reacting to the extent that they did before. Participants in this study were also able to divert their attention to external stimuli at higher rates, which Baer (2009) attributed to more flexible attention, or, "the ability to shift their attention as desired rather than focusing selectively and rigidly on threatening or unpleasant stimuli" (p. 18).

Brown, Marquis, and Giuffrida (2013) discussed automatic thoughts in their overview of mindfulness-based interventions in counseling, one intervention being MBSR. They reported that such interventions allow the practitioner to become aware of their automatic processes and to notice them without judgment. Mind wandering was addressed in a New York Academy of Sciences transcribed interview on mindfulness (Paulson, Davidson, Jha, & Kabat-Zinn, 2013). Jha spoke of a study he conducted with Michel Baim from the University of Pennsylvania on mind wandering and adults with ADD. They found that the mindfulness training improved participants' attention and warded off mind wandering.

Attention, awareness, consciousness, and metacognitive awareness are the mechanisms that reduce the negative processes. Brown and Ryan (2003) discussed their MBSR intervention on awareness, attention, and consciousness and concluded that consciousness—in the context of mindfulness—needs to be redefined from reflexive consciousness to "prereflexive" consciousness, because consciousness is nonevaluative even with the addition of self-awareness. Brown and Ryan (2003) concluded from their intervention that the MBSR training improved attention and awareness, therefore improving "more autonomous behavioral regulation and

emotional well-being" (p. 843). Bergen-Cico, Possemato, and Cheon (2013) report that MBSR training is essentially "training in metacognition and attention, which are critical for learning, emotional regulation, and the ability to overcome habitual habits" (p. 358). Mindfulness training improves these mechanisms that support psychological well-being (Brown & Ryan, 2003).

Improved emotion regulation and self-regulation are evidence-based outcomes of successful mindfulness training. In a review of mindfulness-based interventions in schools, including MBSR training, Waters, Barsky, Ridd, and Allen (2015) noted that many studies have found significant increases in emotion regulation after the interventions. Further, Waters et al. (2015) reported that the improved emotion regulation is associated with improvements in empathy, mood, social behaviors, social function, academic performance, and academic achievement. While there is much literature on the constructs that impact self-regulation, for example, improving self-focused attention improves self-regulation (Baer, 2009), there is little on the direct connection between MBSR and self-regulation. For instance, Webb, Perry-Parrish, Ellen, and Sibinga (2017) found that MBSR improved self-regulation through coping and psychological function in youth with HIV. Two of their previous studies (Kerrigan et al., 2011; Sibinga, Perry-Parrish, Thorpe, Mika, & Ellen, 2014) showed "positive behavioral changes" by decreasing conflict engagement and increasing self-care (Webb et al., 2017).

One possible reason for the indirect research on MBSR and self-regulation is that emotion regulation and self-regulation may inherently be the same thing since. Self-regulation is often measured by looking at constructs of emotion, and Vago and Silbersweig (2012) state that "emotion is measured through multiple components including cognitive, viscerosomatic, behavioral, and physiological responses" (p. 18). Another reason for few direct connections between MBSR and self-regulation is the well-established understanding that improved

attention, consciousness, and self-awareness, and de-automatization lead to improved self-regulation (Baer, 2009; Kabat-Zinn, Lipworth, & Burney, 1985; Kang, Gruber, & Gray, 2013; Vago & Silbersweig, 2012). As Burg, Wolf, and Michalak (2012) state, "On a fundamental level, self-regulation is an inherent characteristic of mindfulness itself. This is evident in the definition of mindfulness, namely, paying attention in a certain way: on purpose, in the present moment, and nonjudgmentally" (p. 135). In other words, to have self-regulation is to be mindful.

Mindfulness-Based Cognitive Therapy

MBCT began in 2002 with Segal, Williams, and Teasdale' publication, *Mindfulness-Based Cognitive Therapy for Depression: A New Approach to Preventing Relapse*. It was further publicized through Teasdale et al.'s (2002) study on metacognitive awareness and depression relapse prevention. The creators of MBCT saw a need to make their clients less vulnerable to depression relapses post recovery, because even though their symptoms had receded, their negative thoughts and emotions could be triggered by even minimal mood changes (Williams & Kuyken, 2012). Having them develop awareness through mindfulness seemed to help them build resilience (Teasdale et al., 2002).

MBCT is a combination of Beck's cognitive therapy and Kabat-Zinn's (1982) MBSR with the idea that if metacognitive awareness can make individuals with depression view their negative thoughts and feelings as "negative events, rather than as the self," then they can reduce their likelihood of relapsing into depression (Teasdale et al., 2002, p. 275). In other words, objectively viewing thoughts as thoughts and feelings as feelings instead of being reactively swept away with them and instead of viewing them as reality, is being metacognitively aware. It is this detachment or decentering that reduces the chances of depression relapse (Teasdale et al., 2002). The two main differences between MBCT and MBSR are that MBCT's focus is mostly

on thoughts and it is a prevention program to reduce the likelihood of depression recurrence (Fjorback, Arendt, Ørnbøl, Fink, & Walach, 2011).

Additional studies have found effective results with MBCT. Fjorback, Arendt, Ørnbøl, Fink, and Walach (2011) found that MBCT is "an effective and efficient way to prevent relapse in recovered, depressed patients with three or more previous episodes" (p. 117). Segal et al. (2010) found that it prevents relapse of recurrent depression. In a four-week, individual session program, McIndoo, File, and Preddy (2016) found that it "effectively reduced depression, stress, and rumination at post-treatment, with strong therapist competency and adherence, and treatment gains associated with moderate-strong effect sizes" (p. 126).

The MBCT process begins with psychoeducation to teach the client about mindfulness (Brown, Marquis, & Giuffrida, 2013; Williams & Kuyken, 2012). According to Brown et al. (2012), this includes "the tendencies of the human mind to become preoccupied with thinking about the past, planning for the future, and labeling and making judgments about everyday experiences" (p. 97). Educating clients about mindfulness and their depression teaches them to care for themselves and maintain their own mental health because they know the relationships among thinking, feeling, and mood (Williams & Kuyken, 2012). Sharing research results on the effectiveness of mindfulness with clients is also recommended, especially if the studies are similar to the clients' areas of distress. As of 2012, six randomized control trials showed a 44% decrease in depression relapse when compared with traditional treatments (Williams & Kuyken, 2012). Not only do these conversations normalize what the client is experiencing, but they also give the client hope and ground the therapeutic mindfulness practice in scientific evidence (Brown, Marquis, & Giuffrida, 2013).

The next step in MBCT is to teach the client techniques in mindfulness-based meditation (Brown, Marquis, & Giuffrida, 2013). These techniques are different from traditional cognitive therapies, because after the clients identify ruminating thoughts (Fjorback, Arendt, Ørnbøl, Fink, & Walach, 2011) they are encouraged to accept and experience them instead of the altering them (Williams & Kuyken, 2012). One example is anchoring with breath, which means that when an individual realizes their mind is wandering or they are reacting to thoughts or emotions, they bring their attention back to their breathing. Brown, Marquis, and Giuffrida (2013) and Semple, Reid, and Miller (2005) emphasized the importance of teaching clients techniques that are relevant to their daily lives and that can be easily integrated. Further, clients are taught to notice thoughts, feelings, and body sensations but not to engage in them—"to see more clearly the patterns of the mind, and to recognise when mood is beginning to dip without adding to the problem by falling into analysis and rumination—to stand on the edge of the whirlpool and watch it go round, rather than disappearing into it" (Williams & Kuyken, 2012, p 360).

While much research exists supporting the use of MBSR in both K-12 and college student populations, few studies look at MBCT and students. Three known studies suggest positive potential in children. Semple, Reid, and Miller (2005) found improvements in anxiety in seven- to eight-year-old children; however, their sample size was five. All except for one of the children's teachers reported improved academic functioning or lower anxiety, and it should be noted that the one teacher did not complete the posttest.

Semple, Lee, Rosa, and Miller (2010) developed a children's version of MBCT, called MBCT-C. A 12-week group intervention geared to children's developmental levels, "it teaches mindfulness techniques with the aim of enhancing self-management of attention, promoting decentering, increasing emotional self-regulation, and developing social-emotional resiliency"

(Semple et al., 2010, p. 220). At the end of the program and at a follow-up three months later, children had significantly improved attention when compared with the attention issues they had in the beginning. Finally, Lam (2016) conducted an MBCT pilot study with elementary school students in Hong Kong and found that anxiety symptoms (e.g., panic, generalized anxiety, and obsessive-compulsiveness) decreased significantly.

While many MBCT studies are conducted with clinical populations (Felder, Dimidjian, & Segal, 2012; Fitzpatrick, Simpson, & Smith, 2010; Kuyken, et al., 2010; Segal et al., 2010), a few with undergraduate and graduate student populations do exist. Schwarze and Gerler (2015) ran a five-participant single-subject study with nursing students to see if an MBTC program would reduce stress and increase mindfulness. They found that mindfulness levels improved in all students, though stress levels did not. They suggested that variable baseline stress levels could be due to outside events such as academic and home stress. Collard, Avny, and Boniwell (2008) looked at levels of mindfulness and satisfaction with life in graduate students in a counseling and psychotherapy program and found that MBCT increased mindfulness significantly and that positive affect stayed stable, negative affect decreased, and satisfaction with life was not statistically significant. Taylor, Strauss, Cavanagh, and Jones (2014) developed a self-help version of MBCT and tested it on a group of undergraduate and graduate students. They found "significant reductions in depressive, anxiety and stress symptom severity for intervention participants in comparison to a wait-list control group" (Taylor et al., 2014, p. 67). Gu, Xu, and Zhu (2017) found that college students with ADHD who participated in MBCT showed "lower inattentive symptoms, hyperactivity/impulsivity symptoms, and the ADHD index when compared with [waitlist] participants" (p. 6).

Though the current study is not running a standard MBSR or MBCT program, it is critical to see how these traditional mindfulness programs are run at the college level and that there is evidence that introducing students to mindfulness can improve a variety of issues. The above review of the literature indicates that while the research supports the use of mindfulness in schools, it heavily represents mindfulness programs that separate from the classroom setting instead of running mindfulness in the classroom. Mindfulness practice has been shown to be both preventive and supportive, so allowing access to all students by exposing them to it in the classroom may improve mental health is more students, and not just the ones who are at the point of receiving clinical diagnoses (Messer, Horan, Turner, & Weber, 2016). One of the main problems with these studies, however, is that few address how much or how little training is needed to affect results.

Dosage of Mindfulness

Dosage of mindfulness training is minimally discussed and not well measured in the literature, so it is unknown what the minimal amount of training is that will correlate with positive effects. The first area lacking in dosage research is in MBSR studies. MBSR is an 8-week program with a two-and-a-half hour session per week and a full-day retreat at the end (Horesh, Glick, Taub, Agmon-Levin, & Shoenfeld, 2017; Ramler, Tennison, Lynch, & Murphy, 2016), and having been reduced from the initial 10 weeks, there is little evidence to support that this standard is a critical minimum for effective change. Bergen-Cico, Possemato, and Cheon (2013) ran a brief MBSR program that ran for five weeks with two hours per session for a total of ten hours—almost one-third the time of the standard program. They found significant improvements in self-compassion and non-significant reduction in anxiety, so they suggested that for more serious issues such as anxiety, full MBSR programs are preferable.

The second area lacking dosage research is for non-MBSR programs. A non-MBSR

mindfulness training program by Feicht et al. (2013) ran online for seven-weeks, and participants

were required to complete three exercises once a week for about 10-15 minutes. Subjective

happiness and satisfaction increased significantly. Hartel, Nguyen, and Guzik (2017) ran 3-

minute guided meditations at the beginning of each class meeting for the duration of the course.

Feedback was collected and showed overwhelmingly positive responses. These two studies are

notable for their brief exercises, showing that perhaps even short mindfulness sessions can have

positive outcomes.

A third area lacking empirical evidence is MBCT programming. Like MBSR, standard

MBCT sessions are eight weeks long for two hours each (Fjorback, Arendt, Ørnbøl, Fink, &

Walach, 2011). Also like MBSR, MBCT programs vary in length and duration. For example,

Semple et al. (2010) developed a children's version (MBCT-C) in which they increased meetings

to 12 weeks since "children typically have less developed memory and attentional capacities than

do adults" (p. 222). They reduced the length of technique exercises from 20- to 40-minute blocks

to 3- to 10-minute blocks to accommodate shorter attention spans. They also reduced the number

of group members from 12 to 8 so that the children would get more adult attention. Results

suggested greater attention and lower anxiety in children with ADHD.

Similarly, McIndoo, File, and Preddy (2016) reduced the total number of meetings in

their study to four weeks, with one meeting per week. They further changed their sessions to

individual instead of group meetings. Their findings indicated a reduced recurrence of

depression, stress, and rumination. Collard et al. (2008) implemented the traditional eight-week

program but conjectured that the more time spent practicing mindfulness per week during class,

the higher the mindfulness levels would be. They found that the longer weekly practice time of

mindfulness during the course was significantly associated with a higher level of mindfulness.

Some researchers address dosage directly. Goldberg, Del Re, Hoyt, and Davis (2014)

concluded from their study on practice quality versus practice time that "practice time was a

more reliable and robust predictor of psychological functioning, especially during long-term

follow-up" (p. 295). Meiklejohn et al. (2012) recommended future research to determine "the

amount and types of intervention required for a particular outcome" (p. 304). Baer (2009) found

that increased practice time at home was "significantly correlated with degree of change in

mindfulness, symptoms, and well-being" and, in particular, that participants' self-reported

mindfulness levels in their pre-posttest "mediated the relationships between total practice time

and degree of change in psychological symptoms, perceived stress, and well-being" (p. 16).

Though there seems to be consensus that better outcomes correlate positively with more

quality time spent practicing mindfulness, there is no discussion on what might constitute a

minimum amount of practice to obtain noticeable results. In their meta-analysis on meditation

interventions in schools, Waters et al. (2015) found that effect sizes were generally strongest

when practice was consistent for at least 24 weeks. They called for more random controlled trials

so that samples across studies will match. This way, studies will also match in "programme

duration, frequency of session and type of instructors," which may "help researchers to

determine if different types of meditation are suitable to different contexts, school types, age

groups and student needs" (Waters et al., 2015, p. 128). Length of practice time would also be

more easily studied.

These studies are evidence that there is no conclusive evidence determining what

minimum time spent in mindfulness practice is associated with increased mindfulness and other

known benefits. Few studies actually discuss time and dosage as a potential issue. After a nine-week program for only 80 minutes per session, Lam (2016) suggested that future research should be randomized controlled studies with larger sample sizes "as well as an increased number of weekly sessions so that new learning can be consolidated" (p. 3305). Garland, Zhou, and Gonzales (2016) specifically stated that dosage throughout the literature is unclear and called for future studies to look into it.

Measuring Mindfulness

According to Baer, Smith, Hopkins, Krietemeyer, and Toney (2006), five mindfulness questionnaires existed before they developed the Five-Factor Mindfulness Questionnaire (FFMQ). They were the Mindful Attention Awareness Scale (MAAS; Brown & Ryan, 2003), the Freiburg Mindfulness Inventory (FMI; Buchheld, Grossman, & Walach, 2001), the Kentucky Inventory of Mindfulness Skills (KIMS; Baer, Smith, & Allen, 2004), the Cognitive and Affective Mindfulness Scale (CAMS; Feldman, Hayes, Kuman, Greeson, & Laurenceau, 2007), and the Mindfulness Questionnaire (MQ; Chadwick, Hember, Mead, Lilley, & Dagnan, 2005).

The FFMQ was developed from the MAAS, FMI, KIMS, CAMS, and MQ, because Baer et al. (2006) conducted a confirmatory factor analysis that showed that together they covered five facets of mindfulness: 1) observing, 2) describing, 3) acting with awareness, 4) nonjudging of inner experience and 5) nonreactivity to inner experience. KIMS, developed by Baer, Smith, and Allen (2004), meets four of the five facets (Baer et al., 2006), while the MAAS focuses just on awareness and attention. The FMI just focuses on "nonjudgmental present-moment observation and openness to negative experience (Baer et al., 2006, p. 29; Buchheld, Grossman, & Walach, 2001). The CAMS focuses on "attention, awareness, present-focus, and acceptance/nonjudgment with respect to thoughts and feelings in general daily experience" (Baer et al., 2006, p. 29;

Feldman, Hayes, Kuman, Greeson, & Laurenceau, 2007). The MQ focuses on "a mindful approach to distressing thoughts and images" (Baer et al., 2006, p. 29; Chadwick, Hember, Mead, Lilley, & Dagnan, 2005).

The present study's focus is on the awareness and attention facets of mindfulness, so the MAAS fits best. The MAAS was developed by Brown and Ryan (2003) to measure "the presence or absence of attention to and awareness of what is occurring in the present [moment]" (p. 824). Reudy and Schweizer (2010) describe the MAAS as "[focusing] on attention to and awareness of one's internal and external experience" (p. 77). Prior research had focused on the presence of attributes that are associated with mindfulness, such as acceptance and empathy, instead of present-moment attention and awareness, which Brown and Ryan (2003) believed to be the core of the mindfulness framework. They also believed that although Kabat-Zinn's (1990) definition of mindfulness includes the lack of judgment in attention and awareness, their "conceptualization and measure imply an open receptivity to the present" (Brown & Ryan, 2003, p. 844).

The MAAS is ideal for the present study because it is relatively short with only 15 items. The CAM has 12 and the MQ has 16, but both measure facets of mindfulness outside the scope of the present research, like acceptance/nonjudgment and distressing thoughts, respectively. Both the FFMQ and KIMS have 39 items, and the FMI has 30. The brevity of the MAAS is highly valued because it will be included with additional questionnaires, and class time to complete the questionnaires and informed consent forms is quite limited.

Academic Achievement

A top priority of administrators of institutions of higher education is retention, with particular areas of interest on discovering what high school student characteristics predict first-year college success, what causes attrition, what interventions might prevent attrition, and what campus programs have successfully improved retention rates (Kern, Fagley, & Miller, 1998; Murtaugh, Burns, & Schuster, 1999). Retention is a necessary focus for institutions of higher education because 1) institutions have to use valuable resources to replace students (Jamelske, 2008), 2) there is a financial burden of recruiting replacement students as opposed to keeping current students enrolled (Porter & Swing, 2006), 3) students who do not graduate from an institution are less likely to donate back (Jamelske, 2008), and 4) marketing high retention rates is helpful for recruitment efforts because it helps increase institutional rankings in publications such as the *U.S. News and World Report* (Jamelske, 2006; Porter & Swing, 2006).

Retention and graduation are often the ultimate goals for researching the academic achievement of college students (Braxton & Brier, 1989; Kern, Fagley, & Miller, 1998), and it is well recognized that college GPA is strongly correlated with retention (DeBerard, Spielmans, & Julka, 2004; Pritchard & Wilson, 2003); therefore, this study will measure academic achievement using retention and GPA. While both measures will be covered here, it is still important to know of other variables that have been studied in connection with academic achievement. A review of the literature shows two main categories of studies: those focused on predictive and correlated variables and those focused on specific interventions. Predictive and correlational variables include high school GPA (Robbins, Oh, Le, & Button, 2009); hope, self-efficacy, and optimism (Feldman & Kubota, 2015); academic self-efficacy (Gore, 2006); motivation (Turner, Chandler, & Heffer, 2009); self-regulated learning (Zimmerman, 2002); sleep time (Kelly, Kelly, & Clanton, 2001); and the Scholastic Aptitude Test (SAT; Kobrin,

Patterson, Shaw, Mattern, & Barbuti, 2008). Interventions shown to increase academic achievement include a social-belonging intervention in minority students (Walton & Cohen, 2011), attributional training and restructuring (Perry & Penner, 1990), active learning intervention (Corkin, Horn, & Pattison, 2017), and self-efficacy enhancing interventions (Luzzo, Hasper, Alber, Bibby, Martinelli, Jr., 1999). Though there are intervention studies in GPA and retention research, the majority of studies are predictive and correlational. A purpose of the present study is to add to the intervention literature.

Though closely intertwined in the literature, GPA and retention have been found to be distinct constructs that should be considered separately (Kern, Fagley, & Miller, 1998). The next two subsections will present an overview of both.

GPA

Grading practices run the gamut, whether in high schools (McMillan, 2001) or across majors in colleges (Goldman, Schmidt, Hewitt, & Fisher, 1974). This validity issue creates problems when admitting students to college, since admissions officers look to GPAs as one predictor of success at their college or university. Regardless of this discrepancy, high school GPA has consistently been found to be highly correlated with academic achievement in the first year of college (DeBerard, Spielmans, & Julka, 2004; Hoffman & Lowitzki, 2005).

More specific to the current study, researchers generally agree that college GPA is one of the strongest predictors of retention and that it is highly and consistently correlated with retention (DeBerard, Spielmans, & Julka, 2004; Kern, Fagley, & Miller, 1998). For example, DeBerard et al. (2004) found that first-year GPA is substantially more predictive of retention than high school GPA and SAT scores, with the exception of low high school GPA, which they found to also be a significant predictor of retention. Kern et al. (1998) found that GPA directly affects attrition,

48

while "ACT scores, information processing, selecting main ideas, self-testing, and the composite of motivation, time management, and concentration have indirect effects on attrition through GPA" (p. 30). Naumann, Bandalos, & Gutkin (2003) found that self-regulated learning variables predicted GPA better than the ACT for first-generation college students, whereas the ACT better predicted GPA for second-generation students. Jamelske (2008) found that a first-year experience course had a positive impact on students' GPAs. Alternatively, Plant, Ericsson, Hill, and Asberg (2005) found that study time does not predict college GPA.

While not all tested variables show a positive or causal relationship with GPA (Plant, Ericsson, Hill, & Asberg, 2005), it is important to the current study to note that many findings such as those listed above suggest that GPA can be impacted by other variables. Further, because GPA and retention are strongly correlated, retention may also be impacted by those variables.

Retention

As reported in 2011, "Only 36 percent of all college entrants complete a bachelor's degree within six years and a mere 18 percent complete within four years" (Scott-Clayton, p. 615). Scott-Clayton (2011) calculated this number from the Beginning Postsecondary Students longitudinal study from 1996-2001, written by the National Center for Education Statistics, U.S. Dept. of Education, Office of Educational Research and Improvement. In 2017, Shapiro et al. reported in the National Student Clearinghouse Research Center that "nationally, 54% of students who started in any type of college or university in Fall 2010 completed a degree or certificate within six years," but that "Asian and white students had a much higher completion rate (63.2 percent and 62.0 percent, respectively) than Hispanic and black students (45.8 percent and 38.0 percent, respectively)" (par 1). While there is a large difference between Scott-Clayton's 36% and Shapiro et al.'s (2017) 54%, it may be due to Shapiro et al.'s calculating

those students who transferred schools and then graduated. It is unclear from Scott-Clayton's report of whether he factored in students who transferred, but it is unusual in retention reporting to track students once they leave an institution (Pantages & Creedon, 1978). An additional statistic that is jarring is from the Education Advisory Board (EAB; March 16, 2016, November 1, 2016). They reported that only 10% of low-income, first-generation college students graduate on time (EAB, March 16, 2016). To put this statistic in perspective, first-generation college students make up nearly one-third of the higher education student population (EAB, November 1, 2016).

These statistics are staggeringly low, so it is no wonder that researchers test varying ways to predict who is more likely to persist and to discover what interventions can improve their likelihood of graduating. Tinto (1975) was the first to theorize college student attrition, and his theoretical model of college student retention has been foundational to most retention research that followed (Bishop, 2016). In his theory, Tinto (1975) borrowed Spady's (1970) comparison of dropout behavior to Durkheim's suicide theory. The similarity that Spady (1970) drew was that college is a social system "with its own value and social structures" (p. 91), and when college students with maladjustment and malintegration withdraw, it equates to suicide in the greater society. Students are more likely to continue in college if they integrate well. Integrating well means that they are more satisfied than disappointed from the pre-college expectations they had, which are based on their background, characteristics, and attributes. According to Tinto (1975), these qualities have a direct relationship with retention.

Bean's (1985) causal model of attrition was a response to Tinto's (1975) and Spady's (1970) lack of evidence in making Durkheim's suicide theory the basis of retention theory. Bean (1985) stated that their and others' retention literature lacked theoretical foci, leaving many

questions regarding the reasons for why students leave institutions of higher education prematurely. Bean's (1985) path analysis of "men and women with dropout, institutional commitment, and satisfaction" (p. 173) showed that although satisfaction was a significant determinant in retention for women but not for men, "institutional commitment was far and above the most important variable in predicting dropout" for both men and women (p. 178).

Though Bean's research is valuable to the study of attrition and retention, "Tinto's (1987) model of retention is the most widely acknowledged and useful model in predicting student attrition" (Bishop, 2016, p. 206). Both theories strongly support preparedness and the matching of institutional values to individual values as being primary predictors of retention (Bishop, 2016). Tangible evidence of preparedness is academic performance by way of GPA, "which explains at least half of withdrawals" (Bishop, 2016, p. 208; Pantages & Creedon, 1978). The next most common reasons for dropping out, according to Pantages and Creedon (1978), are financial difficulties; emotional problems; and motivational problems, such as "uncertainty about educational and occupational goals, lack of interest in studies, inability or unwillingness to study, etc." (p. 82). Dissatisfaction with college ranked next after marriage and student or family illness. These findings support Tinto's (1975) and Bean's (1985) findings on satisfaction and retention because students who are having academic, financial, motivation, or emotional problems in college have "changing commitments to the goal of college completion and to the institution in which he is registered" (Tinto, 1975, p. 98; Bean, 1985); therefore, they are dissatisfied with the institution and more likely to dropout.

Based on this foundational retention literature, colleges and universities implement programs to improve commitment to the university, student satisfaction, and academic achievement with programs such as "common reading programs for incoming classes, first-year

seminars, and intensive orientation programs" (Bishop, 2016, p. 206). First-year experience seminars are relevant to the current study. Colleges and universities implement programs such as first-year experience seminars, but research is inconclusive on their effectiveness (Bishop, 2016; Clark & Cundiff, 2011; Jamelske, 2008). Jamelske (2008) did find that the first-year experience class positively impacted retention when the courses not identified as goal compatible were controlled for, meaning that the students in the classes that were focused on retention initiatives were retained at significant rates. Interestingly, this impact on retention for below average students was more notable than for above average students (Jamelske, 2008). Whalen, Saunders, and Shelley (2009-2010) reported that cumulative GPA in the spring semester and learning community membership were predictors of six-year graduation. Jenkins-Guarnieri, Horne, Wallis, Rings, and Vaughan (2015) also found significant retention and academic achievement for students who took their first-year experience course.

Regarding financial difficulties and retention, Webster and Showers (2011) found that financial aid and tuition were positively correlated with retention. Whalen, Saunders, and Shelley (2009-2010) also found that financial need and total financial aid were strong predictors of six-year graduation. They explained that in-state tuition was closely related to retention, because it is usually significantly more affordable than out-of-state tuition.

Motivation has been correlated with retention in terms of a lack of motivation, like unclear educational and career goals, disinterest in studies, and inability or unwillingness to study (Pantages & Creedon, 1978). Kern, Fagley, and Miller (1998) found that motivation was significantly correlated with both attrition and GPA and referenced it as part of Tinto's student retention model. Interventions have also been studied. Allen, Robbins, Casillas, and Oh (2008) looked at third-year retention—a rare population to study—from first-year performance, and they

52

were able to differentiate who transferred and who dropped out. They found that "first-year academic performance strongly differentiates stays from dropouts and, to a lesser degree, differentiates transfers from dropouts" (p. 660). Motivation and social connectedness, they determined, directly impacted whether students stayed or dropped out. An indirect motivation construct was academic self-discipline, which improved the academic performance of first-year students. Solberg Nes, Evens, and Segerstrom (2009) found that motivation and adjustment improved optimism, which improves college retention.

The relationship between emotional issues and retention have been well documented. Hartley (2010) reported that college students with psychiatric disabilities are more likely to drop out of college and that increasing resilience to college stressors can improve retention. Pritchard and Wilson (2003) found that students who intended to stay in school "used more positive coping skills than those intending to drop out" (p. 25). Bishop (2016) found that high risk students (i.e., first-generation, low socioeconomic status, and low high school GPA) who used counseling services dropped out at higher rates than low-risk students who used counseling services. Melnyk, Kelly, Jacobson, Arcoleo, and Shaibi (2014) found that students who took a course that improved physical activity and mental health were retained at higher rates than those who did not take the course.

As this section shows, academic achievement in terms of GPA and retention have been studied extensively and with a broad range of variables. In keeping with Tinto's (1975) model of retention, the present study will focus on students' integration and adjustment to the university through the psychological wellbeing lens. It is hoped that introducing a mindfulness intervention will improve students' GPAs and, therefore, retention—in other words, academic achievement. This next section is a review of the literature on mindfulness and academic achievement.

Effects of Mindfulness on Academic Success

Research shows that metacognitive awareness, a function of mindfulness, is strongly correlated with academic achievement, like GPA (Young & Fry, 2008); however, there is a paucity of studies that look at the effect of mindfulness itself instead of or even in addition to individual mechanisms that make up the theoretical framework of mindfulness. Although few studies have looked at the effects on or relationships among mindfulness and academic achievement, there are key publications that are important to note. Hall (1999) conducted a controlled design in which half the students across two classes were randomly assigned to the meditation or non-meditation groups. At the end of the study, the students in the meditation group had significantly higher cumulative GPAs at the end of the spring semester. Hall (1999) attributed this difference to two possible reasons. First, students who relaxed were better able to learn the information without their usual college- and life-related anxieties. Second, students who meditated when learning the material and then meditated before the test experienced state-dependent learning. State-dependent learning means that "information is better retrieved in the physiological or emotional state in which it was encoded and stored or learned" (Hall, 1999, p. 415). Unfortunately, though Hall (1999) focused on meditation, the details of the intervention were absent.

Other researchers have specifically looked at mindfulness interventions in the classroom. Hartel, Nguyen, and Guzik (2017), as mentioned in the above mindfulness section under "dosage," ran an intervention in which 3-minute guided mindfulness meditations were played at the beginning of each class in a graduate level Library and Information Science course. Haynes, Irvine, and Bridges (2013) wrote about contemplative pedagogy in which Haynes incorporated mindfulness activities into her classes (e.g., bowing, breathing, walking meditation). Although

neither reported data on the impact on or relationship between mindfulness and academic achievement, both Hartel et al. (2017) and Haynes et al. (2013) mention others' findings. They did share, however, anecdotal feedback from students, such as, "[The mindfulness activities] made me feel prepared to learn" (Hartel et al., 2017, p. 114) and "[they] calmed me down and helped me get focused for the actual learning of the material" (Haynes et al., 2013, p. 80).

Although there is minimal research on mindfulness and academic achievement, the amount has increased in the past few years. Shapiro, Brown, and Astin (2011) reviewed the literature on mindfulness in higher education and determined that research on academic achievement and meditation in general "is sparse and suffers from numerous methodological problems, including small samples, inadequately delineated interventions, and other issues" (p. 503). They call for more research in this area. Waters et al. (2015) noted that at the time of their study only three other studies existed on mindfulness and academic achievement. All had been at the elementary, middle, or secondary level—not college. They proposed that because "neuroscience findings suggest that meditation creates elasticity in the regions of the brain that foster emotional regulation," meditating at school might "foster brain changes that enhance emotional regulation [which] supports well-being, social competence and academic achievement" (p. 126).

Though Waters et al. (2015) reviewed the literature on meditation and academic achievement, they did not test it themselves. They did, however, call for further research since the current lack of substantial evidence is insufficient. Neither did Bergen-Cico, Possemato, and Cheon (2013) test for academic achievement in their study on MBSR in the college classroom. They mention that mindfulness training improved "metacognition and attention, which are critical for learning, emotional regulation, and the ability to overcome habitual behaviors" (p.

358), and that this training has been shown to improve academic performance; however, they do not themselves test for it. Hanley, Palejwala, Hanley, Canto, and Garland (2015) also looked at mindfulness and academic performance, but they did so through academic self-efficacy, which has been shown to improve academic performance. Though their findings showed that participants who took part in the mindfulness intervention reported that individuals with "greater mindful awareness and behavior were more likely to engage in positive reappraisal, which partly accounted for their higher academic self-efficacy following the perceived academic failure" (p. 332), Hanley et al. (2015) did not measure academic performance.

Shortly after Waters et al. (2015) mentioned a substantial deficit in the literature on mindfulness and academic achievement, several more studies were published. They are discussed in the next sections in terms of their focus on GPA or retention, and they show positive correlations between mindfulness and academic achievement. Two main issues stand out in the foci of the literature that will be discussed. First, minimal focus is placed on academic achievement and mindfulness in the higher education setting, even though the overall research has increased. Second, the overwhelming focus on mindfulness and academic achievement is on grades, not retention, even though grades and retention are strongly correlated.

Research on mindfulness and academic performance as measured by GPA has increased in recent years, though the findings vary widely and the relationship remains unclear. First, Rosenstreich and Margalit (2015) conducted a study with 73 first-year students at a professional school in Israel, with 25 years as the mean age for the sample. The purpose was to see whether grades would improve after a mindfulness intervention, since mindfulness had previously been shown to decrease the feelings of loneliness, and loneliness had been shown to decrease cognitive abilities. Their findings showed that loneliness did predict lower academic

56

achievement and that "students who participated in the mindfulness workshops were more likely to achieve higher grades than students who did not participate in the workshops" (p. 142).

Second, Sampl, Maran, and Furtner (2017) conducted a randomized controlled pilot intervention with 51 undergraduate students in the intervention group. One of their goals was to test whether a 10-week mindfulness-based self-leadership training had an effect on academic achievement. They found that the combination of mindfulness and self-leadership trainings into one training had "significant improvements in academic performance" (p. 10). Specifically, the intervention group had significantly higher GPAs at the end of the semester when compared to their GPAs in the previous semester. The focus of this study, however, was the combination of mindfulness and leadership, so the impact of mindfulness alone was not analyzed.

Third, López-González, Amutio, Oriol, and Bisquerra (2016) wanted to know if the mindfulness benefits in terms of "personal, family, and school habits" would impact the "classroom climate and academic performance in adolescents" (p. 121), with the variable of classroom climate being related to academic performance. Their sample consisted of 420 high school students in Barcelona, and their findings showed that the students who received the mindfulness intervention had improved mindfulness habits, academic performance, and classroom climate. They reasoned that mindfulness improved information processing skills and allowed the students to concentrate better on academic tasks by stopping chaotic and unconscious thought patterns.

Fourth, McCloskey (2015) reviewed literature on mindfulness, metacognitive awareness, and executive functioning disorders to analyze the role mindfulness interventions may play in helping "students with executive functioning deficits succeed in high-stress academic environments" (p. 221), like college. Though McCloskey (2015) did not specifically look at

GPAs, she was nonetheless interested in the role mindfulness had in improving academic achievement in college students with learning disabilities, especially disorders of executive functioning. Pulling from research that supported improvements in academic, cognitive, and executive functioning, McCloskey (2015) cited evidence that "the benefits of mindfulness on improving self-regulation and perceptions of self-efficacy transfer directly to standard measures of academic success" (p. 224).

Lastly, the study most closely related to the current one is Napora's (2013) research, which looked at meditation in the classroom and its impact on cognitive engagement, mindfulness, and academic performance in an undergraduate population. Mindfulness was the type of meditation used and academic performance was defined as a 4.0-scale GPA. Professors ran a 6-minute pre-recorded mindfulness exercise at the beginning of a 2-hour-and-40-minute class once a week for 15 weeks. The results of the study included finding a relationship between mindfulness and the self-regulation subscale of cognitive engagement. While the author found a relationship between self-regulation and GPA, there was no relationship between mindfulness and GPA, measured either by the FFMQ or the MAAS. The author states that neither Shao and Skarlicki (2009) nor Brausch (2011) found relationships between the MAAS and GPA, which is important to note for the current study. What was found, however, was that the FFMQ subscales of "*nonreacivity* and *acting with awareness* were significantly related to academic performance" (p. 133).

As is evident from these studies, the results showing the relationship between college student retention and GPA is mixed. There is a need for more studies to look at the relationship between GPA and mindfulness interventions to see if interventions could be used to increase college students' GPAs and overall academic success. There is also a need for more studies on

the relationship between mindfulness interventions and higher education retention. Melnyk, Kelly, Jacobson, Arcoleo, and Shaibi (2014) and Fletcher, Newell, and Anderson-Rowland (2007) ran retention-focused programs that included mindfulness, but they did not control other factors to see if mindfulness was a potential reason for any change. Ramler, Tennison, Lynch, and Murphy (2016) address mindfulness' relationship with retention indirectly by looking at mindfulness' relationship with adjustment to university, which greatly impacts retention (Tinto, 1975).

The Melnyk et al. (2014) study looked at the Freshman 5 to Thrive/COPE Healthy Lifestyles course. The purpose of the three-credit course was to "build cognitive behavioral skills to improve mental and physical health outcomes" and to help "students develop the skills and confidence to integrate healthy behaviors into their daily lives" (p. 317). These two purposes, essentially, are the constructs emotion regulation and self-regulation. The course consisted of 15 different weekly topics, and mindfulness was listed in the text as one of the course topic examples but was not included in the week-by-week list in one of the figures. The goal was to see if this course had an impact on the retention of the students who took the course. Melnyk et al. (2014) found that students who took the course returned at a significantly higher rate than students who did not take the course. While this study is helpful in showing the possible impact of increasing students' emotion regulation and self-regulation to improve retention, mindfulness was just one of at least 15 different course topics, or, variables. Frequency at which mindfulness was practiced was not mentioned, so it is unknown whether students practiced it in every class or were introduced to it only once.

Fletcher, Newell, and Anderson-Rowland (2007) wrote about their retention programs designed to improve the retention rate of women in their applied science and engineering

program. It included a student success program, mentoring, an art program, a seminar series, a community service program, and a summer bridge program. Meditation was one of three workshops in the seminar series, with the others being yoga and nutrition. Their retention programs did improve retention steadily over the years, but there is no way of knowing how much impact mindfulness made. While this is an interesting study that shows the success of many programs together, it also shows a lack of data on mindfulness and retention.

The Ramler, Tennison, Lynch, and Murphy (2016) study was of an eight-week MBSR program that was run in two first-year experience classes. The other classes not receiving MBSR training served as the control group. Ramler et al. (2016) found that not only did the mindfulness training improve first-year adjustment—for example, significantly higher personal-emotional adjustment—but it also reduced "physiological stress levels as indexed by salivary cortisol" (p. 185). At the end of the eight-week program, Ramler et al. (2016) found that academic adjustment had not changed significantly for either group, though they acknowledged that the brief time frame may be too short for academic improvements to be noticed or measurable. The only reference to retention in this study was to mention the predictive nature of adjustment to university to student retention. With these studies in mind, there is a large gap in the literature focused on the use of mindfulness in increasing retention efforts at institutions of higher education. These studies show that there is a gap in the literature on mindfulness and academic achievement in higher education that needs attention.

Stress

Stress has been defined as a physiological response to a stimulus, with the stimulus being the stressor (Everly & Sobelman, 1987). Sapolsky (2004) defines this response process in terms of the brain's desire to keep the body in homeostasis, for example, having balanced levels of

oxygen, acidity, and temperature. Sapolsky (2004) wrote, "A *stressor* is anything in the outside world that knocks you out of homeostatic balance, and the *stress-response* is what your body does to reestablish homeostasis" (p. 6). Cohen, Kessler, and Gordon (1995) noted that some experts believe there are too many definitions of stress truly define it, but Cohen et al. (1995) defined it using the three most common types of stress: environmental, psychological, and biological. Their definition of stress is "a process in which environmental demands tax or exceed the adaptive capacity of an organism, resulting in psychological and biological changes that may place persons at risk for disease" (p. 3). This definition fits with the two previous ones in that an outside stimulus occurs and an emotional or physical change happens in response.

Hans Selye was one of the first to explore stress physiology, and, through his research, discovered that the body reacts to many different stressors in the same way. This reaction can result in illness if chronic (Sapolsky, 2004). Because various types of stressors can elicit the same physiological responses, someone who has anxiety-filled thoughts can feel the same way that someone experiencing a stressful event such as being chased may feel (Sapolsky, 2004; Cohen, Kessler, & Gordon, 1995). Cohen et al. (1995) refer to this as emotional stress or psychological disturbances. These stress-inducing thoughts are what are of interest for the present study.

The stress reaction does not just happen in response to the stressor, however. It is the interpretation of the stressor that determines what the response will be. This is called the cognitive appraisal, which is how thoughts can induce stress (Everly & Sobelman, 1987). Once the event—or thought—is determined problematic, then the emotional and physiological responses follow (Ellis, 1987; Everly & Sobelman, 1987). Cohen et al. (1995) add another step at this point in his stress model, suggesting that as part of appraising possible threat, the event or

thought is either experienced as perceived stress or a benign appraisal. If a benign appraisal, then the stress response does not happen; however, if perceived stress is signaled, the stress response continues.

As mentioned in the theoretical framework, automatic thoughts, self-focused attention, and mind wandering can cause cognitive and emotional turmoil, and all have been attributed to negative affect and rumination. When a person ruminates on his or her stressors, those "stressors can incite anxiety and depression, and such reactions to stress can lead to psychological distress (Morrison & O'Connor, 2005). In terms of anxiety, Beck and Clark (1997) explain this information processing perspective as automatic and controlled. Automatic information processing is involuntary, mostly unconscious, too fast to regulate, requires little processing capacity and analysis, and "relies on a parallel type of processing" (p. 50). In terms of depression, Ellis (1987) explains that thoughts in the form of "absolutistic, dogmatic, grandiose thinking is at the very heart of depressive cognition," and he differentiates "appropriate" sadness (e.g., sorrow, regret, frustration, annoyance) from "inappropriate" sadness (e.g., self-condemnation and self-pity; p. 123).

Alternatively, controlled information processing is voluntary, totally conscious, able to be regulated because of its slower pace, requires much processing capacity and analysis, and can process new, "unpracticed tasks with many variable features" (Beck & Clark, 1997, p. 50). This distinction is important to note because when automatic thoughts are ruminated on, meaning they are unable to be checked or regulated, they are strong predictors of stress and anxiety (Morrison & O'Connor, 2005).

Once an event or thought is appraised as a stressor, whether through conscious, top-down stress processing pathways or reactive and unconscious, bottom-up stress processing pathways,

the limbic system is triggered and signals the "activation of the efferent physiologic mechanisms of meditation," which are made up of three axes (Everly & Sobelman, 1987, p. 21). This is the stress response. First, the neurological axis activates the sympathetic nervous system (e.g., increased heart rate and decreased stomach functioning), the parasympathetic nervous system (e.g., constricted pupils, increased saliva production, and bladder wall contractions), and "somatic neural projections to skeletal muscles" (Everly & Sobelman, 1987, p. 21). Second, the neuroendocrine axis activates the adrenal glands, and the response is known as "fight or flight" (Everly & Sobelman, 1987, p. 23). This axis is responsible for bursts of arousal. Third, the endocrine axis is responsible for the release of cortisol, corticosterone, and aldosterone in the adrenal cortex. It "represents the greatest potential for chronic arousal, yet often requires greater intensity of stimulation for significant activation" (Everly & Sobelman, 1987, p. 24).

This brief overview of the stress process shows that stress does not just happen spontaneously. Further, the impact of stress is not just physical health. According to Leppink, Odlaug, Lust, Christenson, and Grant (2016), "Severe levels of stress [in college students] were also associated with increased rates of concurrent psychiatric diagnoses from various diagnostic groups, particularly anxiety and affective disorders" (p. 934). Leppink et al. (2016) reported that these findings are not unique to college students and that "stress predicted increased prevalence rates across numerous disorders, including depression, generalized and social anxiety disorder, obsessive-compulsive disorder, anorexia, substance use disorder, and panic disorder" (p. 934). The next sections will explore how college students experience stress and how mindfulness may be able to attenuate the response.

Stress and College

As is stated in countless studies, "the freshman year represents a stressful transition for college students" (DeBerard et al., 2004; Morrison & O'Connor, 2005), because "emerging adulthood naturally comes with a lot of uncertainty" (Falsafi, 2016). Stress is negatively correlated with life satisfaction in college students (Holinka, 2015; Mahmoud, State, Hall, & Lennie, 2012), and many students experience more stress than they do satisfaction while in college (Lee & Jang, 2015). The sections below provide an overview of the pervasiveness of stress among college students as well as what it is about college and the average college age that often incite such elevated stress.

Prevalence of stress in college. Stress in college is on a fast-paced rise. The Fall 2015 data from the American College Health Association's National College Health Assessment showed that 61.9% of college students experienced overwhelming anxiety within the last 12 months, which increased from 56.1% in 2014 and 51% in 2013. Looking at rumination and stress in college students is crucial because stress is so prevalent (Morrison & O'Connor, 2005) and because rumination and stress have been strongly linked. For example, Morrison and O'Connor (2005) found that rumination and stress "predict changes in anxiety and insomnia, social dysfunction, and depression (p. 455). Further, "change in society and insomnia was consistently predicted by stress irrespective of measurement" (Morrison & O'Connor, 2005, p. 455).

In their study on college student depression, anxiety, and stress, Beiter et al. (2015) reported that their university's counseling center had increased in total number of students seen by 173% in four years. This flood of students is more than the counseling center can see, which is a trend being experienced across colleges and universities (SAMHSA, 2017). It was reported by Gallagher (2014) in the *2014 National Survey of College Counseling Centers* that not only

has there been an increase in the number of students seen, but there had also been an increase since 2009 in the amount of students who present with severe psychological issues, such as anxiety disorders, urgent crises, psychiatric medication issues, clinical depression, learning disabilities, on-campus sexual assault, self-injury issues, and issues from prior sexual abuse. Further, for all individuals who develop a mental illness, seventy-five percent will have experienced the onset by the age of 24 (Kessler et al., 2005). These statistics present a strong case for looking for additional ways to help college students. While it is known that college students experience stress and stress-related illnesses, the next section will discuss what a review of the literature indicates as sources of stress for college students.

Sources of stress in college. It is commonly acknowledged that college students incur much stress in the transition of moving away from home, which means changes in social support, living situations, and academic responsibilities (Leppink, Odlaug, Lust, Christenson, and Grant (2016). While research studies show various reasons for college student stress, there are some common sources that stand out thematically, such as financial and academic stressors.

The top ten college issues that correlated significantly with depression, anxiety, and stress, as reported by Beiter et al. (2015), were "academic performance, pressure to succeed, post-graduation plans, financial concerns, quality of sleep, relationship with friends, relationship with family, overall health, body image, and self-esteem" (p. 93). They also found that transfer students and those students who lived off-campus experienced the most stress. The first four on the list are explained as being college specific, but Beiter et al. (2015) suggests that financial concerns are a combination not just of college's financial cost, but also that students are having to support themselves financially now that they are away from home and have to worry about everyday living costs.

Beiter et al.'s (2015) sources are quite different from those reported on by Ross, Niebling, and Heckert (1999), the first study on the sources of college stress, and Saleh, Camart, and Romo (2017). This large difference may not necessarily be from the different generations of students taking the surveys, but in the surveys themselves. Ross et al. (1999) listed their top five sources of stress as "change in sleeping habits, vacations/breaks, change in eating habits, new responsibilities, and increased workload" (p. 3). While Ross et al. (1999) created the Student Stress Survey, which was the first of its kind, Beiter et al. (2015) created the Depression, Anxiety, and Stress Scale from eight previous study findings on what constitutes sources of student stress. In both studies, the participants rated items on Likert scales. Beiter et al. (2015) had the advantage of referencing others' work to improve the list of items from which students could choose. Saleh et al. (2017) found that both self-esteem and self-efficacy negatively predicted stress, meaning that students low in either construct would be more likely to experience stress. Because the focus of the current study is not on the sources of stress, only two significant causes will be discussed in more depth here. The rest are important to know even in simple list form.

Among the financial burdens that are a significant source of college stress (Beiter et al., 2015; Britt, Ammerman, Barrett, & Jones, 2017), student loans are no exception. Unfortunately, tuition has increased at a much faster rate than have federal and state financial aid awards, and students are under much pressure either to take out student loans and risk being weighed down by massive amounts of debt or working part-time and being unable to focus on their academics—the reason for the degree (Britt et al., 2017). A study done at Ohio State University by Heckman, Lim, and Montalto (2014) showed that 71% of students experienced stress from

personal finances, with the top two being the prospect of high student loan debt upon graduating and a lack of money to fund participating with peers in activities.

Some studies indicate that academics are a predictor of stress among college students (Lee & Jang, 2015; Mahmoud, State, Hall, & Lennie, 2012). Others show a strong negative correlation between the two (Zajacova, Lynch, & Espenshade, 2005), meaning they do not show a causal relationship. The academic adjustment to college is difficult for some students, and those who struggle to adjust have higher chances of dropping out (Gerdes & Mallinckrodt, 1994), as previously discussed. Staats, Cosmar, and Kaffenberger (2007) found that students who did not understand the subject ranked that as being a high source of stress.

Stress and Mindfulness Practice

The study of how the practice of mindfulness can reduce stress, stress-related illnesses, and other issues is well covered, with strong evidence to support that it can (Weinstein, Brown, & Ryan, 2009). For example, mindfulness-based interventions have been used to improve stress-related conditions, like insomnia (Garland, Zhou, Gonzalez, & Rodriguez, 2016). Garland et al. (2016) found that mindfulness training significantly improved sleep by reducing insomnia and sleep disturbance, and they theorized that perhaps the patients experienced relief based on improvements in attention and emotion regulation, both well accepted mechanisms of mindfulness. Another example of mindfulness and stress research is a meta-analysis: Khoury, Sharma, Rush, and Fournier (2015) analyzed 29 MBSR studies, totaling 2,668 participants who were considered healthy. In addition to moderate effects on depression, anxiety, and distress, they found "a large reduction in stress and an increase in the quality of life" (p. 524). Interestingly, they found that healthcare professionals were the group who most benefited from mindfulness training.

Mindfulness alters the stress processing pathways discussed in the section on the overview of stress (Creswell & Lindsay, 2014). Specifically, it improves the "top-down regulatory pathway" (p. 403) which improves functioning of the prefrontal regions. It also reduces the "bottom-up reduced stress reactivity pathway" (p. 403), which reduces unconscious reactivity to potential stressors (p. 403). In other words, mindfulness is about awareness of thoughts and feelings and can help halt rumination (Kiken & Shook, 2014).

All of these findings are a result of adaptive stress processing, which Weinstein, Brown, and Ryan (2009) state are the foundation of psychological well-being. Assisting adaptive stress processing, mindfulness allows the cognitive appraisals of stress to happen, meaning that awareness, consciousness, and attention are involved (Brown & Ryan, 2003). The next section will discuss more studies as they relate to mindfulness and stress in college students.

Stress and mindfulness practice in college. Research on the impact of mindfulness on stress in college is also extensive, and it has been shown that college students like doing it (Haynes, Irvine, & Bridge, 2013). Communicating the benefits of mindfulness increases the likelihood of their intention to participate in the training (Rizer, Fagan, Kilmon, & Rath, 2016). As will be shown in other studies, mindfulness training with college students decreases anxiety and depression (Bamber & Kraenzle Schneider, 2016); however, it has also been shown to reduce anxiety and depression in those who are under academic stress (Cole et al., 2015). This is an important finding, since college students undergo great amounts of stress (DeBerard et al., 2004; Falsafi, 2016; Holinka, 2015; Mahmoud et al., 2012; Morrison & O'Connor, 2005).

Many additional studies have shown that mindfulness reduces stress in college students, and examples follow. An MBSR training conducted with medical students showed a significant increase in mindfulness and a significant decrease in perceived stress, where the significant

changes happened after two weeks for mindfulness and four weeks for stress (Baer, Carmody, & Hunsinger, 2012). Undergraduate students who took an online mindfulness training course showed significant reductions in stress, and, while those who did relaxation training instead also showed significant stress reductions, those in the mindfulness group had improved coping, particularly emotion-focused coping (Messer, Horan, Turner, & Weber, 2016). Further, while mindfulness training may decrease perceived stress, it may also increase positive emotions (Ramasubramanian, 2017).

In a study on biofeedback, mindfulness, and stress in nursing students, Ratanasiripong, Park, Ratanasiripong, and Kathalae (2015) found that even though biofeedback and mindfulness both significantly reduced anxiety, mindfulness also significantly reduced perceived stress levels where biofeedback did not. Shearer, Hunt, Chowdhury, and Nicol (2016) recruited undergraduate students for testing mindfulness training against a control group and a group that interacted with a dog, referred to as an active control group. Shearer et al. (2016) found that state anxiety was significantly lower in both the mindfulness and the active control groups but not the control group; however, during a cognitive challenge where heart rate variability was measured, those in the mindfulness group showed the most variability. The authors attributed this variability to their having "a more-adaptive response to stress" (Shearer et al., 2016, p. 232). Additionally, after giving Japanese undergraduate students the questionnaires Penn State Worry Questionnaire, Problem-Solving Related Meta-Cognitions, and Scale of Meditation-Related Cognitive Styles, Sugiura (2004) found that detached mindfulness reduced worry in terms of decreasing negative appraisal, although persistent thinking was not affected.

As previously stated, mindfulness can also reduce stress-related illnesses. Petterson and Olson (2017) found that mindfulness-based intervention reduced stress and injury in high school

and college athletes. Caldwell, Harrison, Adams, Quin, and Greeson (2010) found that movement-based courses may improve self-regulatory self-efficacy, mood, stress, and sleep quality. Masuda, Anderson, and Sheehan (2009) found that predicted "mental health-related variables and mediated the relationship between self-concealment and emotional distress in stressful interpersonal situations (full mediation) and general psychological ill health (partial mediation)" (p. 115).

In a study run with a mindfulness group, a yoga group, and a control group, Falsafi (2016) found that anxiety, depressive, and stress symptoms all decreased significantly in the mindfulness and yoga groups. The difference between the two intervention groups was that mindfulness self-compassion improved for those practicing mindfulness but not those practicing yoga. Mindfulness has even been shown to be more effective at reducing stress, anxiety, and depression than a group doing physical education and a control group (Gallego, Aguilar-Parra, Cangas, Langer, & Mañas, 2014). In fact, the mindfulness group saw a significant reduction, whereas the physical education group did not.

Halland, et al. (2015) looked at how mindfulness can help psychology and medical students cope with the high stress demands meeting with patients, which often results in mental distress and poor life satisfaction. They found that the group of students who received mindfulness training increased "problem-focused coping" (p. 393), helping them turn what would have been stressful events into challenges that seemed manageable. McIndoo, File, Preddy, Clark, and Hopko (2016) found that stress, depression, rumination, and mindfulness all showed significant improvements at the end of mindfulness-based therapy, with the reduction in depression being clinically significant. Additionally, Korean nursing students who were in an

MBSR group showed significantly decreased levels of depression, anxiety, and stress as well as an increase in mindfulness (Song & Lindquist, 2015).

These studies consistently show that while mindfulness may have similar anxiety and stress reduction effects as compared with other stress management techniques like biofeedback and interactions with animals, mindfulness training goes a step beyond by improving students' ability to cope when confronted with stressful events. Araas (2008) stated that their findings "enhance previous understanding of college freshmen perceptions and behaviors, suggesting that mindfulness programs may improve coping skills, decrease stress levels, and improve health habits for freshmen transitioning into college (Araas, 2008, p. iv).

Stress and academic success in college. A portion of the stress research pertains to the impact stress has on college students' academic success. Because the research on stress and academic success is so intertwined with GPA and retention findings, and because most of the research is on general academic performance, the two will be discussed together in the same section.

Academic stress and academic performance are negatively correlated (Akgun & Ciarrochi, 2003). Students with high levels of stress tend to have lower academic performance than do students with lower levels of stress, with the evidence pointing more stress resulting in the lower performance (Sohail, 2013; Veena, 2016). The research of Schwarze and Gerler (2015) supports previous findings that post-secondary academic demands can increase stress levels, and they attribute the variability of stress scores during their baseline data collection to "academic events, evaluative and anticipatory, occurring at the time of administration of the dependent measures" (p. 49). Rizer, Fagan, Kilmon, and Rath (2015) theorize that "the impact of stress on college students … may be manifested in fatigue, depression, and physical symptoms that can

affect academic achievement and may result in either short- or long-term disease conditions" (p. 24). Crum, Salovey, and Achor (2013) found that a stress mindset enhances the stress response. Stress, then, would seem to have both direct and indirect impacts on academics.

Adjustment to college, which is correlated with stress, has a strong relationship with grades and retention (Nes, Evans, & Segerstrom, 2009). The Spring 2017 American College Health Association's National College Health Assessment (American College Health Association, 2017) shows that out of 31 factors to choose from, students self-reported stress as having the greatest impact on their academic success at 33%. The next highest was anxiety at 26%. Friedlander, Reid, Shupak, and Cribbie (2007) assessed students in their first and second semesters of their first year of college and found that those who had lower stress in the second semester also were better adjusted. Specifically, the students' "decreased stress predicted improved overall, academic, personal-emotional, and social adjustment" (Friedlander et al., 2007, p. 259).

Financial stress has also been shown to have a negative effect on academic success (Joo, Durband, & Grable, 2008). Joo et al. (2008) found that it was more likely for students to work part or full time who took fewer credits or dropped out. Britt et al. (2017) found that financial stress led to increased chances of attrition. Further, dispositional mindfulness was found to predict college adjustment (Mettler, Carsley, Joly, & Heath, 2017).

A particularly vulnerable group of students in terms of college stress are members of the LGBTQ community. Oswalt and Wyatt (2011) found that college students who identified in a sexual minority presented with more mental health issues and stressors, which more strongly impacted their academic performance than that of heterosexual college students. Further, students who identified as bisexual experienced the poorest mental health and most stress than

any other sexual minority group, which, according to Oswalt and Wyatt (2011), supports previous research on bisexual individuals. Other vulnerable groups include immigrant and racial minority students. Zajacova, Lynch, and Espenshade (2005) researched whether academic self-efficacy and perceived college stress together impacted academic success in an immigrant and minority student population. While all three factors were positively related, relevant to this study was their finding that academics and stress correlated negatively. More specifically, they found that 1) students who went to school full time were more likely to persist than students who went part time, 2) stress and GPA correlated negatively but not significantly, and 3) stress "positively, though only marginally, related to persistence" (p. 696). Surprised by these results, Zajacova et al. (2005) conjectured that looking at challenge versus threat appraisals would be an important distinguisher that might show differences in coping mechanisms that correspond to different academic results.

The evidence shows that academic achievement in terms of performance and adjustment is significantly negatively correlated with stress, and some suggest that stress impacts grades and retention (Akgun & Ciarrochi, 2003; Britt et al., 2017; Schwarze & Gerler, 2016). Based on these findings, the current study will look at whether there is a relationship between mindfulness intervention and academic achievement, specifically GPA and retention.

Measuring Stress

Many researchers have attempted to measure stress. None has been quite capable of capturing a measure satisfactory to some critics, since even the definition of stress has been considered both elusive and controversial. This section will explore various measurements and provide an argument for the survey chosen for the present study.

The Undergraduate Stress Questionnaire (USQ; Crandall, Preisler, & Aussprung, 1992) was developed as a way to measure stress as experienced by college students in the hopes that tailoring a questionnaire to a certain population would help the understanding of measuring stress in general. Items on the USQ specific to the college population include *Applying to graduate school*, *Did worse than expected on test*, *Did badly on a test*, and *Having roommate conflicts*. Some of the items are more general, however, and could apply to others outside of this population: *Lack of money*, *Applying for a job*, *Fought with boy-/girlfriend*, and *Someone you expected to call did not*. One of the issues that Crandall et al. (1992) posed for any attempt to measure stress is that the measurement itself can confound the measurement by inflating the taker's view of stress in their lives if the items are negatively phrased to "measure life event stress and the extent to which they tax a subject's ability to meet the needs of the situation" (p. 657).

There are two additional problems with the USQ that have helped make the decision not to use it in the current study. First, the original version is 83 questions long, making it far too long to be combined with the other questionnaires that will be used to measure additional constructs. Even though there is a 10-item version now (Hamer, Tanaka, Okamura, Tsuda, & Steptoe, 2007), the next issue overrides the brevity. Second, in the development of the survey, Crandall et al. had 30 college students list all of the events that caused them stress. While this method provided actual college-related events, the items do not allow those taking the survey to convey whether the events the items reference cause them stress—just that they occurred (Davidson & Beck, 2006). The Academic Stress Scale (Kohn & Frazer, 1986) was developed in much the same way as the USQ and it also has the same issue of stress-occurrence over perception or experiencing of stress as the USQ. Further, it is still too long at 35 items.

The College Chronic Life Stress Survey (CCLSS; Towbes & Cohen, 1996) was developed not only to gauge chronic stress in college students, but to also see the relationship between chronic stress and psychological distress. The focus on chronic stress is important because coping mechanisms can fail after a while, which means appraising events as threatening stressors would be more likely to occur (Towbes & Cohen, 1996). While studying chronic stress is important, it is not quite relevant to the present study, where a focus on chronic stress may overlook experiences of other stress. Furthermore, the CCLSS has 54 items, making it entirely too long for the present study, and, like the USQ and the Academic Stress Scale, it has college-specific items on which participants report frequency of occurrence.

The Survey of Academic Orientations (SAO; Davidson & Beck, 2006) is much closer to being the best measurement for this study. While it addresses college-specific stressors, the items measure for perceived stress, which is important in determining whether the participant actually finds the event stressful and to what extent they experience stress. Length of the SAO is also a problem, unfortunately, because it has 35 items. Were stress the only construct in the present study, the SAO might be used.

Because of its brevity and its ability to measure how participants interpret or appraise potential stressors, the Perceived Stress Scale (PSS; Cohen, Kamarck, & Mermelstein, 1983) will be used in the present study. The 14-item original scale measures the frequency of non-specific events so that the participate can use their own perceptions to respond. Two items, for example, are *In the last month, how often have you been upset because of something that happened unexpectedly?* and *In the last month, how often have you felt that you were unable to control the important things in your life?* (Cohen et al., 1983, p. 395). A unique feature of the PSS compared to life-event scales like the USQ, the CCLSS and the Academic Success Scale is that it has the

participant reflect on the past month instead of six to twelve months. This span of time is important to the present study because students will be asked at three points in the semester to complete the questionnaires. To have them reflect back on more time than a month will possibly include non-relevant events into their responses. For these reasons, the PSS will be used in this study to measure students' stress.

Flourishing

The psychological concept of flourishing came out of positive psychology, which was developed in reaction to the field of psychology's focus on negative affect (Seligman, 2002). Positive psychology, instead of focusing on how to help clients survive, has focused on positive functioning and how to help clients thrive (Schreiner, 2010). Negative affect is considered, too, but instead of looking at it exclusively, the study of happiness and flourishing is embraced (North, Holahan, Carlson, & Pahl, 2014) and human strengths are seen as buffers against possible psychological distress (Seligman, 2002).

The concept of mental health is knit closely to positive psychology and flourishing (Keyes, 2002). The term *mental health* itself means that the individual is mentally healthy or flourishing, but the concept of mental health is a continuum, with flourishing on the optimal end and mental illness or languishing on the other (Keyes, 2002). Positive emotions are a key component to flourishing mental health, since they broaden awareness and allow "individuals to take in more of their surrounding contextual information than they do during neutral or negative states" (Fredrickson, 2013, p. 2). This expanded consciousness allows individuals to build resources, such as cognitive resources like trait mindfulness (Fredrickson, 2013).

The definition of flourishing encompasses other constructs. The definition that most researchers have used to define flourishing is the psychological state when levels of subjective

76

well-being and social-psychological well-being are high, with subjective well-being categorized as hedonic well-being and social and psychological well-being categorized as eudaimonic well-being (Keyes, Shmotkin, & Ryff, 2002; Schotanus-Dijkstra et al., 2016b). Hedonic well-being is understood as day-to-day happiness and is defined "in terms of pleasure attainment and pain avoidance" (Ryan & Deci, 2001, p. 141). Eudaimonic well-being is defined "in terms of the degree to which a person is fully functioning" (Ryan & Deci, 2001, p. 141). Haybron (2008) refers to the eudaimonistic ideal as self-fulfillment or authentic happiness, which are much more than just happiness.

Flourishing can be related to characteristics such as living situation, education, "social support, life events, and physical health" (Schotanus-Dijkstra et al., 2016b, p. 1364). This connection fits well with Ryff's (1989) model of well-being, an attempt to define psychological functioning since well-being had not previously been well defined or theorized. Ryff (1989) created the model from six common characteristics throughout previous literature on psychological well-being: self-acceptance, positive relations with others, autonomy, environmental mastery, purpose in life, and personal growth. Self-acceptance shows up in the literature as the most important measure of well-being and is central to positive psychological functioning (Ryff, 1989). Positive relations with others, which manifests as the ability to give and receive love, is a maturity criterion and central to both adult development and mental health (Ryff, 1989). Autonomy is the independence from concern for what others think and the evaluation of the self in the same way. Environmental mastery is the "individual's ability to choose or create environments suitable to his or her psychic condition," which is "a characteristic of mental health" (Ryff, 1989, p. 1071). Purpose in life means having "goals, intentions, and a sense of direction, all of which contribute to the feeling that life is meaningful" (Ryff, 1989, p.

1071). Personal growth is the continuation of being open to new experiences and challenges instead of reaching a static point. Of this model, Ryff states that "the crux of the present argument is that these goals and directions in life are, in themselves, central criteria of psychological well-being" (Ryff, 1989, p. 1078).

Seligman (2011) defines well-being as a concept under which happiness falls and is not in itself directly measurable. Instead, there are five indicators of well-being: positive emotion, engagement, relationships, meaning, and achievement (PERMA). Including both hedonic and eudaimonic elements of well-being, PERMA supports overall well-being theory—not subjective or psychological; therefore, "well-being, not happiness, is the topic of positive psychology (Seligman, 2011, p. 24). Similarly, Ryff's (1989) model is also more than just happiness, or, hedonic well-being.

Although some of these well-being concepts include hedonic and subjective well-being, the focus of this study will mostly be on eudaimonic well-being, since the purpose is to help college students improve their psychological well-being and "perception of engagement with existential challenges of life" (Keyes, Shmotkin, & Riff, 2002, p. 1007). In terms of definitions throughout the remainder of this literature review, terms will be used as they were used in the original studies. For example, "flourishing" is used in some studies (Keyes et al., 2012) while "psychological well-being" is used in others (Easterlin, 2001) to essentially describe the same concept. Another explanation for this is that "flourishing" is most often used as an adjective and "psychological well-being" as a noun, so the terms are sometimes interchanged simply for their place in sentence structure.

Flourishing and College Students

Flourishing is an important factor to consider with college students, because of the great stressors they face that can jeopardize their success and mental health. Much research has been done to learn more about the impact that psychological well-being—and the lack thereof—has on college students. This section provides an overview of the general research findings on flourishing and college students.

In general, individuals who are mentally healthy are better able to engage in their environment, so college students with mental health are better able to navigate the new school and culture and focus on striving toward their full potential even beyond college (Bowman, 2010). College students with mental illness are much more likely to exhibit suicidal behavior and have academic impairment (Keyes et al., 2012). Those who are flourishing are better able to protect themselves from "the potential pitfalls of risky experimentation (high levels of binge drinking and drug use) and instability (e.g., depression and anxiety) that characterize emerging adulthood" (Nelson & Padilla-Walker, 2013, p. 74). Those in the poorly-adjusted group are much more susceptible (Nelson & Padilla-Walker, 2013). In the Nelson and Padilla-Walker (2013) study, those students who were characterized as internalizers and those who were characterized as poorly adjusted were more often depressed and anxious.

Bowman (2010) found certain pre-college characteristics positively correlated with developing psychological well-being while at college: female, Latinx, those of traditional college age, and those with high academic achievement and aspirations. Those students who gained the most psychological well-being during the first year were female, non-first-generation college students, those older than traditional college students, and those with high academic achievement and aspirations. Bowman (2010) conjectured that students with high academic achievement and

students who intended on pursuing post-baccalaureate degrees were less likely to develop interpersonal relationships. A key finding, then, was that students who had meaningful social interactions fared best. A finding that might be of meaning to the present study is that "interactions with faculty and in-class challenge consistently promote [psychological well-being]" (p. 193), since this study will introduce an intervention designed with the intent to improve psychological well-being.

While Bowman (2010) surveyed participants at two time points, finding that first-year students had decreased well-being by the end of the year, Low (2011) surveyed participants at one time point: during their college orientation. Low (2011) compared their participants' levels of flourishing with that of high school students from Keyes' (2006) study and from the general population. Low (2011) found that the new college students (55.9%) had much higher levels of flourishing than the high school students (37.9%) and the general population (20%), but provided the caveat that the levels were collected as students were beginning the college experience—before the weight of college stressors would be felt. A key finding in the Low (2011) study was that some of the college students were flourishing but they also had depression. This finding of simultaneously flourishing and having depression supported Keyes' (2002) dual continua model, showing that it is possible to be flourishing and to have mental illness (Low, 2011).

College environment seems to have an impact on students' well-being. Fink (2014) found that colleges that provided supportive environments significantly contributed to students' flourishing. Similarly, Davidson, Feldman, and Margalit (2012) found that students whose educational community was supportive and helped them increase their level of engagement and "hopeful thinking may contribute to students' well-being and achievements" (p. 347). Wilson-Strydom and Walker (2015) addressed what it means to incorporate flourishing into education.

80

Through the capabilities approach, which looks at flourishing as a person's ability "to be and do what they have reason to value being and doing" (p. 313), flourishing in higher education means having the ability to gain an education that lets the individual grow and be more of who they can and are supposed to be. Wilson-Strydom and Walker (2015) see higher education as having two roles in the capabilities approach: flourishing *in* higher education and flourishing *through* higher education. *In* means flourishing while in college, like developing skills and making academic and social achievements. *Through* means building graduates who improve well-being outside of the university—who give back to the community from which they came. To Wilson-Strydom and Walker (2015), *through* is the macro-level of flourishing in college students and a moral next step to improving flourishing.

While most of the authors of the previously mentioned studies provided recommendations for using their findings, some specifically recommended programming. DeWitz, Woolsey, and Walsh (2009) found that general self-efficacy significantly predicted purpose in life, so they recommended implementing programs created to increase self-efficacy so that students gain greater purpose in life. Keyes et al. (2012), after finding that students with greater mental health have fewer suicidal tendencies and academic issues, concluded that increasing students' mental health will help protect them from both suicidal behavior and academic impairment (Keyes et al., 2012). They recommend intervention research. Fink (2014) suggested programing that would help students feel supported, like living-learning communities, to aid in the college transition process. These calls for flourishing interventions support the need for the present intervention study.

Flourishing and Mindfulness

Until Brown and Ryan's (2003) study on mindfulness and psychological well-being, there had not been much work done (Feicht et al., 2013). Since then, findings abound as researchers have been conducting studies that look not just at the relationships between mindfulness and psychological well-being, but also at what might be mediating that relationship as well as what elements of psychological well-being are impacted. The first set of examples in this section shows how researchers have looked to interventions to show this relationship, while the second set shows research on trait mindfulness in non-meditators.

Mindfulness and flourishing intervention studies are plentiful. Feicht et al. (2013) conducted a "seven-week web-based happiness training to improve psychological well-being, reduce stress, and enhance mindfulness and flourishing" (p. 1). They wanted to see if the happiness training would improve positive emotions through attention regulation. Findings showed that participants had significantly increased happiness and satisfaction, though there was no significant change in attention regulation. Feicht et al. (2013) proposed that this lack of change was due to the training exercises, which, although "fall within the scope of mindfulness" (p. 11), may need to be based more on mindfulness in order to have an impact on attention regulation.

Bohlmeijer, Lamers, and Fledderus (2015) shared an important finding on the impact that mindfulness has on mental health: not only can it alleviate depression, but it can also improve flourishing and quality of life. Their intervention was Acceptance and Commitment Therapy (ACT), referenced earlier as one of the four mainstream mindfulness-based therapies and "defined as a distinctive model of behavioral and cognitive therapy with a strong focus on the context of behavior" (Bohlmeijer et al., 2015, p. 103). Bohlmeijer et al. (2015) found that their

ACT intervention increased flourishing levels in people with depressive symptoms because it increased their psychological flexibility—their ability to be mindful and accept current situations or experiences. In the beginning of the study, only 5% of their participants with depressive symptoms were flourishing. After the ACT intervention, 28% were flourishing. This means that the mindfulness-based ACT program did not just reduce depression—it helped individuals with depression "to live a pleasant, meaningful, and engaged life" (Bohlmeijer et al., 2015, p. 104).

Trait mindfulness has been tested without intervention to see what relationship it has with constructs such as psychological well-being and life satisfaction. The next few paragraphs describe mindfulness and flourishing studies that have not included interventions. Vela, Lu, Lenz, Savage, and Guardiola (2016) found similar results to Bohlmeijer et al. (2015) in a sample of Mexican American college students, though they used different variables. Researching the constructs of hope, mindfulness, grit, and presence of and search for meaning in life, they found that higher levels of mindfulness predicted lower levels of depression and higher levels of life satisfaction, while higher levels of searching for the meaning of life predicted higher levels of depression. Perhaps these relationships are because searching for meaning of life might equate to a higher tendency towards rumination, which can be psychologically unhealthy (Moberly & Watkins, 2008, p. 314; Mor & Winquist, 2002; Wood, et al., 1990). The finding that being accepting of present experiences as seen in Bohlmeijer et al.'s (2015) and Vela et al.'s (2016) studies is also seen in North, Holahan, Carlson, and Pahl's (2014) study on failure and flourishing. North et al. (2014) found that their participants who could accept the negative feelings associated with their failure and then move forward towards a new goal had much better levels of flourishing and happiness and fewer symptoms of depression.

Kong, Want, and Zhao (2014) also looked at the relationship between mindfulness and life satisfaction and found that it was a significant predictor. Their results supported others' findings that mindfulness and life satisfaction are strongly correlated (Brown & Ryan, 2003). Further, they found that the relationship is directly mediated by core self-evaluations, which are self-esteem, self-efficacy, locus of control, and emotional stability. This means that attending to and being aware of "one's own worthiness, effectiveness, and capability" improve one's satisfaction with their life (p. 166). Similarly, Shier and Graham (2011) found that a reflective component of mindfulness practiced by social workers helped improve their subjective well-being. They also found that practicing mindfulness improved social workers' subjective well-being by improving their awareness of the present moment. Though some of the participants practiced mindfulness, they were chosen to be part of the qualitative study based on their high levels of subjective well-being. They were evaluated on their state of mindfulness, but not necessarily on whether they practiced it.

Hollis-Walker and Colosimo (2011) looked at the relationship among mindfulness and self-compassion, psychological well-being, and the Big Five Personality Traits, which they refer to as happiness indices: agreeableness, extraversion, openness, conscientiousness, and extraversion. They found that those who were high in mindfulness were also high in all variables except for neuroticism. Hollis-Walker and Colosimo (2011) state that the importance of their study is that they determined that "mindfulness is not only related to well-being, but is a measurable quality possessed even by those who do not practice mindfulness meditation" (p. 226).

Akin and Akin (2015) found that coping competence, mindfulness, and flourishing are all positively correlated with each other; that flourishing increases with improved mindfulness; and

that coping competence mediates mindfulness' impact on flourishing. A key point is that while mindfulness affects flourishing, it also affects flourishing through another variable (e.g., coping confidence); therefore, mindfulness can increase flourishing both directly and indirectly. This point is made again in Xu, Oei, Liu, Want, and Ding's (2016) study on self-acceptance and tolerance of others. Xu et al. (2016) found that self-acceptance mediates mindfulness and subjective well-being, while tolerance of others moderates them. This means that "high self-acceptance is a critical factor in the relationship between mindfulness and [subjective well-being]" and that tolerance's impact on mindfulness and psychological well-being depends on its level. For example, "for individuals with low tolerance, mindfulness is significantly positively correlated to [subjective well-being]. For individuals with high tolerance, however, there is a less significant relationship between mindfulness and [subjective well-being]" (p. 1453). Xu et al.'s (2016) explanation for weaker relationship being that individuals who are already tolerant of others already experience high levels of subjective well-being, thereby being less sensitive to increases in mindfulness.

The combination of these intervention and evaluative studies provides further evidence that the increase in mindfulness is what is having a positive impact on flourishing and that mindfulness interventions that improve mindfulness can improve psychological well-being and life satisfaction. Such evidence supports using a mindfulness intervention for the present study.

Flourishing and Stress

As discussed in the above section on flourishing, mental health is considered a continuum, with flourishing meaning being mentally healthy and having positive feelings, and languishing meaning having mental illness and negative feelings (Keyes, 2002). As discussed in the section on stress, stress has many negative health effects that are physiological (Sapolsky,

2004) and emotional (Cohen et al., 1995), as well as emotional consequences including depression and anxiety (Morrison & O'Connor, 2005). At the very least, depression, anxiety, and stress are highly significantly correlated (Mahmoud, Staten, Hall, & Lenni, 2012). Because stress and mindfulness are negatively correlated (Brown & Ryan, 2003; Palmer & Rodger, 2009), it is no surprise that studies show that stress is also negatively correlated with life satisfaction (Holinka, 2015; Mahmoud et al., 2012) and emotional well-being (Mahmoud et al., 2012; Weinstein, Brown, & Ryan, 2009).

The course of life is filled with stress, and those who are resilient "use positive emotion to alleviate stress effects [and] show physiological differences in their ability to adapt to stress" (Otto, Howerter, Bell, & Jackson, 2010, p. 365). Individuals who are flourishing have much higher positive affect than those who are languishing (Ong, Bergeman, Bisconti, & Wallace, 2006; Otto et al., 2010). Flourishers are more resilient and recover more easily from daily stressors (Ong, Bergeman, Bisconti, & Wallace, 2006), and languishers are much less defensive or resilient to stress (Otto et al., 2010). Further, those who are languishing are more psychologically vulnerable or susceptible to experiencing stress and are more at risk for stress' adverse physiological and emotional effects (Ingram & Price, 2010; Ingram, Miranda, & Segal, 1998; Uysal, 2015). Uysal (2015) found that their participants who were flourishing also had high social competence and low psychological vulnerability, with flourishing mediating social competence's reduction of psychological vulnerability.

Resilience means flourishing even through "contexts of significant life challenge and adversity" (Ryff & Singer, 2003, p. 15). Beginning college fits this description. College students who reported experiencing lower stress also reported significantly higher life satisfaction than do the students who report higher stress (Holinka, 2015). It is possible to moderate this impact of

stress on life satisfaction, however, as shown by Civitci (2015), who found that the more college students sensed that they belonged at their school and in their major, the more life satisfaction and less perceived stress they had.

It is important to note that this evidence that well-being is a continuum on which flourishing individuals are more likely to have mental health and languishing individuals, being more susceptible to stressors, are more likely to experience mental illness. This evidence supports the need for interventions to help college students, who are developmentally and environmentally more susceptible to stress, to increase their capability of having and using positive emotions to improve not just their mental health but also their life satisfaction.

Flourishing and Academic Achievement

Flourishing and academic achievement in terms of GPA and retention are strongly related (Datu, 2016; Schreiner, Pothoven, Nelson, & McIntosh, 2006), and the order of influence depends on the situation. For example, mental health has been shown to predict GPA and retention (Eisenberg, Golberstein, & Hunt, 2009). Alternatively, academic, interpersonal, and social stressors can impact overall stress and student satisfaction (Lee & Jang, 2015), which is a predictor of retention (Bean, 1985). Further, Nes, Evans, and Segerstrom (2009) found that "dispositional optimism predicted retention through motivation and adjustment, which in turn predicted retention. Academic optimism, on the other hand, predicted retention through its effect on GPA, motivation, and adjustment" (Nes, Evans, & Segerstrom, 2009, p. 1887).

The research shows a clear relationship between flourishing and GPA. In a study with Filipino undergraduate and high school students, flourishing, defined as "social-psychological prosperity," positively predicted both self-reported and objective measures of academic achievement (Datu, 2016, p. 10). In a study specific to college students, college students who

87

were flourishing "were less likely to adopt an entity view of ability or to procrastinate and were more likely to endorse mastery-approach goals, to report high self-control, and to report high grades" (Howell, 2009, p. 1). In another study, college students who had meaningful interpersonal connections, whose outlook on life was positive, and who felt that they made a difference earned higher grades and learned more overall. These positive impacts did not depend on demographics or academic ability (Schreiner, 2010).

When measuring flourishing in college students, it is important to assess flourishing in the students' environment, which Coffey, Wray-Lake, Mashek, and Branand (2016) describe as a "rigorous academic setting" (p. 206). Coffey et al. (2016) found that the PERMA components of well-being, which are flourishing predictors, were positively correlated with current, but not future, GPA. Bowman (2010) found that "openness to diversity and challenge" (p. 277) were significantly positively correlated with GPA for first-year college students.

Like mindfulness and retention, there is little research on direct relationships between flourishing and retention; however, some studies look at variables that are themselves closely linked with retention, providing clues that flourishing and retention are connected. For example, the Datu (2016) study that showed an association between flourishing and self-reported grades also showed a strong relationship between flourishing and "greater behavioral and emotional engagement in an educational context" (p. 10). The social-psychological prosperity definition of flourishing "is characterized by greater competence, purpose in life, self-esteem, optimism, and harmonious relationships" (p. 10), which, along with academic engagement, are associated with college adjustment, which is associated with retention (Robbins, Oh, Le, & Button, 2009; Tinto, 1975).

Another flourishing variable impacting retention is life satisfaction, as previously mentioned. It improves the chances of student retention, as do peer support and social life (Bean, 1983). Self-efficacy and purpose in life are also strongly correlated with persistence (DeWitz, Woolsey, & Walsh, 2009). The lesson from these studies, according to Schreiner (2010), is to help students thrive or flourish in order to do well academically.

Measuring Flourishing

Because there are two different approaches to wellbeing (i.e., hedonic and eudaimonic), measuring it has been difficult (Ryan and Deci, 2001). The Flourishing Scale (FS; Diener et al., 2010) is an eight-item scale that focuses solely on eudaimonic well-being, which, as previously mentioned, is "important for positive functioning, such as competence, self-acceptance, meaning and relatedness, as well as optimism, giving, and engagement, which studies have shown to contribute to wellbeing" (Hone, Jarden, & Schofield, 2014, p. 1034). Hedonic well-being is more of the day-to-day level of happiness (Fredrickson, 2013), so the present study will focus on measurements that assess eudaimonic well-being. Eudaimonic well-being includes "important aspects of human functioning: competence, engagement and interest, meaning and purpose, optimism, self-acceptance, supportive and rewarding relationships, contribution to the well-being of others, and being respected" (Sumi, 2014, p. 603).

An assessment that measures both approaches to well-being is the Mental Health Continuum Short Form (MHC-SF; Keyes, 2009). The MHC-SF has 14 items that measure emotional well-being (hedonic well-being) and positive functioning (eudaimonic well-being), with psychological well-being and social well-being making up positive functioning (Keyes et al., 2012). Though short enough to successfully be integrated into the current study's other

assessments, the current study is not interested in hedonic well-being since it is more sensitive to changes with mood.

An exclusively hedonic well-being measurement is the Scale for Positive and Negative Experience (SPANE; Diener et al., 2010). The SPANE is a 12-item brief scale that lists a wide spectrum of emotions as the items (i.e., positive, negative, good, bad, pleasant, unpleasant, happy, sad, afraid, joyful, angry, and contented), with answers indicating the frequency of experiencing each emotion on a Likert scale from one (*very rarely or never*) to five (*very often or always*). The benefit of this type of scale is that emotions, not specific situations or circumstances, are listed, and the individual is asked to think of the frequency that each emotion was felt over the past four weeks instead of at that moment, making the responses less sensitive to current mood (Diener et al., 2010). Level of well-being is determined by the ratio of positive and negative emotions. Diener et al. (2010) stated that while "the SPANE performed well in terms of reliability and convergent validity with other measures of emotion, well-being, happiness, and life satisfaction" (p. 153), it does not measure flourishing. Instead, it measures positive and negative emotions (Howell & Buro, 2015). For the present study, therefore, the FS will be used. Literature discussing mindfulness intervention dosages was covered in the section on how mindfulness is used in counseling.

Conclusion: Mindfulness, Academic Achievement, Stress, and Flourishing

This chapter was a review of the literature of mindfulness, academic achievement, stress, and flourishing. The literature on mindfulness described the historical background and the contemporary definition, and helped explore a theoretical framework. A review of mindfulness across fields showed its presence in medicine, business, education, and counseling. The areas of education and counseling related most to the present study. Academic achievement for college

students was operationally defined as GPA and retention, and literature on the relationship among them and mindfulness was discussed. Stress was defined and reviewed in terms of its prevalence and sources in college and in its relationship with mindfulness practice and academic achievement in college. Flourishing was defined and reviewed in terms of its impact on college students and its relationships between mindfulness, academic achievement, and stress.

This literature review shows several gaps in the literature. There have been studies covering the relationships among mindfulness, attention, and awareness (Kabat-Zinn, 2013; Mrazek, Franklin, Phillips, Baird, & Schooler, 2013) and stress (Brown & Ryan, 2003; Palmer & Rodger, 2009), flourishing (Bohlmeijer et al., 2015; Feicht et al., 2013), GPA, and retention (Datu, 2016). There have been studies on the relationships between stress and flourishing (Ingram & Price, 2010; Ingram et al., 1998; Otto et al., 2010) and GPA and retention (Akgun & Ciarrochi, 2003; Britt et al., 2017; Schwarze & Gerler, 2016; Zajacova et al., 2005). There have also been studies on the relationships among flourishing, GPA, and retention (Datu, 2016); however, there are no studies to date with all of these variables, particularly in a first-year college student population. Data on mindfulness and first-year college student retention is particularly lacking.

College students today are experiencing more stress and psychological distress than ever before (ACHA, 2015; SAMHSA, 2017). These emotional disturbances cause problems like anxiety and depression (Morrison & O'Connor, 2005) and can hinder students' academic achievement, making students at greater risk for lower GPAs and dropping out (Akgun & Ciarrochi, 2003; Sohail, 2013; Veena, 2016). Programs aimed at helping students calm their minds have been shown to decrease stress (Creswell & Lindsay, 2014; Kiken and Shook, 2014) and increase flourishing (Feicht et al., 2013). Mindfulness training, in particular, has helped

students learn metacognition, or to pay attention to paying attention (Black & Fernando, 2014; Napoli, Krech, & Holley, 2005). When they are able to stop ruminating and getting swept away in their automatic thoughts (Troop-Gordon, Rudolph, Sugimura, & Little, 2015), they can increase their well-being (Kang, Gruber, & Gray, 2013).

With this research that supports the positive impact mindfulness training can have on college students, the goal of the present study is to introduce mindfulness to first-year college students. Since beginning college is stressful, with many environmental and social changes and new responsibilities, it is hoped that learning mindfulness techniques will not just mitigate the impact of stressors, but will also improve their mindfulness, flourishing, and academic achievement. This goal is particularly important since academic achievement in the first semester and year of college is predictive of graduation.

Chapter Three

Research Methodology

This study was a repeated measures quasi-experimental nonequivalent control group design. The research methodology is presented in this chapter and includes the participants, measures, research design, limitations, and ethical considerations. Background information will be given to support the need for the proposed study, and implications will be discussed to show how the results can be used in future studies and programs.

This study used secondary data that was gathered from a mindfulness intervention conducted in the Fall 2016 semester by nine members of various departments at a large state university. The author of this dissertation worked at this university and was the primary investigator for the intervention. All members of the team were critical to the planning, implementation, and data collection for the intervention. Even though the data from the intervention was not published or fully analyzed, the present study, which is using the secondary data, will be referred to as "the current study" for the sake of clarity in distinguishing it from the original data collection. For the current study, the author hypothesized that there would be relationships among GPA, retention, and the pretest levels of mindfulness, stress, and flourishing. GPA was measured at the end ocf the year and retention was measured at the beginning of the sophomore year. The author also hypothesized that posttest mindfulness, stress, and flourishing levels; end-of-semester and end-of-year GPA; and sophomore retention would differ for the group that received the mindfulness intervention versus the group that did not.

Measures

The dataset that the author of the current study used included the following measures discussed in this section. The research team gave students in both groups informed consent forms (see Appendix A for the mindfulness intervention and Appendix B for the comparison group) and assessments (see Appendix C for the pretest and Appendix D for the posstest) at two times in the UNIV 101 class during the course of the semester. The assessments consisted of demographic questions, the Mindful Attention Awareness Scale (MAAS; Brown & Ryan, 2003), the Perceived Stress Scale (PSS; Cohen, Kamarck, & Mermelstein, 1983), the Flourishing Scale (FS; Diener et al., 2010), and an instructor survey (see Appendix E for the instructor survey). The pretest was given on the first day of class immediately after the informed consent forms were collected. The posttest was given at the beginning of the twelfth class meeting, which was calculated as the final data collection point because the second week was when the mindfulness intervention began and the eleventh week was when the tenth mindfulness session was run. The twelfth week, therefore, was the week after the tenth mindfulness session.

The dataset from the intervention study also included GPA and retention data for each student who completed the informed consent form, completed the pretests and posttests, and provided a valid student identification number. The GPA data consisted of Fall 2016 GPAs, Spring 2017 GPAs, and cumulative GPAs at the end of Spring 2017. Retention data included whether the students were enrolled in classes in the Fall 2017.

Demographics Questionnaire. The pretest included a demographic section with questions on class section, class instructor, gender, sex, race/ethnicity, and previous mindfulness and meditation knowledge and practice. The posttest included questions asking how often the

students meditated both in and out of the class and their desire to and likelihood of practicing mindfulness after the course had ended. Both assessments included the following questionnaires.

Mindful Attention Awareness Scale (MAAS). The MAAS (Brown & Ryan, 2003) is a 15-item questionnaire with a 6-point Likert scale ranging from 1 (*almost always*) to 6 (*almost never*), and the higher the score, the higher the level of mindfulness. It was created to measure mindfulness in individuals who had no "meditation training experience" (Sampl, Maran, & Furtnery, 2017, p. 7). Mindfulness is measured in terms of consciousness, or, attention and awareness (Brown & Ryan, 2003). In line with Kabat-Zinn's (2013) definition of mindfulness, Sampl et al. (2017) stated that the MAAS measures "present moment awareness" (p. 7).

The creation of the MAAS began with a possible 184 items, and then Brown and Ryan (2003) reduced the number of items by excluding the ones that measured attitude (e.g., trust) and motivation (e.g., the reason for being aware or holding attention). To increase construct validity, experts reviewed and rated the remaining items using the exclusion criteria, and Brown and Ryan (2003) excluded the ones not rated as highly adequate. From these items, Brown and Ryan (2003) conducted an exploratory factor analysis. Fifteen items remained, including, *I could be experiencing some emotion and not be conscious of it until some time later*, *I forget a person's name almost as soon as I've been told it for the first time*, and *I find myself preoccupied with the future or the past*.

The confirmatory factor analysis verified the single-factor model shown by the exploratory factor analysis, so there are no subscales. The confirmatory factor analysis conducted with college students and adults showed internal consistency alphas of .82 and .87, respectively, so this scale is appropriate to use with college students. Many other studies have confirmed this single-factor finding as well as internal reliabilities ranging from .87 to .89 (MacKillop &

Anderson, 2007; Van Dam, Earleywine, & Border, 2010; Weinstein, Brown, & Ryan, 2009).

These findings supported the use of the MAAS for measuring mindfulness in college students.

Perceived Stress Scale (PSS). The PSS was created by Cohen et al. (1983) to measure "the degree to which situations in one's life are appraised as stressful" (p. 385) in the past month. Previous measures assessed life events, but Cohen et al. (1983) found the PSS to be more predictive of stress than assessments based on life events because participants could report how stressed they felt instead of being given an objective score that may not represent their actual their stress levels.

The PSS was first validated with two samples of college students and a smoking cessation group. It is a 14-item questionnaire with a 5-point scale ranging from 0 (*never*) to 4 (*very often*). Half of the items require reverse scoring before summing the total score, which represents the degree to which the test taker believes his or her life to be stressful. Cohen et al. (1983) found good reliability over the three samples (α =.84, .85, and .86, respectively), with two-day test-retest periods for the student samples and a six-week period for the smoking cessation sample. Validity was determined through correlating the PSS scores with the number of life events. Correlations were "small to moderate" (p. 390) but larger when taking into account how the life events were perceived. Validity was also determined by comparing the scores to those of a depression scale, in which the PSS was shown to be measuring a different construct than depression.

Other studies have verified the reliability and validity of the PSS. In looking at stress as a predictor of first-year college student adjustment, Friedlander, Reid, Shupak, & Cribbie (2007) found internal consistencies for the PSS of α = .87 and .88 for first and second semesters, respectively. In a study on stress in nursing students, Ratanasiripong, Park, Ratanasiripong, and

Kathalae (2015) found internal reliabilities of $\alpha = .89$ for the pretest and $\alpha = .92$ for the posttest. The reliability, validity, and successful use of the measure with college students supported the use of the PSS in the intervention study and the use of the collected data in the current study.

Flourishing Scale (FS). The FS (Diener et al., 2010) measures eudaimonic well-being, also known as psychological and social well-being. It is a brief 8-item measure that includes items on social relationships, having a life of purpose and meaning, engagement and interest in activities, self-respect and optimism, and feelings of competence and ability in meaningful activities. Like the PSS, the FS is based on the respondent's subjective perspective.

The FS scale ranges from 1 (*strongly disagree*) to 7 (*strongly agree*), and the final score is the sum of all scores, with higher scores indicating higher levels of flourishing. Diener et al. (2010) conducted a principal factor analysis which showed a single factor, so there are no subscales. They also found good reliability at $\alpha = .87$. Construct validity was determined through convergence with similar scales and discrimination from scales measuring different constructs.

Other studies support Diener et al.'s (2010) validity and reliability findings. In a study on flourishing in high achieving and engaged Filipino high school and college students, Datu (2016) obtained a reliability of $\alpha = .85$ in the high school student sample and $\alpha = .87$ in the university student sample. The Dutch FS was validated by Schotanus-Dijstra et al. (2016a) with a sample of participants with moderate to low well-being and obtained a reliability of $\alpha = .87$. The measure was found to lean towards positive well-being since the sample scored only slightly lower than samples of the general population; therefore, Schotanus-Dijstra et al. (2016a) suggested that the FS be used in conjunction with hedonic well-being assessments in intervention studies that looked at well-being as a measure of mental health. Howell & Buro (2015) also found a good internal consistency at $\alpha = .89$, along with Hone, Jarden, & Schofield (2013), who found an

internal consistency of $\alpha = .91$ and convergent and discriminant validity with similar and dissimilar measures. This evidence of reliability, validity, and use with college students supported the use of the FS in the intervention study and the use of the collected data in the current study.

Instructor survey. At the end of the intervention, instructors received an electronic survey through their e-mail. The survey asked questions regarding the frequency of the mindfulness exercises and class participation during the exercises. This survey was simply to gather information on whether the intervention was conducted as planned since members of the research team were not in the classes to observe it. The survey results were referenced in the current study during the preliminary analysis when the author cleaned the data in order to make sure that the data being used represented the planned intervention.

Procedures

This section will explore the procedures for both the intervention study and the current study. The intervention was conducted by the research team in which the current author was the lead investigator and took place in the the Fall of 2016.

Intervention Study Procedures

In the Fall of 2016, 21 instructors at a large public research university taught a total of 44 sections of UNIV 101. Fourteen of the 21 instructors volunteered to provide the mindfulness intervention to their classes. The number of mindfulness sections totaled 27. The intervention was to play a mindfulness exercise at the beginning of each class meeting for ten weeks. UNIV 101 met for one hour once a week. The mindfulness exercises were two- to five-minute pre-recorded guided meditations that were a combination of breath awareness, body scans, and sitting meditations, which align with Kabat-Zinn's (2013) mindfulness exercises (see Appendix

F). The guided meditations came from YouTube and emphasized the elements essential to mindfulness: paying attention to the present moment and gently guiding back attention when the mind has wandered.

The members of the research team designed the mindfulness intervention curriculum and went into each section's first day of class to read and collect the informed consent, to administer the first assessments, and, in the classes that were to receive the mindfulness intervention, to present the PowerPoint introduction to mindfulness (see Appendix G). The presentation explained what mindfulness is, the science behind it, and the physical and emotional benefits of practicing it, as evidenced by research (Brown & Ryan, 2003; Kabat-Zinn, 2013). At the beginning of classes during the twelfth week, which was the week after the tenth and final week of the intervention, the research team returned to read and collect the informed consent and administer the posttest. Instructors were surveyed after the final assessment in order to gather information on frequency that they actually played the exercises in class and whether all students stayed quiet regardless of participation in the mindfulness exercise.

Participants. The current study used the dataset from the mindfulness intervention study of all the students who completed the pretest and posttest and who accurately provided their student identification number. There were 809 first-year college students enrolled in Virginia Commonwealth University's first-year experience seminar Introduction to the University (UNIV 101) in the Fall of 2016. Only about one quarter of first-year students take UNIV 101, which is not a required course. Because they elect to take it and choose a section from those taught by their advisor, they are not randomly selected; therefore, this sample can only truly represent the population of first-year VCU students who choose to take UNIV 101. The research team for the intervention recruited students in their classrooms on the first day of class by explaining 1) the

intervention, 2) that students were not at all required to participate, and 3) that participation or non-participation would not impact their grade in the course.

Not all 809 students participated in the intervention or completed the assessments. For example, some students were not yet 18, some were not in class on the first day to complete the first informed consent form and pretest, and some chose not to participate. Some of those who participated did not indicate their correct student ID and therefore did not have matching pretests, posttests, GPA, or retention status. Of the total of 809 students who were enrolled across the UNIV 101 sections, 441 successfully completed the in-class paper pretest and posttest, with 299 in the mindfulness group and 142 in the comparison group. This was 54.5% of the possible sample.

Recruitment and Group Assignment. The research team did not recruit students, nor were the students able to self-select into an intervention or non-intervention section. The team made sure that students were not aware of the mindfulness intervention when they were deciding whether or not to take the course, so it was not a factor in their decision to enroll. Registration for this class took place during summer orientation, and, although it was optional, many advisors strongly encouraged each student to take it; therefore, some students may have interpreted the message to mean that it was mandatory, while others chose to take it to improve their chances of a smoother adjustment to college.

The research team gave all instructors of UNIV 101 the option to join the intervention group and complete training on implementing the mindfulness activities in their course sections. Instructors who participated were asked to follow the intervention procedures in all sections of their course. All instructors, regardless of whether they participated in the intervention, were asked by the research team to allow a team member to come into their classroom three times

during the semester to administer the surveys. The instructors who administered the intervention were neither participants nor research team members. They simply added the activities to their curriculum.

Current Study Procedures

For the current study, the author submitted an IRB request to analyze the dataset collected by the mindfulness intervention research team. The dataset was secondary data looking at the latent variables mindfulness, stress, and flourishing levels in students who took a first-year experience course in the Fall of 2016 and who either received or did not receive a brief mindfulness intervention. The dataset also included GPA and retention data from the registrar's office. For the current study, the author requested IRB permission to use this data to answer the current research questions. The author also requested permission to reference the instructor survey in order to gauge the extent to which the instructors met the intervention study research team's expectations for conducting the intervention. When permission was obtained, the author moved forward with the analyses.

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Research Design

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This study was a repeated measures quasi-experimental nonequivalent control group design. It was experimental because the mindfulness intervention was the manipulated independent variable, but it was not fully experimental because there was no random assignment (Goodwin, 1998). Because there was no random assignment, the groups could not be considered equal; therefore, the groups were nonequivalent even though the group not receiving the intervention is being used as the control (Goodwin, 1998).

The research team could not randomly assign participants into groups for several reasons. First, instructors of UNIV 101 could not be told to implement the intervention, so they were

asked to volunteer. Those who chose to run mindfulness in their classes were in the comparison group, and those who chose not to run mindfulness were in the control group. More instructors chose to participate than not. Second, students could not be randomly assigned into the sections because they had to take it with the instructor who was also their academic advisor. Students could only choose among the different times that their instructors were teaching.

Because none of the questions were open-ended and no students were interviewed or observed, this study was entirely quantitative. Specifically, participants answered the demographic questions from a list of options and the three latent variable questions (mindfulness, perceived stress, and emotional well-being) from Likert-type scales. GPA and retention data were collected from the university's registrar's office.

The research questions and their respective hypotheses for this proposed study were as follow:

R_1: What are the relationships among the pretest latent variables mindfulness, stress, and flourishing and the manifest variables GPA and retention in first-year college students in a first-year experience seminar?

H_{1a}: As pretest mindfulness levels increase, pretest flourishing levels will increase and pretest stress levels will decrease.

H_{1b}: GPA will increase as pretest mindfulness and flourishing increase, and GPA will decrease as pretest stress increases.

H_{1c}: As GPA increases, retention odds will increase.

H_{1d}: Retention odds will increase as pretest mindfulness and flourishing increase, and retention odds will decrease as pretest stress increases.

R_2: Will there be differences in mindfulness, stress, flourishing, GPA, and retention between groups of students in a first-year experience seminar who received a brief mindfulness intervention and groups of students who were also in a first-year seminar but who did not receive the intervention?

H_{2a}: There will be significant increases in mindfulness and flourishing in the group of students in a first-year experience seminar who received a brief mindfulness intervention and not in the group of students in a first-year experience seminar who did not receive the intervention.

H_{2b}: There will be a significant decrease in stress in the group of students in a first-year experience seminar who received a brief mindfulness intervention and not in the group of students in a first-year experience seminar who did not receive the intervention.

H_{2c}: There will be significantly higher GPAs in the group of students in a first-year experience seminar who received a brief mindfulness intervention and not in the group of students in a first-year experience seminar who did not receive the intervention.

H_{2d}: There will be significantly higher retention in the group of students in a first-year experience seminar who received a brief mindfulness intervention and not in the group of students in a first-year experience seminar who did not receive the intervention.

Preliminary Analysis

The data were entered into SPSS by undergraduate research assistants. Before running the model, the author cleaned the data, checked for multivariate outliers, and tested for group

variances. Cleaning the data involved removing any participants who did not complete both the

pretest and the posttest and who did not have data for GPA or retention. Not having data meant

that the student had not written the correct identification number, which often also resulted in not

having a matching pretest and posttest. Data that were missing randomly were simply replaced

with -999 and labeled as missing.

To analyze the multivariate outliers, change score variables were created by subtracting

the pretest variables from the posttest variables. Cook's Distance was run for each of the latent

variable change scores. The cutoff number to determine outliers was calculated by dividing the

sample size into the number four (UCLA, nd). Everything above that number was considered an

outlier. Once the outliers were removed, the author ran descriptive statistics for the

demographics. Cronbach's alphas were then run to check the assessment scores' reliability, and

correlations were run to check the strength and directions of the constructs' relationships.

Invariances between groups needed to be evaluated since this study used data collected

from intervention and comparison groups, and because there was no random assignment. Chi-

square tests for the demographic variables were used to determine whether the two groups varied

significantly. Chi-square tests were used because the demographic variables were categorical. As

stated in the previous section, gender varied significantly and was therefore accounted for in the

MLM for the second research question.

Statistical Analyses

To answer the first research question, the author ran a bivariate Pearson's correlation

between each latent variable pair (i.e., mindfulness and flourishing, mindfulness and stress, and

flourishing and stress), a simple regression analysis for each latent variable with each GPA time

point (i.e., Fall, Spring, and cumulative), and a logistic regression for each latent variable with

retention, which was binary—students either returned for the following Fall semester or they did not. To answer the second question, the author ran intra-class correlations (ICC) for each latent and observed variable to see whether the class sections contained variances. If any of the outcome variables varied across class section, then a multilevel model (MLM) was run to control for those variances. Because each GPA time point showed variations across class sections, an MLM was run for each of the outcome variables. As will be discussed in the next section, gender varied significantly between the mindfulness and comparison groups; therefore, gender was also controlled for in the MLM. The purpose of the MLM that was run for each of the outcome variables was to see if there was any significant differences between the group that received the mindfulness exercises and the group that did not.

Ethical Considerations

The current study used secondary data to answer the aforementioned research questions. This section includes the ethical considerations for both the current study as well as the intervention study, since the intervention study's data were used in the current study. The university's Institutional Review Board (IRB) approved use of the dataset from the original study to answer this study's research questions, since the questions were the same. The Registrar's office granted permission to use the students' GPA and retention data. The dataset that the author requested to used did not have any identifiable information; the student identification numbers had been replaced with random digits.

For the intervention study, the research team obtained permission from the IRB to run the intervention. Ethical concerns included the coercion to participate and the collection of identifiable information. To prevent students from feeling coerced to participate in the intervention study, the research team made sure that an alternate team member administered

assessments to a class that was taught by a member of the research team. To further prevent students from feeling pressured to participate, the research team made it clear in the informed consent that participating or not participating in any part of the intervention or assessments would not impact the students' grades—positively or negatively. Students were told that they could pretend to complete the informed consent and assessments so that it would seem as if they were participating, but that instead of signing their name or including their ID number, they could write "not participating."

Collecting identifiable information on the assessments was the other major ethical consideration of the intervention study. Instead of putting their names, therefore, they were asked to put down their student identification number. This still being identifiable information, students were told in the informed consent that once data were collected and GPA and enrollment data were matched, their identification numbers would be replaced with random digits so that their information would no longer be identifiable. The informed consent forms made it clear that the the collected data might be used for research and that it was IRB approved.

Conclusion

This study determined whether there was a relationship between a 10-week mindfulness intervention in which two- to five-minute mindfulness meditations once a week in a first-year experience seminar had relationships with mindfulness, stress, flourishing, GPA, and retention. It also determined whether those outcome variables were related to one another. The results are outlined in chapter four and discussed in chapter five.

There is currently minimal research on the relationships among mindfulness meditations, flourishing, and retention, so the current study will provide this information to the existing literature. Colleges and universities are continuously looking for ways to increase retention

(Clark & Cundiff, 2011), so discovering whether mindfulness meditations or flourishing levels correlate significantly with retaining first-year students into the next year could be useful in curriculum and program designs. It is hoped that in adding to the literature, future studies will be conducted to see if similar interventions can be administered in other types of college classes to decrease stress and improve mindfulness, flourishing, and academic achievement in terms of GPA and retention.

Chapter Four

Data Analysis

Chapter four presents the results of a 10-week mindfulness intervention in first-year experience classes in a large public university. The intervention was conducted at the beginning of classes for 2-5 minutes once a week. One of the goals of the study was to see if there were relationships between the intervention and students' levels of mindfulness, stress, flourishing, GPA, and retention. This chapter begins with a description of the preliminary analysis, including how the author addressed missing data and outliers. The chapter then describes the demographic characteristics of the remaining sample, and discusses testing for variances at the class section level. The remainder of this chapter presents the results of the statistical analyses, and chapter five presents the interpretations. The research questions are as follow:

R_1: What are the relationships among the pretest latent variables mindfulness, stress, and flourishing and the manifest variables GPA and retention in first-year college students in a first-year experience seminar?

R_2: Will there be differences in mindfulness, stress, flourishing, GPA, and retention between groups of students in a first-year experience seminar who received a brief mindfulness intervention and groups of students who were also in a first-year seminar but who did not receive the intervention?

Preliminary Analysis

Four-hundred and forty-one first-year college students who were enrolled in UNIV 101 successfully completed the pretest and posttest. Of these students, 391 were in sections in which the instructors indicated that the mindfulness activities were run at the beginning of each class. Three instructors indicated that they did not run the activities each week in at least one of their sections, so all 50 students who were in those specified sections were removed from the sample.

Before analyzing the sample's demographics, the author addressed the missing data and removed multivariate outliers. Missing values were replaced with -999 and labeled in SPSS. Mean scores for items in each scale were calculated instead of the sum or average in order to compensate for the missing data that would have negatively impacted the sum or average. To prepare the data before locating multivariate outliers, the author calculated change scores for each variable by subtracting the pretest mean scores from the posttest mean scores. The resulting differences created the variables that the author used to check for outliers. Next, the author ran a Cook's Distance test for each of these change scores, creating new scores from which to identify outliers. As shown in Table 1, neither the pretest nor the posttest have a Cook's Distance at or above one, which is the conservative method for determining outliers or values that influence the regression curve (Cook & Weisberg, 1982; Stevens, 1984). The more conventional method of setting a cutoff is $4/n$ (UCLA, nd), or in this case 4/391. Using this formula, the Cook's Distance cutoff for the pretest variables was 0.01023. Thirteen participants qualified as outliers. A review of the histogram of Cook's Distance showed that these 13 outliers were indeed separate from the rest of the sample, so the author removed them from the analysis. Six were in the comparison group and seven were in the treatment group.

Cook's Distance for the posttest change variables was run after removing the outliers from the pretest change variables, so the 4/n calculation was determined by the new sample size, or 4/378, which equaled .01058. This cutoff indicated there were 17 posttest multivariate outliers. Before removing all 17, which was a large number of participants, the author looked at the spread of Cook's Distance on a histogram. Only five participants were clearly separate from the others, so those were the only ones that the author removed. Four of the participants were from the treatment group and one was from the comparison group.

Table 1

Cook's Distance for Multivariate Outliers

Test	Minimum	Maximum	Mean	*SD*	*N*
Pretest	.00	.02	.00	.00	391
Posttest	.00	.05	.00	.00	378

Participants

After removing the outliers, there were 248 students remaining in the mindfulness sections and 125 remaining in the comparison sections. The mindfulness students made up 66.5% of the sample size and the comparison group made up the other 33.5%. The remaining 18 instructors taught a total of 35 class sections, with responses per section ranging from 3 to 27. Women made up 70% (n = 261) of the sample and males made up 30% (n = 112). The sample was relatively diverse, as shown in Table 2.

Table 2

Race and Ethnicity of Sample as Compared to Institution at Time of Data Collection

Race/ethnicity	*N*	% of Sample	% at Institution
White	148	39.7	44.2
Black	99	26.5	19.8
Hispanic or Latino/a	17	4.6	9.0
Asian or Pacific Islander	36	9.7	14.1
American Indian, Alaskan Native, Native Hawaiian	2	.5	.3
Biracial or Multiracial	64	17.2	6.6
Other race	6	1.6	—
No response	1	.3	—

Note. The institution did not report "other race" or "no response," but reported 3.3% as "unknown," leaving 2.7% unaccounted for.

Testing for Group Variances

Because neither the participants nor the instructors were randomized into the treatment and comparison groups, the two groups cannot be considered equal. It is still crucial, however, to test for the variances within the demographics and the pretest items and scales in order to learn about the extent to which the groups differ in terms of these measures. Tables 3 and 4 show the chi squared tests of independence results for the demographics and prior experiences with mindfulness or mindfulness-related activities. As these comparisons show, the only significant difference between the treatment and comparison groups was gender, with the mindfulness group made up of significantly more women than the comparison group. All other demographic categories as well as prior experiences with mindfulness or mindfulness-related activities differed insignificantly.

Table 3

Chi Squared Tests of Independence of Demographics Per Group and Combined Categories

		Group				
		Mindfulness		Comparison		
Demographics		*N*	*%*	*N*	*%*	*p*
Gender	Female	187	75.4	74	59.2	.01**
	Male	61	24.6	51	40.8	
Race/ Ethnicity	White	93	37.7	55	44.0	.36
	Black	67	27.1	32	25.6	
	Hispanic, Latino/a, or Other	19	7.7	4	3.2	
	Asian or Pacific Islander	26	10.5	10	8.0	
	Biracial, multiracial, or American Indian, Alaskan Native, Native Hawaiian	42	17.0	24	19.2	

Note. Categories were combined so that at least 80% of cells could have frequencies greater than 5. There were zero American Indian, Alaskan Native, and Native Hawaiians in the mindfulness group and two in the comparison group. There were four in "other" in the mindfulness group and two in the comparison group.
**$p < .01$.

Table 4

Chi Squared Tests of Independence of Prior Mindfulness-Type Practice

		Group				
		Mindfulness		Comparison		
Prior experience		*N*	*%*	*N*	*%*	*p*
Read or watched something about mindfulness?	Yes	88	35.5	50	40.0	.26
	No	115	45.4	47	37.6	
	Unsure	45	18.1	28	22.4	
Been taught Mindfulness meditation	Yes	58	23.4	28	22.4	.17
	No	162	65.3	74	59.2	
	Unsure	28	11.3	23	18.4	

Table 4 Continued

Prior experience		Mindfulness		Comparison		
		N	%	N	%	p
Participated in mindfulness exercises	Yes	75	30.4	37	29.6	.10
	No	141	57.1	62	49.6	
	Unsure	31	12.6	26	20.8	
How often practice mindfulness exercises or meditation?	Daily	8	3.2	5	4.0	.93
	Several times a week	5	2.0	4	3.2	
	Once a week	10	4.0	6	4.8	
	Once a month	9	3.6	5	4.0	
	Rarely	68	27.5	37	29.8	
	Never	147	59.5	67	54.0	
How often participate in prayer?	Daily	55	22.3	30	24.2	.13
	Several times a week	46	18.6	17	13.7	
	Once a week	29	11.7	8	6.5	
	Once a month	16	6.5	8	6.5	
	Rarely	63	25.5	29	23.4	
	Never	38	15.4	32	25.8	
How often participate in mindful spiritual practice?	Several times a week	10	4.0	4	3.2	.17
	Once a week	18	7.3	11	8.9	
	Once a month	15	6.1	5	4.0	
	Rarely	53	21.5	42	33.9	
	Never	144	58.3	59	47.6	
How often practice yoga?	At least once a week[a]	21	8.5	5	4.0	.23
	Once a month	13	5.3	10	8.1	
	Rarely	59	24.0	25	20.2	
	Never	153	62.2	84	67.7	

[a]*Daily*, *several times a week*, and *once a week* were combined so that cell frequencies would equal or exceed the minimum expectation of five.

The next step was to analyze the differences between the two groups' pretest mean scale scores. The purpose of this step was to make sure that the groups did not differ significantly in terms of mindfulness (MAAS), stress, (PSS), or flourishing (FS). If they differed significantly, then it would not be possible to compare changes on the posttest. Table 5 shows the descriptive statistics for both groups, and Table 6 shows the independent samples t-tests that compared mean scale scores of the two groups' pretests. The Levene's Test for the MAAS t-test was significant, so t, degrees of freedom, and significance were determined by equal variances not assumed. Levene's Tests for the other two variables were not significant, so t, degrees of freedom, and significance were determined by equal variances assumed. None of the mean scale scores for any of the variables varied significantly between the mindfulness and comparison groups.

Table 5

Pretest Means and Standard Deviations Between Groups

Source	Group Status	N	M	SD	SE
MAAS	Mindfulness	248	4.02	.81	.05
	Comparison	125	4.02	.72	.06
PSS	Mindfulness	248	1.86	.54	.03
	Comparison	125	1.83	.53	.05
FS	Mindfulness	248	5.97	.73	.05
	Comparison	125	5.86	.76	.07

Note. MAAS = Mindful Attention Awareness Scale, PSS = Perceived Stress Scale, and FS = Flourishing Scale

Table 6

Independent Samples t-Tests for Comparison of Pretest Scores Between Groups

| | Levene's Test | | t-Test for Equality of Means | | |
	F	p	t	df	p
MAAS	3.91	.05*	-.04	276.35	.97
PSS	.25	.62	.40	371	.69
FS	.57	.45	1.33	371	.18

*p < .05

Reliability of Scale Scores

The next step of the preliminary data analysis was to run reliability tests for all the pretest

and posttest scales to determine means and Cronbach's coefficients alpha. As shown in Table 7,

all scales in the pretest and posttest were well above .8. Values above .7 are considered

respectable in psychological constructs (Field, 2013). It is notable that Cronbach's coefficients

alpha levels are all higher in the posttests than in their respective pretests.

Table 7

Reliability of Scale Scores

Scale	Cronbach's coefficients alpha	M (Items)	M (Scale)	N (Items)
MAAS Pretest	.87	4.02	60.27	15
MAAS Posttest	.90	3.87	58.05	15
PSS Pretest	.82	1.85	25.93	14
PSS Posttest	.85	1.98	27.66	14
FS Pretest	.85	5.93	47.46	8
FS Posttest	.91	5.85	46.80	8

Note. MAAS = Mindful Attention Awareness Scale, PSS = Perceived Stress Scale, and FS = Flourishing Scale

Research Question One

The first research question examined the relationships among the outcome variables. Specifically, the author wanted to see how 1) the latent variables mindfulness, stress, and flourishing correlated with each other, 2) whether the latent variables predicted the observed variables GPA and retention, and 3) whether GPA predicted retention. Descriptive statistics for the pre-test latent variables and the observed variables are in Table 8.

Table 8

Descriptive Statistics for Pretest Latent Variables and Observed Variables

Variable	N	M	SD	SE
Pretest mindfulness	373	4.02	.78	.04
Pretest stress	373	1.85	.53	.03
Pretest flourishing	373	5.93	.74	.04
Fall GPA	372	2.93	.78	.04
Spring GPA	352	2.81	.93	.05
Cumulative GPA	352	2.93	.69	.04
Retention	371	1.20	.40	.02

In 2012, Cohen and Janicki-Deverts conducted a national survey measuring stress with a sample that represented the "general population based on region, sex, age, and household income data from the 2000 U.S. Census" (p. 1322). Table 9 shows the mean sum results of the PSS-10 compared with the mean sum results from the current study. In calculating the mean sums from the current study, only the items that appear on the PSS-10 were used from the PSS-14 that was used for the current study.

116

Table 9

Comparison of PSS Scores from U.S. Sample and Study Sample

Gender	M (U.S. Norm[a])	M Current Study
Women	16.14	19.44
Men	15.52	16.02

[a]Mean sum scores from Cohen and Janicki-Deverts (2012)

To test the relationships among the latent variables, the author ran bivariate Pearson's correlations using the pretest scores for students in both groups. As Table 10 shows, all latent variables correlated significantly with each other. Specifically, mindfulness and perceived stress correlated negatively, mindfulness and flourishing correlated positively, and perceived stress and flourishing correlated negatively. Flourishing has a weak to moderate relationship with mindfulness, while perceived stress has moderate relationships with mindfulness and flourishing.

Table 10

Bivariate Pearson's Correlations Among Latent Variables

	1	2
Mindfulness		
Perceived Stress	-.54**	
Flourishing	.36**	-.51**

**$p < .01$

To investigate the relationships between each latent variable and each collection of GPA (i.e., Fall, Spring, and cumulative), the author conducted simple regression analyses. Table 11 shows the results of the model that suggests that only flourishing and Spring GPA had a significant and positive predictive relationship, meaning that as flourishing increases, so does the Spring GPA. The model explained 2.1% of the total variance in the data ($R^2 = .021$). The F-value of 7.54 ($p < .01$) suggests that the model has significant predictive power. No other latent variables showed relationships with any of the GPA collection points.

117

Table 11

Simple Regression Analyses of Pretest Latent Variables Predicting GPA

Variable	Fall GPA				Spring GPA				Cumulative GPA			
	β	t	F	R^2	β	t	F	R^2	B	T	F	R^2
Pretest mindfulness	-.01	-.24	.06	.00	.07	9.78	1.22	.00	.02	.46	.21	.00
Pretest stress	-.02	-.29	.08	.00	-.13	-1.36	1.84	.01	-.03	-.39	.15	.00
Pretest flourishing	-.02	-.35	.12	.00	.18**	2.75	7.54	.02	.03	.69	.47	.00

**p < .01

To test the relationships among each latent variable and retention as well as GPA and retention, a logistic equation was required due to retention being binary: students were either enrolled in the following Fall semester or they were not. Table 12 shows the results. Mindfulness had an odds ratio of 1.24, meaning that the odds of returning for the following Fall semester increased by 1.24 times as mindfulness increased, the model was not significant. Even though the Hosmer and Lemeshow test ($x^2 = 9.06$, $df = 8$) was not significant ($p = .34$) and the percentage of correctly classified observations was 79.5, mindfulness was not a significant predictor of retention (Wald = 1.67, $df = 1$, $p = .20$). Next, stress was also found to be an insignificant predictor of retention (Wald = .03, $df = 1$, $p = .86$), even though the model appeared to fit the data at 79.5 percent correctly classified observations and a significant Hosmer and Lemeshow test ($x^2 = 16.32$, $df = 8$, $p = .04$). Similarly, flourishing was found to be an insignificant predictor of retention (Wald = 1.34, $df = 1$, $p = .25$), even though the model appeared to fit the data at 79.5 percent correctly classified observations and a non-significant Hosmer and Lemeshow test ($x^2 = 15.09$, $df = 7$, $p = .06$).

Logistic regression analyses were also run for the different time points of GPA to investigate their predictive relationship with retention. First, Fall GPA was found to be a statistically significant predictor of enrollment at the same institution the next Fall semester (Wald = 10.30, df = 1, p = .00). The odds ratio for Fall GPA suggests that as grades increase, students have odds of returning at 1.67 times; however, both Cox & Snell (R^2 = .03) and Nagelkerke (R^2 = .04) suggest a weak effect size for the overall model, which explains 2.7 percent and 4.3 percent of data variances, respectively. Second, Spring GPA was also a statistically significant predictor of enrollment the next Fall semester (Wald = 16.27, df = 1, p < .00), with an odds ratio that suggests as Spring GPA increases, the likelihood of returning to the same institution the following Fall semester increases by 1.81 times. Both Cox & Snell (R^2 = .05) and Nagelkerke (R^2 = .08) suggest a weak effect size for the overall model, which explains 4.5 percent and 7.7 percent of data variances, respectively. Finally, cumulative GPA was also found to be a statistically significant predictor of retention into the fall semester, with an odds ratio that suggests that as the cumulative GPA from fall and spring semesters increases, then retention into the fall semester increases by 1.64 times. Both Cox & Snell (R^2 = .02) and Nagelkerke (R^2 = .03) suggest a weak effect size for the overall model, which explains 1.6 percent and 2.8 percent of data variances, respectively.

Table 12

Logistic Regression Analyses of Pretest Latent Variables and GPAs Predicting Retention

Independent Variable	Retention					
	x^2	*B*	*SE*	e^{β}	R^2	% Correct
Pretest mindfulness	1.67	.21	.17	1.24	.00	79.5
Pretest stress	.029	.04	.24	1.04	.00	79.5
Pretest flourishing	1.32	. 20	.17	1.22	.00	79.5
Fall GPA	10.27**	.51	.16	1.67**	.04	79.5
Spring GPA	16.23**	.60	.15	1.81**	.08	84
Cumulative GPA	5.74*	.49	.21	1.64*	.03	84

Note. Nagelkerke was used for R^2.
* < .05, **p < .01

While the pretest latent variables did not indicate any significant relationships with GPA or retention, some of the latent variables measured by the posttest did. Tables 13 and 14 show the posttest latent variables mindfulness, stress, and flourishing and their simple regression analyses with each GPA time point. Both posttest mindfulness and posttest stress showed significant predictive relationships with Fall, Spring, and cumulative GPA. Mindfulness measured from the posttest had significant positive predictive relationships with all GPA time points, and stress measured from the posttest had significant negative predictive relationships with all GPA time points. Flourishing, however, only showed a significant predictive relationship with Spring GPA, and it was positive. As shown in Table 15, the only posttest latent variable that had a positive predictive relationship with retention was flourishing.

Table 13

Simple Regression Analyses of Posttest Latent Variables Predicting Fall and Spring GPA

	Fall GPA				Spring GPA			
Variable	β	t	F	R^2	β	t	F	R^2
Posttest mindfulness	.11	2.32*	5.38*	.01	.13	10.37*	5.84*	.02
Posttest Stress	-.28	-4.01***	16.07***	.04	-.26**	-2.99**	8.96**	.03
Posttest flourishing	.05	1.06	.29	.00	.19***	3.56***	12.67***	.04

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

Table 14

Simple Regression Analyses of Posttest Latent Variables Predicting Cumulative GPAs

	Cumulative GPA			
Independent Variable	β	t	F	R^2
Posttest mindfulness	.10	2.34*	5.48*	.02
Posttest stress	-.21	-3.18**	10.13**	.03
Posttest flourishing	.06	1.57	2.45	.00

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

Table 15

Logistic Regression Analyses of Posttest Latent Variables and GPA Predicting Retention

	Retention					
Variable	X^2	β	SE	e^{β}	R^2	% Correct
Posttest mindfulness	.59	.11	.15	1.12	.00	79.5
Posttest stress	.06	-.06	.23	.94	.00	79.5
Posttest flourishing	7.73**	.36	.13	1.44	.03	79.5

***p < .001

Research Question Two

The second research question investigated the differences in the outcome variables of mindfulness, stress, flourishing, GPA, and retention between the treatment and comparison groups. Because the participants were enrolled in 35 different class sections, there existed the possibility of needing to analyze the data in terms of nested data. Class sections were a more preferable nesting option to the class instructor because each instructor taught multiple sections. Variances may exist among classes taught by the same instructor, so variations among class sections were explored. Significant variances among sections would impact the analysis chosen to answer the second research question. If sections varied in change scores for mindfulness, perceived stress, or flourishing, then a multi-level model would need to be conducted to see whether some classes and not others had significant changes as a result of the mindfulness intervention. If sections did not vary significantly, then repeated-measure ANOVAs could be conducted to determine whether the changes in the treatment or comparison groups were significant.

To determine variances across class sections, the author calculated intra class correlations, with results shown in Table 16. The latent variables mindfulness, stress, and flourishing, as well as the observed variable retention, did not vary significantly across sections; however, the observed variables Fall, Spring, and cumulative GPAs did. Whereas the percentages of variances between sections for mindfulness, stress, flourishing, and retention are 1.08, 2.35, 0, and .05, respectively, and the percentages of variances between sections for Fall, Spring, and cumulative GPAs are 6.97, 7.22, and 6.97, respectively.

Table 16

Intra-Class Correlations for Outcome Variables

Dependent Variable	N	M	SD	SE	ICC
MAAS Change	373	-.16	.70	.04	.02
PSS Change	373	.12	.49	.03	.03
FS Change	373	-.08	.68	.04	.00
Fall GPA	372	2.94	.78	.04	.07[a]
Spring GPA	352	2.81	.93	.05	.07[a]
Cumulative GPA	352	2.94	.69	.04	.37[a]
Retention	371	1.21	.40	.02	.01

[a]Non-significant ICC values above .05 indicated variances among class sections

Because there were variances among class sections for all time points of GPA, GPA required a multilevel analysis. Further, as shown earlier in Table 3, gender varied significantly between the mindfulness and comparison groups ($p < .01$); therefore, the author ran multilevel analyses for all outcome variables with gender as the level one variable and class section as the level two variable.

As the results show in Tables 17 and 18, when controlling for class section, neither students' gender ($b = .03$, S.E. $= .08$, $p = .71$) nor the mindfulness intervention ($b = .-.01$, S.E. $= .09$, $p = .88$) significantly predicted students' levels of mindfulness; neither students' gender ($b = .02$, S.E. $= .06$, $p = .69$) nor the mindfulness intervention ($b = -.02$, S.E. $= .06$, $p = .84$) significantly predicted students' stress levels; neither students' gender ($b = -.02$, S.E. $= .08$, $p = .72$) nor the mindfulness intervention ($b = -.11$, S.E. $= .08$, $p = .13$) significantly predicted students' flourishing levels; and neither students' gender ($b = -.00$, S.E. $= .05$, $p = .94$) nor the mindfulness intervention ($b = .01$, S.E. $= .05$, $p = .85$) predicted students' retention.

For GPA, which showed variances across the class section level, neither students' gender ($b = .01$, S.E. $= .09$, $p = .95$) nor the mindfulness intervention ($b = -.03$, S.E. $= .12$, $p = .82$)

significantly predicted students' Fall GPA. Spring GPA was neither predicted by students'

gender ($b = -.01$, S.E. $= .11$, $p = .24$) nor the mindfulness intervention ($b = -.03$, S.E. $= .14$, $p =$

.85). Finally, cumulative GPA was neither predicted by students' gender ($b = -.08$, S.E. $= .08$, p

$= .35$) nor the mindfulness intervention ($b = -.02$, S.E. $= .10$, $p = .88$).

Table 17

Estimates from Multilevel Models Predicting Mindfulness, Stress, and Flourishing

Parameter	Mindfulness		Stress		Flourishing	
	Estimate	*SE*	Estimate	*SE*	Estimate	*SE*
	Fixed effects					
Intercept	-0.16	0.05	0.12	0.04	-0.03	0.05
Gender	0.03	0.08	0.02	0.06	-0.03	0.08
Group	-0.01	0.08	-0.01	0.06	-0.11	0.08
	Random effects					
Level 1 variance between:						
Students	0.49	0.04	0.23	0.02	0.46	0.03
Intercept variance between:						
Classes	0.01	0.01	0.01	0.01	0.00	0.00

Notes. Estimate for gender is for women compared to men. Estimate for group is for mindfulness sections compared to comparison sections. For retention, level 1 variance is fixed because it is a binary variable.

Table 18

Estimates from Multilevel Models Predicting GPA and Retention

Parameter	Fall GPA		Spring GPA		Cumulative GPA		Retention	
	Estimate	*SE*	Estimate	*SE*	Estimate	*SE*	Estimate	*SE*
Fixed effects								
Intercept	2.93	0.07	2.85	0.09	2.95	0.06	1.21	0.03
Gender	0.01	0.09	-0.13	0.11	-0.08	0.08	0.00	0.05
Group	-0.03	0.12	-0.03	0.14	-0.02	0.10	-0.01	0.05
Random effects								
Level 1 variance between: Students	0.56	0.04	0.81	0.07	0.45	0.04	—[a]	—[a]
Intercept variance between: Classes	0.05	0.03	0.06	0.42	0.03	0.02	0.00	0.00

Notes. Estimate for gender is for women compared to men. Estimate for group is for mindfulness sections compared to comparison sections.
[a]Level 1 variance is fixed because retention is a binary variable.

Because the treatment and comparison groups did not differ significantly, the author decided to analyze the differences between the pretest and the posttest scales to see whether 1) the latent variables differed between beginning and end of the semester and 2) whether those differences were significant. Table 19 shows that the means and standard deviations differ between time points and that each of those differences is significant. The importance of this information, as well as the implications and ideas for future research, are explored in chapter five.

Table 19

Paired-Samples t-Tests for Latent Variable Pretests and Posttests

		M	*N*	*SD*	*SE*	*p*
Pair 1	MAAS Pretest	4.02	373	.78	.04	.00
	MAAS Posttest	3.86	373	.88	.05	
Pair 2	PSS Pretest	1.85	373	.53	.03	.00
	PSS Posttest	1.97	373	.57	.03	
Pair 3	FS Pretest	5.93	373	.74	.04	.00
	FS Posttest	5.85	373	.95	.05	

$**p < .01$

Conclusion

In this fourth chapter, several statistical analyses were presented, including chi squared tests of independence, independent samples *t*-tests, Cronbach's coefficients alpha, bivariate Pearson's correlations, simple regressions, logistic regressions, intra-class correlations, multivariate models, and pair-samples *t*-tests. The chi squared tests found a significant difference between the number of men and women between the mindfulness and comparison groups, but no significant variations in any of the other demographic categories. The independent samples *t*-tests found no significant variances among the pretest variables between groups. Cronbach's coefficients alpha found all pretests and posttests to be reliable at greater than .80.

The bivariate Pearson's correlations found all pretest outcome variables of mindfulness, stress, and flourishing to be significantly related to one another, with stress negatively correlated to both mindfulness and flourishing, and mindfulness and flourishing positively correlated. Pearson's answered part of the first research question, which was to see how the latent variables were related to one another. The second part of the research question was to see how the latent variables were related to the observed variables GPA and retention. Simple regression analyses found that the only latent variable that significantly predicted GPA was flourishing at a 2.1% explanation of the variance. Logistic regression analyses found that the latent variables did not

126

significantly predict retention into the following Fall semester. Logistic regression analyses did find that GPA at all time points of Fall, Spring, and cumulative from Fall and Spring did significantly predict retention with 4.3%, 7.7%, and 2.8% of variances explained, respectively.

Though not part of the initial research question, posttest latent variables were run in a simple regression analysis with GPA to see if mindfulness, stress, and flourishing levels near the end of the Fall semester instead of at the beginning had predictive relationships with GPA. They were found to have significant predictive relationships with Fall GPA, with mindfulness explaining 1.4% of variances and stress explaining 4.2% of variances. Mindfulness, stress, and flourishing were found to significantly predict Spring GPA at 1.6%, 2.5%, and 3.5% variances explained, respectively. Mindfulness and stress were found to significantly predict cumulative GPA at 1.5% and 2.5% variances explained, respectively. The logistic regression for posttest latent variables and retention showed only a significant prediction of flourishing and retention at 3.2% variances explained.

For the second research question, intra-class correlations showed variances at the section level for GPAs across all time points; therefore, the decision was made to conduct a multilevel model to control for those variances. Students' gender was also included in the model since it varied significantly between the mindfulness and comparison groups. When controlling for class section and gender, the multilevel model showed no significant differences between the mindfulness groups in terms of mindfulness, stress, flourishing, GPA at any time point, or retention. Also not part of the initial research questions were the paired-samples t-tests to investigate overall differences in time points for all students. Since there were no significant differences between groups, the author wanted to see if the latent variables changed significantly in the posttest from the pretest. All three paired-samples t-tests showed significant changes.

Each of these statistical analyses was used to investigate the 2- to 5-minute mindfulness intervention. The next chapter will explore the interpretation of these findings, including limitation, and recommendations for future research and mindfulness interventions.

Chapter Five

Discussion

The effectiveness of mindfulness meditation, which began as a Buddhist meditation more than 2,500 years ago (Vago & Silberswig, 2012), has been reported in myriad studies, many of which are in educational research (Black & Fernando, 2014; Napoli, Krech, & Holley, 2005; Reid & Miller, 2009). Medically, mindfulness has been shown to alleviate chronic pain (Kabat-Zinn, 2013), treat autoimmune diseases such as lupus (Horesh, Glick, Taub, Agmon-Levin, & Shoenfeld, 2017), and improve psychological disorders (Gallego, Aguilar-Parra, Cangas, Langer & Mañas, 2014; Serpa, Taylor, & Tillisch, 2014; Song & Lindquist). In business, mindfulness has been shown to improve job satisfaction (Hülsheger, Alberts, Feinholdt, & Lang, 2013), decrease burnout (Fortney, Luchterband, Zakletskaia, Zgierska, & Rakel, 2013), and increase ethical decision-making (Ruedy & Schweitzer, 2010). In education, which is the area most pertinent to the current research study, mindfulness has been shown to improve ADHD behaviors (Napoli, Krech, & Holley, 2005), attention in students with generalized anxiety (Reid & Miller, 2009), emotional wellbeing (Viafora, Mathiesen, & Unsworth, 2015), and academic achievement (Waters, Barsky, Ridd, & Allen, 2015).

While mindfulness in college has been shown to improve students' mindfulness levels (Baer, 2009; Carmody & Baer, 2008; Shapiro, Carlson, Astin, & Freedman, 2006), stress levels (Cole et al., 2015; Ratanasiripong, Park, Ratanasiripong, & Kathalae, 2015), flourishing levels (Bohmeijer, Lamers, & Fledderus, 2015; Brown & Ryan, 2003; Feicht et al., 2013), and

academic achievement (Waters, Barsky, Ridd, & Allen, 2015), there has been little published research that investigates the impact that mindfulness meditations conducted in the college-level classroom has with retention. Further, while many mindfulness studies outline the dosage of their intervention (Horesh, Glick, Taub, Agmon-Levin, & Shoenfeld, 2017; Kabat-Zinn, 1982; Ramler, Tennison, Lynch, & Murphy, 2016), they often do not include discussion of the dosage as a factor. This omission leaves much ambiguity on the frequency and duration of the intervention. Because of this lack of specificity, researchers have called for more studies to explicitly address their treatments' dosage (Garland, Zhou, & Gonzales, 2016; Lam, 2016; Meiklejohn et al., 2012).

To investigate these issues, the author analyzed the data collected from a mindfulness intervention on first-year college students in a first-year experience seminar. The intervention took place for two to five minutes once a week for 10 weeks. Specifically, in the first research question the author looked at the relationship among the variables of mindfulness, stress, flourishing, and academic achievement in terms of GPA and retention. The author hypothesized that 1) as pretest mindfulness levels increased, pretest flourishing levels would increase and pretest stress levels would decrease; 2) GPA would increase as pretest mindfulness and flourishing increased and GPA would decrease as pretest stress increased; 3) retention odds would increase as GPA increased; and 4) retention odds would increase as pretest mindfulness and flourishing increased and retention odds would decrease as pretest stress increased.

In the second research question, the author looked at the differences in those variables between a group receiving the mindfulness treatment and a group not receiving any treatment. The author hypothesized that the group receiving the mindfulness treatment would have significantly higher mindfulness levels, flourishing levels, GPA, and retention and significantly

lower levels of stress. While dosage was not an initial research question, reporting on the timing of this study's brief mindfulness treatment will add further information to the literature.

Analysis of Research Question One

In order to test the first research question, the author ran bivariate Pearson's correlations for each pairing of the latent variables, simple regressions between each latent variable and GPA, logistic regressions between each latent variable and retention, and a logistic regression between GPA and retention. The Pearson results indicated that there indeed were significant correlations among all three latent variables. Specifically, mindfulness and flourishing were positively correlated, mindfulness and stress were negatively correlated, and flourishing and stress were negatively correlated, all at significance levels of $p < .01$. The simple regression results indicated that out of all the latent variables, only flourishing had a significant predictive relationship with Spring GPA, explaining 2.1% of data variances. Neither flourishing, mindfulness, nor stress had significant predictive relationships with any other GPA time point. The logistic regression results indicated that none of the latent variables had significant predictive relationships with retention; however, Fall, Spring, and cumulative GPA all had significant positive predictive relationships with retention, and Spring GPA having the highest percentage of explained variances at 7.7.

Relationships Among Mindfulness, Stress, and Flourishing

The results from the first research question support previous research as well as offer evidence in previously un-researched areas. First, mindfulness and stress have been extensively paired together in the research (Garland, Zhou, Gonzalez, & Rodriguez, 2016; Weinstein, Brown, & Ryan, 2009). For example, Khoury, Sharma, Rush, and Fournier's (2015) meta-analysis found that mindfulness decreased stress in 29 studies. In terms of the theoretical framework of mindfulness, being aware of thoughts and emotions that can trigger the stress

response improves top-down cognitions instead of getting swept into the spiral of physiological stress responses and ruminative thoughts (Creswell & Lindsay, 2014; Kiken & Shook, 2014). The current study's significant negative correlation result of mindfulness and stress supports the current literature showing that as one increases, so does the other.

Second, mindfulness and flourishing have been well studied since Brown and Ryan's (2003) seminal publication on mindfulness and psychological wellbeing (Feicht et al, 2013). Psychological wellbeing is also known as eudaimonic wellbeing, which is often described as flourishing (Diener et al., 2010). Since then, mindfulness has been associated with increased psychological flexibility (Bohlmeijer, Lamers, and Fledderus, 2015), life satisfaction (Brown & Ryan, 2003; Kong, Want, and Zhao, 2014), and subjective wellbeing (Shier and Graham, 2011), which are all elements of flourishing. The current study's significant positive correlation result of mindfulness and flourishing supports the current literature showing that as one increases, so does the other.

Finally, stress and flourishing have repeatedly been shown throughout the literature to be negatively correlated. For example, as flourishing increases, so does resilience to stress in the presence of life challenges (Ryff & Singer, 2003); students with higher life satisfaction tend to report lower stress (Holinka, 2015); and alternatively, those who are not flourishing have been shown to be more psychologically vulnerable to stress (Ong, Bergeman, Bisconti, & Wallace, 2006). Those with low psychological wellbeing are more susceptible to stress and more at risk for depression and anxiety (Morrison & O'Connor, 2005). Though psychological distress was not measured in the current study, flourishing—on the opposite end of the spectrum—was, and it is significantly negatively correlated with stress, as hypothesized. This finding supports current literature that shows that as stress increases, flourishing decreases.

Latent Variables' Relationships with Academic Achievement

Research on the relationships among the latent variables mindfulness, stress, and flourishing and the observed variables GPA and retention (i.e., academic achievement) run the gamut, but not necessarily at the college level. First, mindfulness and grades have previously been studied, but only at the K-12 level (Waters et al., 2015). Though meditation and grades have been studied in higher education, those studies have had major flaws. According to Shapiro, Brown, and Astin (2011), examples of flaws include small sample sizes and vague descriptions of the interventions. Other studies measured the relationships between GPA and mindfulness-related variables, like metacognitive awareness (Young & Fry, 2008) and academic self-efficacy (Hanley, Palejwala, Hanley, Canto, & Garland, 2015); however, few studies have specifically measured the students' mindfulness levels and their grades. One such study did show that students at a professional school who participated in mindfulness workshops achieved higher grades than students who did not (Rosenstrich & Margalit, 2015). In terms of retention, few studies discuss college retention when investigating mindfulness, and those that do have looked at retention indirectly (Melnyk, Kelly, Jacobson, Arcoleo, & Shaibi, 2014; Ramler, Tennison, Lynch, and Murphy, 2016). The current study looked at mindfulness levels at the beginning of the semester and their relationship to academic achievement at the end of the semester (Fall GPA), the end of the following semester (Spring GPA), and the end of the year (cumulative GPA) and retention in the following Fall semester. No significant relationships were found between students' mindfulness levels and their subsequent GPA or retention, which adds to the literature on mindfulness and academic success.

Second, stress and academic achievement in terms of GPA and retention have been extensively studied, and it is well accepted that students who are experiencing high levels of

stress earn lower grades (Akgun & Ciarrochi, 2003; Sohail, 2013; Veena, 2016) and have higher chances of attrition (Britt et al., 2017; Joo et al., 2008). While extensive research points to negative predictive relationships between stress and academic achievement in terms of GPA and retention, the current study's results show no significant predictive relationships between stress and either GPA or retention.

Third, research has shown that flourishing and academic achievement in terms of GPA and retention are strongly related (Datu, 2016; Schreiner, Pothoven, Nelson, & McIntosh, 2006), with evidence that the order of impact depends on the situation (Eisenberg, Golberstein, & Hunt, 2009). Specifically, students who rate high in flourishing and life satisfaction also tend to have higher grades (Datu, 2016; Schreiner, 2010) and persist at higher rates (Bean, 1983; DeWitz, Woolsey, & Walsh, 2009). The current study's results show that Fall semester flourishing levels have a significant positive predictive relationship with Spring GPA, yet not with Fall GPA, cumulative GPA, or retention; therefore, only the Spring GPA finding supports previous research.

Finally, the strong positive relationship between the distinct constructs of college GPA and retention is well documented throughout the literature (DeBerard, Spielmans, & Julka, 2004; Kern, Fagley, & Miller, 1998; Pritchard & Wilson, 2003). Further, researchers generally agree that college GPA is one of the strongest predictors of retention (DeBerard et al., 2004; Kern, Fagley, & Miller, 1998). The results of the current study support these findings, since Fall, Spring, and cumulative GPA all showed significant positive predictive relationships with retention.

Research Question Two

Before testing the second research question, the author conducted intra-class correlations (ICC) for all of the outcome variables to investigate whether there were variances at the class section level. The reason for looking at ICCs was because there were 35 different class sections participating in the study, and students were not randomly placed into them. Further, experiences in class can vary per instructor, and individual instructors' multiple classes can also vary; therefore, class section variances were investigated instead of instructor variances, as all instructors taught multiple sections.

After running an ICC for each variable, the only variables that showed significant variances across class sections were the three GPA time points. To control for these variances, the author decided to run a multilevel model (MLM). The author tested all outcome variables with the MLM because variances per group in students' gender were also found during the preliminary phase of the data analyses. There were significantly more women in the mindfulness intervention group than there were in the comparison group; therefore, students' gender was added to the MLM.

The MLM consisted of students at level one and class section at level two, and it controlled both for student's gender and group designation (i.e., treatment or comparison). The results of the MLM indicated that there were no significant differences between the mindfulness and comparison groups for any of the outcome variables: mindfulness, stress, flourishing, GPA at any time point, or retention. These insignificant results differed from much of the published literature as described next, and they add to the discussion on treatment dosage for mindfulness.

Previous literature reports that mindfulness training has significantly improved mindfulness levels (Baer, 2009; Carmody & Baer, 2008; Shapiro, Carlson, Astin, & Freedman,

2006), stress levels (Garland, Zhou, Gonzalez, & Rodriguez, 2016; Khoury, Sharma, Rush, and

Fournier, 2015; Weinstein, Brown, & Ryan, 2009), and flourishing levels (Bohlmeijer, Lamers,

Fledderus, 2015; Brown & Ryan, 2003; Feicht et al., 2013). The lack of previous data on the

relationships between mindfulness interventions and academic achievement in terms of GPA and

retention, however, prevents the current study's results from being directly compared with more

than a few studies, and those studies have mixed results. For example, neither Napora (2013),

Shao & Skarlicki (2009), nor Brausch (2011) found relationships between mindfulness and GPA.

Alternatively, other studies showed that mindfulness treatments have positive effects on

academic achievement (Rosentreich & Margalit, 2015; Sampl, Maran, & Furtner, 2017). With

regard to studies that investigate the impact of mindfulness-like constructs on academic

retention, Palejwala, Hanley, Canto, and Garland (2015) found that students with greater mindful

awareness had higher academic self-efficacy, which is connected to academic achievement.

Of interest to these results is the comparison of the current study's pretest stress levels

with the Cohen and Janicki-Deverts (2012) U.S. Census-based stress norms as measured by the

PSS-10. As shown in chapter four, the students in the current study had higher levels of stress

when compared to the rest of the country. This higher baseline-level of stress to that of the rest of

the country could explain the lack of response to the intervention. If this sample of students

started out more stressed, then they might require more than two to five minutes of mindfulness

per week to affect change.

The most probable reason for not seeing positive changes in the mindfulness group could

be that the dose of mindfulness was too small. One of the main According to Voils et al. (2012),

"Dosing is potentially the most important decision that must be made when building or refining

behavioral interventions" (p. 1225), and it should be operationally defined by duration,

frequency, and amount. Before the Voils et al. (2012) study, there was no standardization of dosing terminology or reporting in social science behavioral interventions. Mindfulness research has mixed reports of intervention details in terms of duration, frequency, *and* amount, making it difficult to replicate studies and to determine the minimum amount of mindfulness training necessary to affect the positive changes often reported. As discussed in the literature review in chapter two, there is no conclusive evidence thus far on the dosage of mindfulness (Garland, Zhou, & Gonzales, 2016).

The most frequently reported dosage is for the MBSR training, which has meetings once a week for eight weeks for two hours (Horesh, Glick, Taub, Agmon-Levin, & Shoenfeld, 2017; Ramler, Tennison, Lynch, & Murphy, 2016). This commonly accepted version of MBSR was reduced from the original 10 weeks created by Kabat-Zinn (1982). Though MBSR is noted as "brief" training programs, there are studies using shorter interventions that have also affected positive results. For example, Feicht et al.'s (2013) 7-week program ran online for 7 weeks with three 10-15 minute exercises per week. Subjective happiness and satisfaction increased significantly. Hartel, Nguyen, and Guzik's (2017) ran even shorter exercises at the beginning of class for the entire semester. They were only three-minute long guided meditations. The students provided overwhelmingly positive feedback; however, frequency of class meetings was not mentioned. Napora (2013) ran six-minute mindfulness sessions at the beginning of classes once a week for 15 weeks and found that mindfulness predicted GPA. While a deep study into the dosage problems in social science and mindfulness research is beyond the purview of this study, it is important to note that these brief training programs can have significant results similar to the those from the longer MBSR programs.

As is also a problem in social science research, there may be countless mindfulness studies that have been conducted but not reported due to "insignificant" findings, often referred to as the "file-drawer" problem (Creswell & Lindsay, 2014, p. 405; Rosenthal, 1979). The non-publishing of null results not only creates the issue of denying other researchers critical information that could prevent them from making similar "mistakes," but also in this case it prevents researchers and practitioners from determining what might be a dosage of mindfulness training that is not associated with change in behavior or cognition. The results of the current study did not reveal significant changes in mindfulness, stress, flourishing, or academic achievement, but in terms of dosage those results may be significant. As stated by previous researchers, dosage of mindfulness training is an area that requires further study (Garland, Zhou, & Gonzales, 2016; Lam, 2016).

These results from questions one and two led to additional questions about the timing of the assessment administrations, the statistical differences between the pretest and posttest outcome variables, and how this study may add to the literature in terms of minimum amounts of treatment dosage. These questions will be addressed in the post hoc analyses section, followed by the study's limitations, the results' implications, and the recommendations for future research.

Post Hoc Analyses

To answer the first research question, the latent variables mindfulness, stress, and flourishing were measured at the pretest administration, which took place on the first day of class for each section. The pretest results were used instead of posttest results in order to compare the students' base latent variable levels with GPA and retention before receiving the mindfulness intervention. Once it was evident that none of the variables differed between the mindfulness and comparison groups, the author tested the predictive relationships between the posttest latent

138

variables and the academic achievement variables in order to see whether those levels had significant predictive relationships. They did. Mindfulness levels at the end of the Fall semester positively predicted Fall ($p < .01$), Spring ($p < .05$), and cumulative GPA ($p < .01$). Stress levels at the end of the Fall semester significantly negatively predicted Fall ($p < .01$), Spring ($p < .05$), and cumulative GPA ($p < .01$).

Just as flourishing at the beginning of the Fall semester only had a significantly positive predictive relationship with Spring GPA ($p < .01$), flourishing at the end of the Fall semester only had a significantly positive predictive relationship with Spring GPA; this time at the significance level of $p < .01$. The only latent variable that had a significant predictive relationship with retention was flourishing, and it was positive at a significance of $p < .01$ and explained 3.2% of data variances. The findings of this post hoc analysis suggest that students' levels of mindfulness, stress, and flourishing at the end of their first semester of college have greater predictive relationships with GPA and retention than do levels measured at the beginning of their first semester of college.

After the combining of the treatment and comparison groups, paired-samples *t*-tests were run to see whether there were significant differences between pretest and posttest latent variables. The results showed that students had significantly lower levels of mindfulness ($p < .01$) and flourishing ($p < .05$) and significantly higher levels of stress ($p < .01$) at the end of the semester than they did at the beginning of the semester. One potential reason for this is that students at the beginning of the semester have yet to experience the college stressors and life challenges that they will face in the coming weeks and months. These significant findings support previous evidence that college is stressful and can impact students' wellbeing (Bowman, 2010; Keyes, 2006; Leppink, Odlaug, Lust, Christenson, & Grant, 2016; Low, 2011).

Additionally, previous research reports that students who do better academically and who persist in school have greater resilience (Hartley, 2010) and use more positive coping skills (Wilson, 2003). The current findings may help support studies like Hartley (2010) and Wilson (2003), suggesting that those who maintain or improve their levels of mindfulness and flourishing, while keeping their stress levels relatively low, have increased odds of persisting in college. This study's findings also provide evidence that discovering significant relationships between academic achievement and mindfulness, stress, and flourishing may depend on the time of the semester the data is collected.

Limitations

No study is without limitations. Limitations specific to this study include the research design, treatment fidelity, selection, instrumentation, and design contamination. This section will cover the details of these potential issues in terms of threats to validity and will address whether or not they caused major impediments to the study and contaminated the results.

Threats to Validity

Validity is the proximity of how close an inference is to truth based on the evidence, without the certainty of truth in a single study. Threats to validity are specific obstacles that lead inferences even farther away from the truth. The goal of research design was to minimize these threats so that the confidence of the inferences was as high as possible (Shadish, Cook, & Campbell, 2002). The research team that designed the intervention study took measures to reduce threats of internal and external validity as is described next.

Internal Validity. Internal validity is "the degree to which the study demonstrates that the treatment *caused* a change in behavior" (Mitchell & Jolley, 2013, p. 41). In other words, maximizing the internal validity of a study means being able to rule out as many other possible

causal explanations as possible. Even though the intervention study was not truly experimental, this definition applies because there was a manipulated independent variable (i.e., mindfulness intervention). The goal, then, was to see if it was the mindfulness intervention—and not any other factors—that relates to the dependent variables. The term *relate* is used here because it is impossible to infer causation in quasi-experimental studies since the groups may differ in infinite unknown ways.

The internal threats to the intervention study were sample size, selection, design contamination, instrumentation, treatment fidelity, and history. Sample size could have been an issue for the second research questions, because, although there were 373 students in the total sample, they were analyzed across 35 class sections. In controlling for the variations among class section, the sample size was reduced from 373 to 35, and 35 is a relatively small sample size and could point to low statistical power.

There was a problem with selection for both the instructors and the students. Instead of being randomly assigned to groups, instructors were asked to volunteer if they would like to provide the mindfulness intervention to their classes. An issue with this could be that instructors who volunteered may have done so because they already practice mindfulness, or they believe that it could help their students. That previous knowledge or belief could have been a factor that was not accounted for. Alternatively, though, the instructors who did not participate in the intervention group may have felt coerced and believed that not participating would negatively impact their performance evaluations—officially or subliminally. Either of these reasons for participating could be problematic. For example, while teachers who practice mindfulness may be more open and calm, and therefore have calmer classrooms or simply be less reactive to disruptive behavior (Albrecht, Albrecht, & Cohen, 2012), the instructors for this study were

neither exclusively selected for previous or current practice, nor were they randomized to balance this potential bias.

The same selection problem applies to the intervention instructors who may have only volunteered for fear of not participating. Instructors were notified that volunteering was truly optional and that participating or not participating would not be included in any official or unofficial evaluation; however, some may have inherently believed otherwise and consented to participate. The error or variances that the lack of random assignment of instructors could have created may have been accounted for in the ICC across class sections, but non-randomized selection is still a limitation that should be considered in future research studies. The design of this study, therefore, does not account for instructor influence as a potential factor or underlying variable.

The second major selection issue was the non-randomization of students to groups. Randomization could have been used had the mindfulness trainings been offered in workshops, but the purpose of the study was to see whether mindfulness trainings could be offered in the classroom as part of the curriculum. Because students had to fit the classes into their schedules, and because they had to take one of the class sections that their advisor was teaching, students could not be randomly placed into a UNIV 101 course. Further, it would have been unethical to randomize whether students took the class or not, since it is designed to improve their adjustment.

It is possible that design contamination impacted the results. First, students in the comparison group received the same pretest and posttest as the students in the mindfulness group received. The pretest asked questions such as "*Have you ever participated in mindfulness exercises,*" which could have informed students in the comparison section that they may not be

receiving a particular treatment that another group was receiving. While it also asked questions such as, "*How often do you participate in prayer*," it asked several other questions about prior experience with mindfulness. Future studies that gather similar data should consider adding other questions to conceal an obvious interest in mindfulness. Students who figure out that they are not receiving the treatment may become resentful, a feeling that could impact their assessment responses, intentionally or not. An additional design contamination possibility happened when one of the instructors mentioned to the class in her introduction of the posttest assessment administrator that they were part of the study but not receiving the mindfulness treatment. A recommendation for future intervention studies would be to include training for the comparison group instructors, too, so that they are instructed not to divulge to their classes that they are in the comparison group.

Instrumentation is a potential limitation to this study for several reasons. First, the assessments were relatively long at 48 questions on the pretest and 41 questions on the posttest, and the length could have had an order effect, such as test-taking fatigue. According to Czajkowski, Giergiczny, & Greene (2014),

> One way to minimize the effects of an anchoring, framing, or acting strategically is to use a counterbalanced design, that is, present each respondent with a difference ordering of choice tasks, such that the potential effects of, for example, starting point bias is canceled out for the sample. Counterbalancing…plays an important role in retrieving the underlying dynamics of ordering effects. (p. 326).

Specifically, test-taking fatigue would increase error. Counterbalancing the questions would decrease the chances for error, and it is a recommended strategy should this study be replicated.

The other instrumentation issue was the administrations of the pretest and posttest. Even though the eight research team members who administered the informed consent forms and the assessments received written and oral training, ensuring uniformity of the administrations was not possible. One class received more information than the other sections because the research team member answered a student's question. There were probably more instances like this that were not accounted for. Further, each team member had her own style of presenting, so students may have reacted differently to someone who was more energetic and friendly than to someone who simply read the instructions with more of a monotone voice. There were too many sections of the classes that met at the same time, so having all eight administrators was necessary; however, additional training on making the administrations more uniform would be recommended for future similar studies, as well as having the administrators report any instances that made particular administrations different.

Treatment fidelity may have been the limitation that most impacted the integrity of the study. While easily controlled in a laboratory setting, the treatment dosage and implementation becomes more difficult in educational settings because non-researchers are usually the ones who implement it. As stated by Hulleman & Cordray (2009), "Teachers may alter portions of the curriculum to better match their students' needs and therefore enhance its effectiveness, or they may change portions that require too much advanced preparation and therefore undermine its effectiveness" (p. 89). The instructors of this study's mindfulness sections attended a training session prior to the start of the semester, and they completed a survey at the conclusion of the semester that asked how often they played the mindfulness recordings to their classes. They were instructed to read a statement before every exercise that reminded students of the purpose of mindfulness, the recommended posture, and the required silence throughout the exercises so

those who wanted to participate could do so without interruption; however, it was unknown as to whether and to what extent they altered the statement and whether they truly did play the recordings each week. It was also unknown the extent to which they practiced mindfulness themselves and whether they believed it to be an effective practice for the students to learn. Including personal questions in the instructor survey would have made them participants, which was beyond the purview of the study. Including the instructors as participants is an area for future research.

Finally, history could have played a major role in impacting the results of this study. The data were collected in the Fall 2016 semester, when tensions were high over the presidential election. The posttest was collected during the twelfth week of the semester, which was one to two weeks after the election (Monday classes were a week behind the others due to the Labor Day holiday). It is likely that the win of Donald Trump caused many students distress. This university is in an urban setting, making it likely that the majority of the population identifies with the democratic party (Monnat & Brown, 2017). It is also a diverse institution, with many students belonging to one or more minority groups. Gonzalez, Ramirez, and Galupo (2018) found that their minority group of GLBT students were significantly more stressed following the 2016 election, due to discriminatory campaigns and lack of reconciliatory messages afterwards. It is possible that the students at the current study's university felt the same way. In fact, one of the instructors contacted the author to share that her students' moods were noticeably somber after the election. Other colleagues reported seeing students on campus crying. This stress may have overridden the impact of the brief mindfulness intervention by increasing students' stress levels, thereby negatively affecting their mindfulness and flourishing levels.

External Validity. External validity is the extent to which the results can be generalized "to different participants, places, and time periods" (Mitchell & Jolley, 2013, p. 55). The two areas of generalization concerns are to different participants and different settings. The external validity to the present study is restricted to first-year college students at VCU who elect to take UNIV 101, the main reason being because the participants were not randomized into groups. Because they were not randomized into groups, it was impossible to confirm that the variances between groups were equal. Furthermore, selection was based on participants' choosing to take the course. Even though students did not know mindfulness would possibly be an element of the curriculum, students who chose to take a class that would help them adjust to college may have had a commonality that made them inherently different from those who who chose not to take the class; therefore, the external validity was only generalizable for VCU students who elect to take UNIV 101.

Implications

This study aims to add to the literature on mindfulness and college students, and has many implications. The results provide implications for future mindfulness intervention research, higher education administrators, student affairs professionals, faculty, counselor educators, and counseling students. This section will explore the ways in which the results can be used in these areas.

In terms of research and practice, this study provides evidence that there is a minimum to the amount of mindfulness practice training that makes it effective. While these results do not confirm what the minimum might be, and while this non-randomized design cannot determine causal relationships, an inference is that training for two to five minutes once a week for 10 weeks is not enough mindfulness intervention to see improvements in mindfulness, stress,

146

flourishing, and academic achievement. The Napora (2013) mindfulness intervention ran for six minutes over 15 weeks and showed improvement in GPA; therefore, the authors estimates that the minimum effective intervention exists somewhere in between. As detailed in chapter two, a wealth of mindfulness research clearly supports that mindfulness improves all of these outcome areas. The current study suggests that perhaps there is a tipping point as to the amount of training a person receives to observe such improvements.

Another research implication is in regard to the findings of significant differences between the pretest and the posttest latent variables. These findings support other research that shows that many college students struggle emotionally and academically and experience decreased wellbeing (American College Health Association; Fall 2015; SAMHSA, 2017; Beiter et al., 2015; Gallagher, 2014; Morrison & O'Connor, 2005). It is hoped that the current study adds to this literature that calls for more work to be done not just to alleviate students' stress but also to help them thrive. Further, the current findings show that students who have higher levels of mindfulness and flourishing at the end of their first semester of college and lower levels of stress do better academically, while students who have higher levels of flourishing at the end of their first semester have increased odds of staying in school.

One implication of these findings is support for previous studies that show the positive effects of mindfulness and flourishing on grades, while increased stress predicts lower grades. A second implication is to add to the literature the significant predictability that end-of-first-semester flourishing levels have with retention into the following year. Stress, which is negatively correlated with flourishing, did not have a negative predictive relationship with retention, which might be evidence supporting Keyes' (2002) and Low's (2011) findings of the ability for flourishing and mental illness to coexist in the dual continua model, in which a person

can both have depression and be flourishing. While stress and depression are separate constructs, an implication of the current study may be that flourishing and stress can coexist. Further research would need to be done to investigate this notion.

Additionally, previous research reports that students who do better academically and who persist in school have greater resilience (Hartley, 2010) and use more positive coping skills (Wilson, 2003). The current findings may help support studies like Hartley (2010) and Wilson (2003), suggesting that those who maintain or improve their levels of mindfulness and flourishing, while keeping their stress levels relatively low, have increased odds of persisting in college. This study's findings also provide evidence that discovering significant relationships between academic achievement and mindfulness, stress, and flourishing may depend on the time of the semester the data is collected. Additional research would need to be done to determine how students fair during various points throughout the semester.

Administrators in higher education have an invested interest in retaining students. Colleges and universities must maintain a minimum number of students to remain financially stable, so when students leave they must recruit new students. The most cost effective solution is to keep the students who are already attending. This study has several implications that warrant administrators' attention. The first is the support for students' psychological wellbeing, which research shows can be enhanced through mindfulness. The second is support that grades and retention are significantly positively related, meaning that increased grades predict increased retention. The third is support that the outcome variables mindfulness, stress, and flourishing are all significantly correlated with grades; therefore, if grades and retention and strongly connected, administrators should want to do what they can to improve students' grades. While the current study does not show cause, it does show connection—and there is a significant connection

between each posttest outcome variable and grades at each time point. While it is unknown why all the outcome variables have predictive relationships with grades and only flourishing has a predictive relationship with retention, the relationships are worth noting in relation to retention.

More specifically, this and previous research shows that retention and grades are positively correlated with each other (DeBerard, Spielmans, & Julka, 2004; Pritchard & Wilson, 2003), that grades are positively correlated with mindfulness (Rosenstrich & Margalit, 2015) and flourishing (Datu, 2016; Schreiner, Pothoven, Nelson, & McIntosh, 2006), and that grades are negatively correlated with stress (Akgun & Ciarrochi, 2003; Sohail, 2013; Veena, 2016). The implication for higher education administrators, then, is to focus programming on increasing students' mindfulness and flourishing levels and decreasing their stress levels in hopes that students can improve or maintain their GPA and remain in school.

While the current study does not provide evidential support to past mindfulness studies' findings that mindfulness training often results in positive outcomes, chapter two's review of the literature and this study's list of limitations still offer support for higher education administrators to consider implementing mindfulness programs at their institutions. Though the current study's mindfulness intervention dosages were likely too small, many others have shown positive effects in educational settings; therefore, it is recommended that institutions of higher education offer mindfulness or mindfulness-related programs to better support their students' psychological wellbeing and academic achievement.

The implication of this study's finding that student wellbeing decreases significantly at the end of the first semester and stress increases not only support the well-accepted knowledge that college is stressful (Morrison & O'Connor, 2005), but it also supports the need for higher education administrators to address the issue that many students struggle psychologically during

149

their first semester of college and need more resources than campuses are currently equipped to provide (American College Health Association; Fall 2015; SAMHSA, 2017). Because college and university counseling centers are overwhelmed, understaffed, and under resourced (Beiter et al., 2015; Gallagher, 2014), administrators can offer programming to a greater number of students to offset their stress and increase their wellbeing. Programming options include mindfulness workshops and incorporating mindfulness training into class time.

Student affairs professionals and faculty are the individuals who often work most closely with students, so they can benefit from the current study as well, particularly because they are the ones who would be conducting the mindfulness workshops or incorporating a practice into their classes. One of the most important takeaways for these two groups is dosage of the intervention. Should an instructor decide to teach their class mindfulness, they should be aware that fewer than six minutes once a week might not be enough for observable benefits in terms of mindfulness, stress, flourishing, or academic achievement. Student affairs professionals who decide to run mindfulness training workshops that are separate from in-class versions may want to choose a version with well documented research supporting its effectiveness, like MBSR. Workshops generally run for eight weeks with one two-hour meeting per week.

The findings of the current study may also be useful to counselor educators who prepare entry-level counseling students in the Student Affairs and College Counseling track. This track is one of eight governed by the Council for the Accreditation of Counseling and Related Educational Programs (CACREP, 2016). It is likely that mindfulness has become part of the teaching curriculum in many programs' introduction to counseling theory courses, as it is included in Gerald Corey's (2017) staple textbook, *Theory and Practice of Counseling and Psychotherapy (10th ed.)*. As is also described in the present writing's chapter two, Corey (2017)

150

includes the four counseling therapies derived from mindfulness: Mindfulness-Based Stress Reduction (MBSR), Mindfulness-Based Cognitive Therapy (MBCT), Acceptance and Commitment Therapy (ACT), and Dialectical Behavior Therapy (DBT). All can be used at the college level. Counselor educators can use the current findings to show entry-level counseling students that mindfulness is a practice that may have negligible impact if not enough time or focus is spent on teaching it.

Other findings from this study could also be useful to counselor educators who teach future student affairs professionals and college counselors. For example, it is critical to know that student wellbeing often decreases during the first semester of college. Further, it is helpful to know that stress correlated negatively with mindfulness and flourishing and that it predicted higher grades when it was measured at the end of the semester, while mindfulness and flourishing were correlated positively with each other and predicted higher grades when they were measured at the end of the semester. Knowing this can help the future professionals plan student programming, classroom instruction, individual sessions, and group counseling sessions, particularly with the purpose of helping students improve their psychological wellbeing, grades, and odds of staying in school.

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Recommendations for Future Research

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The next main step after this study would be a replication study with a few adjustments. There were quite a few limitations that may have impacted the outcomes, particularly dosage, treatment fidelity, sample size, and design contamination. The author is interested in repeating the study to better control for these issues. Changes would include adding a treatment group that receives more of the intervention in order to test the duration, frequency, and amount of the mindfulness training in order to contribute more literature on treatment dosage. For example,

students could receive the same two to five minutes of mindfulness training at the beginning of class, but at the the beginning of a class that meets two or three times a week instead of one. Alternatively, the students could receive ten minutes of mindfulness training at the beginning of class once a week, thereby simply increasing by several minutes the current study's intervention. It is recommended that only one of these factors change at a time or that multiple treatment groups are used so that the roles of duration, frequency, and amount are distinguishable. Further, more class sections should be added to increase the statistical power.

Another change to a replication study would be to improve training for both the mindfulness and comparison group instructors. The mindfulness group instructors would receive more training than they did in the current study in order to improve treatment fidelity. The comparison group instructors would also receive training in order to reduce their chances of contaminating the design, for example, by telling their classes that they were the comparison or control group and not learning mindfulness. These future findings are important in determining whether incorporating a few minutes of mindfulness activities at the beginning of class can help buffer first-year students from stress while increasing their mindfulness levels, flourishing levels, and academic achievement in terms of GPA and retention.

In addition to the need for a replication study, the current study has inspired questions that warrant future research. First, future research should investigate why the correlations and predictive relationships between the latent and outcomes variables became significant at the end of the semester when they were not significant at the beginning. While a conjecture is that resilience or hardiness may be a contributing factor, research is needed in order to test that idea. For a study with a particular focus on timing, the author would like to increase the data collection time points to see whether there is a point in the semester when students' wellbeing declines to a

152

level of significant that predicts GPA. The increased time points across the semester will also help distinguish "state variability from trait change" (p. 172), and would be much more sensitive in determining the impact the 2016 election had on student's mindfulness, stress, and flourishing.

Second, it was interesting that while all three latent variables were significantly correlated with each other and with grades, and while grades and retention were significantly predictive of each other, flourishing was the only latent variable that predicted retention at either the pretest or the posttest administration. Further mediation research would need to be done to investigate why flourishing but not mindfulness or stress predicted whether students would remain in school or drop out, particularly when stress and psychological well-being have been strongly tied to each other in previous research (Morrison & O'Connor, 2005; Ong, Bergeman, Bisconti, & Wallace, 2006).

A third area for further investigation is mindfulness and college retention. One focus of the current study was to incorporate mindfulness into the classroom, which would reach more students than would inviting them to participate in non-curricular workshops; however, the workshops that teach mindfulness have well-established research supporting their positive influence on psychological health, with an improvement in flourishing and a lowering of stress (Bohlmeijer, Lamers, and Fledderus, 2015; Feicht et al., 2013). Considering that the current study shows that flourishing students had greater odds of being retained, further research should be conducted to see if college students who go through a mindfulness workshop such as MBSR have increased odds of remaining in school.

Finally, looking at the instructors' experiences experiences could be another recommended next step. While the current study only collected data from the intervention instructors in terms of frequency of implementation and the level of engagement of the students,

data on their experience of the process was not collected. There are other studies that look at teachers' experiences of running mindfulness in the classroom, but most exist at the K-12 level (Black & Fernando, 2015; Waters, Barsky, Ridd, & Allen, 2015). It is the current author's interest, therefore, to conduct future research that investigates the experiences college instructors have with running mindfulness activities in their classroom. It would be particularly interesting to see if beginning classes with mindfulness, which has been shown to improve children's attention and teacher's job satisfaction due to the improved classroom behavior (Black & Fernando, 2015), also improves student attention and instructor satisfaction at the college level, especially when upwards of 90% of students are distracted by their digital devices (McCoy, 2013).

Conclusion

The purpose of the present study was to investigate the relationships among a mindfulness intervention with first-year college students and their levels of mindfulness, stress, flourishing, and academic achievement in terms of GPA and retention. The study also explored the relationships among the outcome variables to see how they supported previous research and how the latent variables predicted academic achievement, particularly retention. The findings on the relationships between the mindfulness intervention and the outcome variables were not significant, meaning that no differences between the mindfulness and comparison groups were found. This finding was surprising given the many previous research studies on mindfulness programs, yet other "insignificant" findings may also exist yet have fallen victim to the "file-drawer" problem.

While the findings were statistically insignificant, they are still significant in terms of adding to the literature. As discussed earlier in this chapter, there are quite a few limitations that

154

may have impacted the results; however, the findings show that two to five minutes once a week for 10 weeks may not be not enough mindfulness exposure to influence statistically significant differences between those who receive the treatment and those who do not. A replication study that addresses the mentioned limitations would be necessary to see whether the dosage was too low or if the limitations were too problematic.

After not finding statistically significant differences between the mindfulness and comparison groups, the author tested the differences between the pretest and posttest latent variables and found the posttest mindfulness and flourishing levels to be significantly lower than the pretest levels. The author also found the posttest stress levels to be significantly higher than the pretest levels. This was an important finding because it provided additional evidence that college students are under much stress and experience decreases in psychological wellbeing. The finding also supports the need for more programming to be done at institutions of higher education to help college students be emotionally and academically successful.

Since there were no significant differences between the mindfulness and the comparison groups, it is possible that many of the limitations did not impact the results of the other tests that looked at the relationships among the latent variables and the differences between the pretest and the posttest. In regards to the differences between groups, however, the limitations could be quite problematic. Future research should be conducted not only to replicate the study with fewer of these limitations, but also to see whether more robust mindfulness interventions can make the difference in students' mindfulness levels, stress levels, flourishing levels, and academic achievement in terms of GPA and retention.

As an administrator in higher education, the author hopes to not only continue teaching mindfulness to college students, but also to increase awareness among faculty, staff, and other administrators that they can help contribute to students' psychological well-being. Much reliance is put on sending distressed students to the campus counseling centers, and while doing so is often necessary and a best practice, preventative work such as mindfulness programming as well as incorporating mindfulness in the classroom may help student maintain or even improve their psychological well-being. It is hoped that these efforts will normalize the necessary psychological care that must happen for college student, not just those put forth by the college students and the counseling centers, but also through all facets of institutions of higher educations.

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Appendix A

Informed Consent Form for Mindfulness Intervention Group

RESEARCH SUBJECT INFORMATION AND CONSENT FORM

TITLE: The Effects of Mindfulness in a First-Year Experience University Course

VCU IRB NO.: HM20007861

INVESTIGATOR: Elizabeth Bambacus

If any information contained in this consent form is not clear, please ask the study staff to explain any information that you do not fully understand. You may take home an unsigned copy of this consent form to think about or discuss with family or friends before making your decision.

PURPOSE OF THE STUDY
The purpose of this research study is to find out more about stress and college freshmen. Benefits of participating include helping researchers discover ways to help college freshmen reduce stress, increase wellbeing, and improve academics. Additional benefits include participating in activities that have been shown to improve these areas.

DESCRIPTION OF THE STUDY AND YOUR INVOLVEMENT
If you decide to be in this research study, you will be asked to sign this consent form after you have had all your questions answered.

In this study, you will be asked to attend every class meeting of this Introduction to the University (UNIV 101) course and arrive on time, which are also requirements of the course. At three times throughout the semester, you will be asked to complete a survey regarding relaxation and stress. You will not be asked to do anything outside normal class activities. Every UNIV 101 class will be part of this study, and the number of students per section varies. Overall, there are just under 1,000 students included in this study.

At the beginning of each class for ten weeks, your instructor will play a mindfulness activity for you to listen to and follow. The activities will vary among breathing exercises, guided meditations, guided visualizations, and body scans. In order to look at academic benefits, the

primary investigator will collect withdrawal and grade point average data at the end of the semester and academic year.

RISKS AND DISCOMFORTS
Sometimes relaxing the mind and taking surveys about stress or other items related to stress can bring up stressful or disturbing thoughts, feelings, or memories. Should this happen, you may contact VCU Student Counseling Services to speak with a professional. Their number is 804-828-6200.

CONFIDENTIALITY
Potentially identifiable information about you will consist of questionnaires and data that includes withdrawal numbers and grade point averages. Your questionnaire answers and the other data will be identified by your V-number, not your name. All identifying information will be kept in password protected files and these files will be destroyed after four years. The questionnaires will be kept in a locked file cabinet for up to one year after the study ends and will be destroyed at that time or sooner. After four years, the V-numbers will be replaced with random 4-digit numbers, leaving no identifiable information. Access to all data will be limited to study personnel. A data and safety monitoring plan is established.

We will not tell anyone the answers you give us; however, information from the study and the consent form signed by you may be looked at or copied for research or legal purposes by Virginia Commonwealth University. Personal information about you might be shared with or copied by authorized officials of the Department of Health and Human Services or other federal regulatory bodies.

VOLUNTARY PARTICIPATION AND WITHDRAWAL
Your participation in this study is voluntary. You may decide not to participate in this study. Your decision to take part or not to take part will not impact your grade, nor will there be any other penalties for choosing not to participate. If you do participate, you may freely withdraw from the study at any time without penalty. If you decide to withdraw from the study, contact the primary investigator listed below and your data will be destroyed.

If you choose not to participate in the study and do not want to participate in the activities, then you can sit quietly while the instructors plays them aloud on the computer. Due to the nature of the activities, sitting quietly will be indistinguishable from participating. If you are under the age of eighteen, you will not be able to sign this form and have your data collected; however, you are still welcome to participate in the activities.

Your participation in this study may be stopped at any time by the study staff without your consent. The reasons might include:
- the study staff thinks it necessary for your health or safety;
- you have not followed study instructions;
- administrative reasons require your withdrawal.

QUESTIONS

If you have any questions, complaints, or concerns about your participation in this research, contact:

Elizabeth Bambacus, Primary Investigator
804-827-3927; bambacuses@vcu.edu
and/or
Amanda McGann, Co-Investigator
804-828-6919; awmcgann@vcu.edu

The researcher/study staff named above is the best person(s) to call for questions about your participation in this study.

If you have any general questions about your rights as a participant in this or any other research, you may contact:

Office of Research
Virginia Commonwealth University
800 East Leigh Street, Suite 3000
P.O. Box 980568
Richmond, VA 23298
Telephone: (804) 827-2157

Contact this number to ask general questions, to obtain information or offer input, and to express concerns or complaints about research. You may also call this number if you cannot reach the research team or if you wish to talk with someone else. General information about participation in research studies can also be found at http://www.research.vcu.edu/human_research/volunteers.htm.

CONSENT

I have been given the chance to read this consent form. I understand the information about this study. Questions that I wanted to ask about the study have been answered. My signature says that I am willing to participate in this study. I will receive a copy of the consent form once I have agreed to participate.

_____

Participant name   printed Participant   signature   Date

_____
Name of Person Conducting Informed Consent Discussion
(Printed)

_____
Signature of Person Conducting Informed Consent Discussion   Date

_____
Principal Investigator Signature (if different from above)   Date

Appendix B

Informed Consent Form for Comparison Group

RESEARCH SUBJECT INFORMATION AND CONSENT FORM

TITLE: The Effects of Mindfulness in a First-Year Experience University Course

VCU IRB NO.: **HM20007861**

INVESTIGATOR: Elizabeth Bambacus

If any information contained in this consent form is not clear, please ask the study staff to explain any information that you do not fully understand. You may take home an unsigned copy of this consent form to think about or discuss with family or friends before making your decision.

PURPOSE OF THE STUDY
The purpose of this research study is to find out more about stress and college freshmen. Benefits of participating include helping researchers discover ways to help college freshmen reduce stress, increase wellbeing, and improve academics.

DESCRIPTION OF THE STUDY AND YOUR INVOLVEMENT
If you decide to be in this research study, you will be asked to sign this consent form after you have had all your questions answered.

In this study, you will be asked to attend every class meeting of this Introduction to the University (UNIV 101) course and arrive on time, which are also requirements of the course. At three times throughout the semester, you will be asked to complete a survey regarding relaxation and stress. You will not be asked to do anything outside normal class activities. Every UNIV 101 class will be part of this study, and the number of students per section varies. Overall, there are just under 1,000 students included in this study.

In order to look at academic changes, the primary investigator will collect withdrawal and grade point average data at the end of the semester and academic year.

RISKS AND DISCOMFORTS
Sometimes answering survey questions about stress and other items related to stress and relaxation can bring up stressful or disturbing thoughts, feelings, or emotions. Should this

happen, you may contact VCU Student Counseling Services to speak with a professional. Their number is 804-828-6200.

CONFIDENTIALITY
Potentially identifiable information about you will consist of questionnaires and data that includes withdrawal numbers and grade point averages. Your questionnaire answers and the other data will be identified by your V-number, not your name. All identifying information will be kept in password protected files and these files will be destroyed after four years. The questionnaires will be kept in a locked file cabinet for up to one year after the study ends and will be destroyed at that time or sooner. After four years, the V-numbers will be replaced with random 4-digit numbers, leaving no identifiable information. Access to all data will be limited to study personnel. A data and safety monitoring plan is established.

We will not tell anyone the answers you give us; however, information from the study and the consent form signed by you may be looked at or copied for research or legal purposes by Virginia Commonwealth University. Personal information about you might be shared with or copied by authorized officials of the Department of Health and Human Services or other federal regulatory bodies.

VOLUNTARY PARTICIPATION AND WITHDRAWAL
Your participation in this study is voluntary. You may decide not to participate in this study. Your decision to take part or not to take part will not impact your grade, nor will there be any other penalties for choosing not to participate. If you do participate, you may freely withdraw from the study at any time without penalty. If you decide to withdraw from the study, contact the primary investigator listed below and your data will be destroyed. If you are under the age of eighteen, you will not be able to sign this form and have your data collected.

Your participation in this study may be stopped at any time by the study staff without your consent. The reasons might include:
- the study staff thinks it necessary for your health or safety;
- you have not followed study instructions;
- administrative reasons require your withdrawal.

QUESTIONS
If you have any questions, complaints, or concerns about your participation in this research, contact:

Elizabeth Bambacus, Primary Investigator
804-827-3927; bambacuses@vcu.edu
and/or
Amanda McGann, Co-Investigator
804-828-6919; awmcgann@vcu.edu

The researcher/study staff named above is the best person(s) to call for questions about your participation in this study.

If you have any general questions about your rights as a participant in this or any other research, you may contact:

Office of Research
Virginia Commonwealth University
800 East Leigh Street, Suite 3000
P.O. Box 980568
Richmond, VA 23298
Telephone: (804) 827-2157

Contact this number to ask general questions, to obtain information or offer input, and to express concerns or complaints about research. You may also call this number if you cannot reach the research team or if you wish to talk with someone else. General information about participation in research studies can also be found at http://www.research.vcu.edu/human_research/volunteers.htm.

CONSENT

I have been given the chance to read this consent form. I understand the information about this study. Questions that I wanted to ask about the study have been answered. My signature says that I am willing to participate in this study. I will receive a copy of the consent form once I have agreed to participate.

_____

Participant name printed   Participant signature   Date

_____
Name of Person Conducting Informed Consent Discussion
(Printed)

_____
Signature of Person Conducting Informed Consent Discussion   Date

_____
Principal Investigator Signature (if different from above)   Date

Appendix C

Pretest Assessment for Mindfulness Intervention Study

V#: _____   Date: _____

Course Section #: _____   Group ID: _____

Instructor: _____

Demographics

Please circle the option that best applies.

1. What sex were you assigned at birth, such as on an original birth certificate?
    a. Female
    b. Male

2. Which term do you use to describe your gender identity?
    a. Woman
    b. Man
    c. Trans woman
    d. Trans man
    e. Genderqueer
    f. Another identity (please specify) _____

3. How do you usually describe yourself? (Circle all that apply)
    a. White
    b. Black
    c. Hispanic or Latino/a
    d. Asian or Pacific Islander
    e. American Indian, Alaskan Native, or Native Hawaiian
    f. Biracial or Multiracial
    g. Other

Day-to-Day Experiences

Instructions: Below is a collection of statements about your everyday experience. Using the 1-6 scale below, 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

4. I could be experiencing some emotion and not be conscious of it until some time later.
   1 2 3 4 5 6

5. I break or spill things because of carelessness, not paying attention, or thinking of something else.
   1 2 3 4 5 6

6. I find it difficult to stay focused on what's happening in the present.
   1 2 3 4 5 6

7. I tend to walk quickly to get where I'm going without paying attention to what I experience along the way.
   1 2 3 4 5 6

8. I tend not to notice feelings of physical tension or discomfort until they really grab my attention.
   1 2 3 4 5 6

9. I forget a person's name almost as soon as I've been told it for the first time.
   1 2 3 4 5 6

10. It seems I am "running on automatic," without much awareness of what I'm doing.
    1 2 3 4 5 6

11. I rush through activities without being really attentive to them.
    1 2 3 4 5 6

12. 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.
    1 2 3 4 5 6

13. I do jobs or tasks automatically, without being aware of what I'm doing.	1	2	3	4	5	6
14. I find myself listening to someone with one ear, doing something else at the same time.	1	2	3	4	5	6
15. I drive places on 'automatic pilot' and then wonder why I went there.	1	2	3	4	5	6
16. I find myself preoccupied with the future or the past.	1	2	3	4	5	6
17. I find myself doing things without paying attention.	1	2	3	4	5	6
18. I snack without being aware that I'm eating.	1	2	3	4	5	6

The questions in this scale ask you about your feelings and thoughts during the last month. In each case, you will be asked to indicate *how often* you felt or thought a certain way. Although some of the questions are similar, there are differences between them and you should treat each one as a separate question. The best approach is to answer each question fairly quickly. That is, don't try to count up the number of times you felt a particular way, but rather indicate the option that seems like a reasonable estimate.

Please note that the scale is in reverse order from the previous questions.

0	1	2	3	4
Never	Almost Never	Sometimes	Fairly often	Very often

19. In the last month, how often have you been upset because of something that happened unexpectedly?	0	1	2	3	4
20. In the last month, how often have you felt that you were unable to control the important things in your life?	0	1	2	3	4
21. In the last month, how often have you felt nervous and "stressed"?	0	1	2	3	4
22. In the last month, how often have you dealt successfully with irritating life hassles?	0	1	2	3	4

192

23. In the last month, how often have you felt that you were effectively coping with important changes that were occurring in your life? 0 1 2 3 4

24. In the last month, how often have you felt confident about your ability to handle your personal problems? 0 1 2 3 4

25. In the last month, how often have you felt that things were going your way? 0 1 2 3 4

26. In the last month, how often have you found that you could not cope with all the things that you had to do? 0 1 2 3 4

27. In the last month, how often have you been able to control irritations in your life? 0 1 2 3 4

28. In the past month, how often have you felt that you were on top of things? 0 1 2 3 4

29. In the last month, how often have you been angered because of things that happened that were outside of your control? 0 1 2 3 4

30. In the last month, how often have you found yourself thinking about things that you have to accomplish? 0 1 2 3 4

31. In the last month, how often have you been able to control the way you spend your time? 0 1 2 3 4

32. In the last month, how often have you felt difficulties were piling up so high that you could not overcome them? 0 1 2 3 4

Below are eight statements in which you may agree or disagree. Using the 1-7 scale below, indicate your agreement with each item by indicating that response for each statement. Please note the direction of the scale.

1	2	3	4	5	6	7
Strongly disagree	Disagree	Slightly disagree	Mixed or neither agree nor disagree	Slightly agree	Agree	Strongly agree

33. I lead a purposeful life 1 2 3 4 5 6 7

34. My social relationships are supportive and rewarding 1 2 3 4 5 6 7

35. I am engaged and interested in my daily activities   1   2   3   4   5   6   7

36. I actively contribute to the happiness and well-being   1   2   3   4   5   6   7
    of others

37. I am competent and capable in the activities that are 1   2   3   4   5   6   7
    important to me

38. I am a good person and live a good life   1   2   3   4   5   6   7

39. I am optimistic about my future   1   2   3   4   5   6   7

40. People respect me   1   2   3   4   5   6   7

For the following questions, please indicate your previous experiences with mindfulness.

41. Have you ever read or watched something about mindfulness meditation?
    a. Yes
    b. No
    c. Unsure

42. Have you ever been taught mindfulness meditation?
    a. Yes
    b. No
    c. Unsure

43. Have you ever participated in mindfulness exercises?
    a. Yes
    b. No
    c. Unsure

44. How often do you practice mindfulness exercises or meditation?
    a. Daily
    b. Several times a week
    c. Once a week
    d. Once a month
    e. Rarely
    f. Never

45. How often do you participate in prayer?
    a. Daily
    b. Several times a week
    c. Once a week
    d. Once a month
    e. Rarely
    f. Never

46. How often do you participate in a mindful spiritual practice (other than prayer)?
    a. Daily
    b. Several times a week
    c. Once a week
    d. Once a month
    e. Rarely
    f. Never

47. How often do you practice yoga?
    a. Daily
    b. Several times a week
    c. Once a week
    d. Once a month
    e. Rarely
    f. Never

Appendix D

Posttest Assessment for Mindfulness Intervention Study

V#: _____   Date: _____

Course Section #: _____   Group ID: _____

Instructor: _____

Day-to-Day Experiences

Instructions: Below is a collection of statements about your everyday experience. Using the 1-6 scale below, 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.   1   2   3   4   5   6

2. I break or spill things because of carelessness, not paying attention, or thinking of something else.   1   2   3   4   5   6

3. I find it difficult to stay focused on what's happening in the present.   1   2   3   4   5   6

4. I tend to walk quickly to get where I'm going without paying attention to what I experience along the way.   1   2   3   4   5   6

5. I tend not to notice feelings of physical tension or   1   2   3   4   5   6

196

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.   1 2 3 4 5 6

7. It seems I am "running on automatic," without much awareness of what I'm doing.   1 2 3 4 5 6

8. I rush through activities without being really attentive to them.   1 2 3 4 5 6

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.   1 2 3 4 5 6

10. I do jobs or tasks automatically, without being aware of what I'm doing.   1 2 3 4 5 6

11. I find myself listening to someone with one ear, doing something else at the same time.   1 2 3 4 5 6

12. I drive places on 'automatic pilot' and then wonder why I went there.   1 2 3 4 5 6

13. I find myself preoccupied with the future or the past.   1 2 3 4 5 6

14. I find myself doing things without paying attention.   1 2 3 4 5 6

15. I snack without being aware that I'm eating.   1 2 3 4 5 6

The questions in this scale ask you about your feelings and thoughts during the last month. In each case, you will be asked to indicate *how often* you felt or thought a certain way. Although some of the questions are similar, there are differences between them and you should treat each one as a separate question. The best approach is to answer each question fairly quickly. That is, don't try to count up the number of times you felt a particular way, but rather indicate the option that seems like a reasonable estimate.

Please note that the scale is in reverse order from the previous questions.

0	1	2	3	4
Never	Almost Never	Sometimes	Fairly often	Very often

16. In the last month, how often have you been upset because of something that happened unexpectedly?   0   1   2   3   4

17. In the last month, how often have you felt that you were unable to control the important things in your life?   0   1   2   3   4

18. In the last month, how often have you felt nervous and "stressed"?   0   1   2   3   4

19. In the last month, how often have you dealt successfully with irritating life hassles?   0   1   2   3   4

20. In the last month, how often have you felt that you were effectively coping with important changes that were occurring in your life?   0   1   2   3   4

21. In the last month, how often have you felt confident about your ability to handle your personal problems?   0   1   2   3   4

22. In the last month, how often have you felt that things were going your way?   0   1   2   3   4

23. In the last month, how often have you found that you could not cope with all the things that you had to do?   0   1   2   3   4

24. In the last month, how often have you been able to control irritations in your life?   0   1   2   3   4

25. In the past month, how often have you felt that you were on top of things?   0   1   2   3   4

26. In the last month, how often have you been angered because   0   1   2   3   4

of things that happened that were outside of your control?

27. In the last month, how often have you found yourself thinking about things that you have to accomplish?   0   1   2   3   4

28. In the last month, how often have you been able to control the way you spend your time?   0   1   2   3   4

29. In the last month, how often have you felt difficulties were piling up so high that you could not overcome them?   0   1   2   3   4

Below are eight statements in which you may agree or disagree. Using the 1-7 scale below, indicate your agreement with each item by indicating that response for each statement. Please note the direction of the scale.

1	2	3	4	5	6	7
Strongly disagree	Disagree	Slightly disagree	Mixed or neither agree nor disagree	Slightly agree	Agree	Strongly agree

30. I lead a purposeful life   1   2   3   4   5   6   7

31. My social relationships are supportive and rewarding   1   2   3   4   5   6   7

32. I am engaged and interested in my daily activities   1   2   3   4   5   6   7

33. I actively contribute to the happiness and well-being of others   1   2   3   4   5   6   7

34. I am competent and capable in the activities that are important to me   1   2   3   4   5   6   7

35. I am a good person and live a good life   1   2   3   4   5   6   7

36. I am optimistic about my future   1   2   3   4   5   6   7

37. People respect me   1   2   3   4   5   6   7

For the following questions, please indicate your participation with mindfulness

38. How often have you done the meditations at the beginning of class?
   a. All
   b. More than half
   c. Half
   d. Less than half
   e. Never

39. Since the beginning of this semester, how often do you practice mindfulness outside of class?
   a. Daily
   b. Multiple times a week
   c. Once a week
   d. Once a month
   e. Never

40. Do you want to continue practicing mindfulness after this course ends?
   a. Yes
   b. No
   c. Unsure

41. What is the likelihood of you continuing to practice mindfulness after this course ends?
   a. Very likely
   b. Likely
   c. Somewhat likely
   d. Not at all likely

Appendix E

Instructor Survey

The following questions are not evaluative and will not be seen by anyone other than the research team. The answers will be used to see the effectiveness of beginning classes with a brief mindfulness exercise.

1. Name:

2. Course section:

3. How often were students in this section shown a 2-5-minute mindfulness exercise?
    a. Every week
    b. More than half of the class meetings
    c. About half of the class meetings
    d. Less than half of the class meetings
    e. Never

4. How do you feel that students responded to the mindfulness activities?
    a. All were engaged
    b. Most were engaged
    c. About half were engaged
    d. Less than half were engaged
    e. None was engaged

5. Describe how the mindfulness exercises impacted your stress levels:
    a. My stress levels improved drastically
    b. My stress levels improved somewhat
    c. My stress levels remained the same
    d. My stress levels worsened

6. Describe how the mindfulness exercises impacted your engagement in the class?
    a. My engagement improved drastically
    b. My engagement improved somewhat
    c. My engagement remained the same
    d. My engagement worsened

7. On average, how many students per week would you say walked in during or after the mindfulness exercises?
   a. No students entered late
   b. 1-2 students entered late
   c. 3-5 students entered late
   d. More than 5 students entered late

Appendix F

Mindfulness Activities for UNIV 101

Mindfulness Activities for UNIV 101

Please choose among the options below to play at the beginning of your UNIV 101 classes. Be sure to first read the introduction passage below.

Read Before Each Mindfulness Exercise
"We will now begin class with a few minutes of mindfulness. As a reminder, mindfulness is the practice of maintaining complete awareness of your thoughts, emotions, and experiences in the present moment without judging them. It is natural that your mind will wander. When it does, notice it without judging, and then bring your attention back to the present moment. It is your choice whether or not to participate in the mindfulness activity. All that is required is that you sit quietly so your classmates who do want to participate are allowed to do so without disturbances. If you would like to practice outside of class, you can find a list of resources on Blackboard. Please make sure all electronic devices are silenced and out of sight. You will want to sit upright in your chair, relaxed, with your feet flat on the ground and your hands resting comfortably on your lap. Let's begin."

Calm.com
- Body Scan (3 mins; https://www.calm.com/session/OHbpEy7JiB)
- Body Scan (5 mins; https://www.calm.com/session/cXBQRAMvFV)

YouTube
- Visual Mindfulness (2 mins; https://www.youtube.com/watch?v=b5Hw-6HzLPM)
- Meditation focused on relaxation (2½ mins; https://www.youtube.com/watch?v=rLXM-HC_69g)
- Mindfulness Guided Meditation (3 mins; https://www.youtube.com/watch?v=evJHBLldMsE)
- Free Your Mind - Letting Go (3½ mins; (https://www.youtube.com/watch?v=rSrSemQUeSI)
- The Breathing Space: Jon Kabat-Zinn (4 mins; https://www.youtube.com/watch?v=iZIjDtHUsR0)
- The Five-Minute Miracle (5½ mins; https://www.youtube.com/watch?v=utfw-rJUvy4)
- Five-Minute Calming Meditation (5½ mins; https://www.youtube.com/watch?v=i50ZAs7v9es)

VCU Artfulness (ALT Lab)
- 1 - Breathing (4 mins)*
- 2 - Guided Meditation (4 mins)*
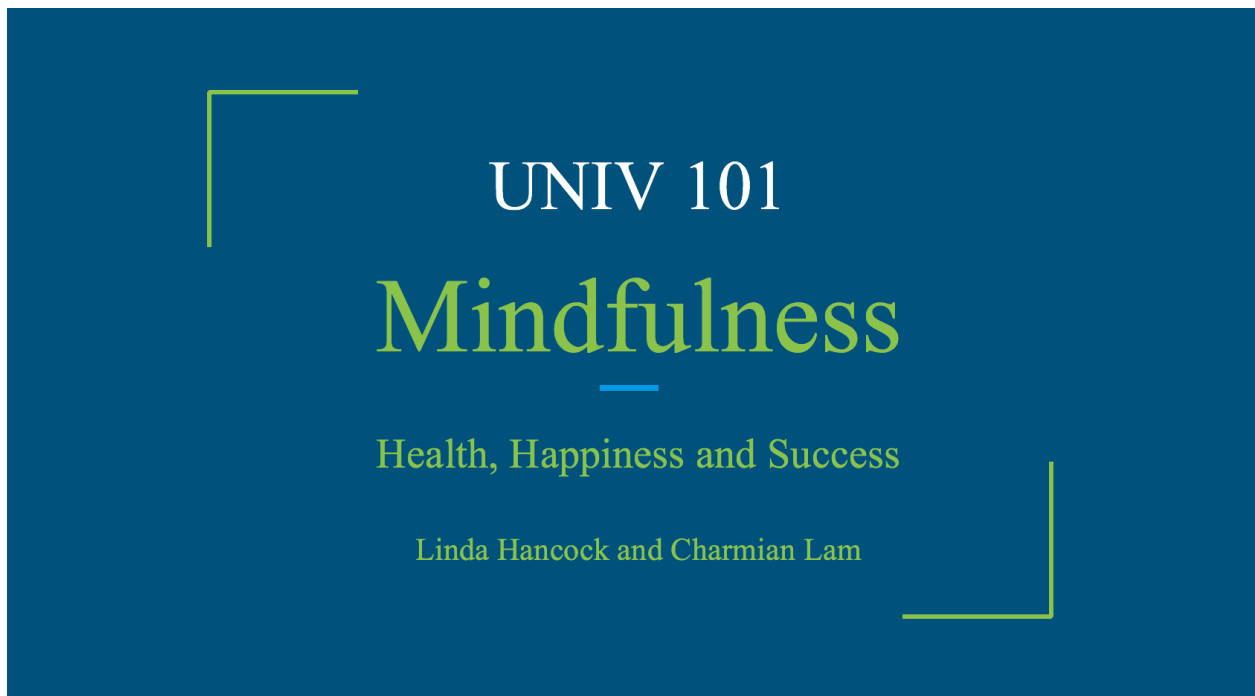- 5 - Guided Meditation (4½ mins)*
- More posted https://soundcloud.com/vcualtlab/

UCLA Guided Meditations
- Body and Sound Meditation (3 mins; http://marc.ucla.edu/mpeg/Body-Sound-Meditation.mp3)
- Body Scan Meditation (3 mins; http://marc.ucla.edu/mpeg/Body-Scan-Meditation.mp3)
- Breathing Meditation (5 mins; http://marc.ucla.edu/mpeg/01_Breathing_Meditation.mp3)

*Link no longer works

Appendix G

Mindfulness Presentation for UNIV 101

UNIV 101
Mindfulness

Health, Happiness and Success

Linda Hancock and Charmian Lam

What makes someone successful?

Harvard research study (Moffit, 2010) followed 1,000 people birth to age 32 and evaluated "What predicts health and wealth?" *(In other words success)*

FINDINGS

It wasn't race, language, SES, their scores on standardized tests, or IQ;

It was **SELF CONTROL**.

Those who succeeded, who had good careers, financial stability, loving relationships and physical health could focus, pay attention and regulate emotions.

In other words, they had the skills that come from mindfulness!

Key components of mindfulness

"Paying attention,

on purpose,

in the present moment,

non-judgmentally"

-Jon Kabat-Zinn, PhD

Our goal:
To help you be happy and successful at VCU!

Mindfulness not only decreases anxiety/stress, **practice** helps you learn that:

you are NOT your thoughts

you are NOT your emotions

you are the AWARENESS that can notice thoughts and emotions!

Mindful people learn how to RESPOND wisely rather than REACT.

Why mindfulness is a SUPERPOWER!   By Dan Harris   Happify

https://www.youtube.com/watch?v=w6T02g5hnT4

Meditation is ONE type of Mindfulness Practice

Examples of MINDFUL PRACTICES:

Meditation (With or without an app or guided meditation)

Stop. Breathe. Be. (Just a few deep breaths and returning the NOW)

Exercising mindfully.

Eating mindfully.

MindBody classes - Yoga, TaiChi, etc

We are all dinosaurs

Elementary students are being taught MINDFULNESS SKILLS!

In this next short video, 7-year-olds who have had mindfulness skills training share what they have learned.

As you watch...

Notice how they recognize their body's reflexive response to stress.

Notice the skills they have for responding rather than reacting.

Just Breathe by Salzman, Mindful Schools

https://www.youtube.com/watch?v=RVA2N6tX2cg

Different strokes for different folks.

If you want more information on mindfulness
    -about resources on or off campus
    -about mindfulness apps/websites
    -about the science of mindfulness

Check the link on blackboard

You don't have to practice outside of class, but if you want to, go for it!

For each class

Please be on time. Your professor will take roll at the start.

If you choose not to practice that's okay but please be quiet so others can.

Turn off your cell and put it away.

You body responds reflexively. How you sit matters.

Most effective posture: sit up straight, both feet on the floor, relax your shoulders, close your eyes, and just breathe slowly.

Enjoy!

Vita

Elizabeth Sterling Bambacus was born on November 1, 1983, in Richmond, Virginia, and is an American citizen. She graduated from Fuqua School in Farmville, Virginia, in 2002. She received her Bachelor of Arts in English with a double major in psychology from Virginia Commonwealth University, Richmond, Virginia, in 2007. She received her Master of Education in Counselor Education in the College Student Development and Counseling track from Virginia Commonwealth University in 2011, where she then worked as an academic advisor to first-year undergraduate students until 2015 when she was promoted to senior academic advisor. She earned her Post-Master's Certificate in Professional Counseling from Virginia Commonwealth University in 2014. Since 2016 she has been the Student Engagement and Summer Studies Administrator at Virginia Commonwealth University.